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SKYDIVER'S INFORMATION MANUAL
跳伞者信息手册
2023-2024

2023-2024 SKYDIVER'S INFORMATION MANUAL 跳伞者信息手册

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Pete Collies flies through a hoop held by Jack Schafer and Diana Kruchten at Skydive Milwaukee/Sky Knights Sport Parachute Club in East Troy, Wisconsin.
Pete Collies 穿过由 Jack Schafer 和 Diana Kruchten 握着的呼啦圈。照片摄于威斯康辛州 East Troy 村的跳伞俱乐部 Skydive Milwaukee/Sky Knights Sport Parachute Club。

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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。

The Translation Team
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导言 INTRODUCTION

A.PURPOSE AND SCOPE OF THE USPA SKYDIVER'S INFORMATION MANUAL
「美国跳伞协会（USPA）跳伞者信息手册（SIM）的目的和内容范围」

The Skydiver's Information Manual (SIM) provides basic skydiving standards (the Basic Safety Requirements) and recommendations agreed upon by USPA members 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）制定了基本的跳伞标准（即 BSR，基本安全要求），以及 USPA 会员们就如何安全地享受跳伞所达成的一致建议。手册还介绍了 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 produced 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、其他信息媒介，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。

B. THE SIM AND SKYDIVING'S SELF-POLICING PRINCIPLE OF REGULATION
「跳伞者信息手册（SIM）与跳伞的自律监管原则」

Although USPA is a voluntary membership association with no regulatory power, 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 (BSRs) 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、奖章、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（BSR）。基本安全要求（BSR）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.

本手册中的建议是指导性的，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。

C. HOW TO OBTAIN OR RECOMMEND CHANGES TO THIS MANUAL
「如何获取本手册或对本手册提出修改建议」

The SIM from time to time requires updating. It is the responsibility of SIM holders to keep their version current. New copies may be downloaded free of charge from the USPA website, www.uspa.org, or purchased from the USPA Store: (540) 604-9740; 604-9741 (fax), or email membership@uspa.org.

跳伞者信息手册（SIM）会不时进行更新。手册持有人有责任获取最新版本。最新的手册可从 USPA 网站（www.uspa.org）免费下载，或从 USPA 商店购买：电话（540）604-9740；传真 604-9741，电子邮箱 membership@uspa.org。

Readers are encouraged to submit comments or recommended changes in writing to USPA, 5401 Southpoint Centre Blvd., Fredericksburg, VA 22407; by phone to (540) 604-9740; by fax to 604-9741; or by email to uspa@uspa.org.
我们鼓励读者向 USPA 反馈评价或提出修改建议；收件地址：USPA, 5401 Southpoint Centre Blvd., Fredericksburg, VA，邮编 22407；电话（540）604-9740；传真 604-9741；电子邮箱 uspa@uspa.org。

This manual provides procedure to address many foreseeable situations, but each situation is different. Deviations from these recommendations does 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。

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。

THE FOLLOWING INFORMATION IS PRESENTED AS A MEMBERSHIP SERVICE BY THE UNITED STATES PARACHUTE ASSOCIATION (USPA). USPA MAKES NO WARRANTIES OR REPRESENTATIONS AND ASSUMES NO LIABILITY CONCERNING THE VALIDITY OF ANY ADVICE, OPINION OR RECOMMENDATION EXPRESSED IN THIS MATERIAL. ALL INDIVIDUALS RELYING ON THIS MATERIAL DO SO AT THEIR OWN RISK.
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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. **USPA, AS A PRIVATE, NON-REGULATORY ORGANIZATION WHICH HAS NO LEGAL AUTHORITY TO REGULATE OR CONTROL INDIVIDUALS OR CORPORATIONS, CANNOT BE HELD LIABLE FOR ANY JUMP OR TRAINING OPERATIONS THAT RESULT IN INJURY OR DEATH TO ANY PARTY.** 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.
个人安全可以通过采取适当的预防措施和程序来提高。本手册包含了美国跳伞协会（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（USPA）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。**USPA 作为一个私营、非监管组织，对个人或公司没有任何监管或控制权限，对任何产生伤亡的跳伞或跳伞训练，USPA 不承担任何责任。**无论 USPA 在什么出版物上做出了什么声明，USPA 既没有被赋予任何责任，也不对任何人承担任何责任。USPA 不对任何人的跳伞活动负有任何义务。USPA 提及的任何有关“自律”的表述，指的是个人对自身的管理，抑或说对其自身负责。USPA 签发各种执照、评级、奖章和任命，并提供各种类型的信息、建议和培训，但不授权任何人以任何身份代表 USPA，或作为代理人，代理其对跳伞活动进行监管或控制。

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.
为了对跳伞过程中的必要动作和程序有更透彻的了解，从而安全地跳伞，每位学生都有责任提出任何其认为有必要了解的问题。每位跳伞者都有责任进行一定的练习并采取一定的动作以维护自身和他人的安全。

USPA MAKES NO WARRANTIES, EXPRESSED OR IMPLIED, AS TO THE INFORMATION SET FORTH IN THIS

MANUAL. PEOPLE RELYING THEREON DO SO AT THEIR OWN RISK.
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目录 CONTENTS

导言 INTRODUCTION **I**

警告 WARNING **III**

目录 CONTENTS **V**

USPA 价值观声明 USPA VALUES STATEMENT **VII**

第一章 美国跳伞协会 THE UNITED STATES PARACHUTE ASSOCIATION **1**

美国跳伞协会（概述） THE UNITED STATES PARACHUTE ASSOCIATION (OVERVIEW) 2

第二章 基本安全要求和基本安全要求的豁免 BASIC SAFETY REQUIREMENTS AND WAIVERS **4**

基本安全要求和基本安全要求的豁免（概述） BASIC SAFETY REQUIREMENTS AND WAIVERS (OVERVIEW) 5

2-1 基本安全要求 BASIC SAFETY REQUIREMENTS 7

2-2 基本安全要求的豁免 WAIVERS TO THE BASIC SAFETY REQUIREMENTS 16

第三章 跳伞者的分类 CLASSIFICATION OF SKYDIVERS **18**

3-1 USPA 执照 USPA LICENSES 19

3-2 执照考试和申请流程 LICENSE EXAM AND APPLICATION PROCEDURES 25

3-3 评级 RATINGS 29

第四章 USPA 综合学生计划 USPA INTEGRATED STUDENT PROGRAM **31**

4-1 学生技能和知识集 STUDENT SKILL AND KNOWLEDGE SETS 33

4-2 A 单元至 H 单元目标概述 CATEGORIES A-H OBJECTIVES OVERVIEW 35

4-3 USPA 综合学生计划简介 USPA INTEGRATED STUDENT PROGRAM: AN INTRODUCTION 37

4-A A 单元 CATEGORY A 41

4-B B 单元 CATEGORY B 74

4-C C 单元 CATEGORY C 87

4-D D 单元 CATEGORY D 108

4-E E 单元 CATEGORY E 124

4-F F 单元 CATEGORY F 143

4-G G 单元 CATEGORY G 157

4-H H 单元 CATEGORY H 173

第五章 一般性建议 GENERAL RECOMMENDATIONS **184**

5-1 跳伞紧急情况 SKYDIVING EMERGENCIES 185

5-2 复训 CURRENCY TRAINING 200

5-3 装备 EQUIPMENT 202

5-4 跳前安全检查和简报 PRE-JUMP SAFETY CHECKS AND BRIEFINGS 213

5-5 天气 WEATHER 219

5-6 飞机 AIRCRAFT 221

5-7 看点定位 SPOTTING 223

5-8 事件报告 INCIDENT REPORTS 226

第六章 进阶 ADVANCED PROGRESSION **229**

6-1 团体自由落体（跳伞编队）GROUP FREEFALL (RELATIVE WORK) 231

6-2 自由飞、自由式和空中滑板 FREEFLYING, FREESTYLE AND SKYSURFING 233

6-3 自由落体下降速度和时间表 FREEFALL RATE OF DESCENT AND TIME TABLE 238

6-4 夜间跳伞 NIGHT JUMPS 240
6-5 水上降落 WATER LANDINGS 245
6-6 降落伞编队 CANOPY FORMATIONS 250
6-7 高海拔和氧气使用 HIGH ALTITUDE AND OXYGEN USE 257
6-8 带相机跳伞的建议 CAMERA FLYING RECOMMENDATIONS 267
6-9 首次翼装飞行课程（FFC）教学大纲 WINGSUIT FIRST FLIGHT COURSE (FFC) SYLLABUS 275
6-10 降落伞控制基础 CANOPY FLIGHT FUNDAMENTALS 290
6-11 高级降落伞控制主题 ADVANCED CANOPY PILOTING TOPICS 296
6-12 涉及大范围水平移动的自由落体 MOVEMENT JUMPS 315
6-13 高速自由落体 SPEED SKYDIVING 322

第七章 跳伞表演和评级 EXHIBITION JUMPING AND RATING 327

7-1 跳伞表演 EXHIBITION JUMPING 328
7-2 专业表演评级 PROFESSIONAL EXHIBITION RATING 337
7-3 联邦航空局 7711-2 表格的填写说明 INSTRUCTIONS FOR COMPLETING FAA FORM 7711-2 345

第八章 会员奖励计划 MEMBERSHIP AWARDS PROGRAMS 347

8-1 服务奖 SERVICE AWARDS 349
8-2 成就奖 ACHIEVEMENT AWARDS 376
8-3 能力表现奖 PERFORMANCE AWARDS 378
8-4 资深会员证书 MEMBERSHIP TENURE CERTIFICATES 380
8-5 运动精神奖 SPORTSMANSHIP AWARD 381

第九章 联邦航空局文件 FAA DOCUMENTS 382

9-1 联邦航空条例 FEDERAL AVIATION REGULATIONS 384
9-2 咨询通告 ADVISORY CIRCULARS 428
9-3 联邦航空局空中交通公报 FAA AIR TRAFFIC BULLETINS 467

名词解释 GLOSSARY 471

附录 A：自由落体手势 FREEFALL HAND SIGNALS 507

附录 B：USPA 单元测验答案 USPA CATEGORY QUIZ ANSWERS 508

附录 C：USPA 执照学习指南 USPA LICENSE STUDY GUIDE 517

USPA 价值观声明 USPA VALUES STATEMENT

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 Governance Manual Section 1-9.

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

第一章 美国跳伞协会

THE UNITED STATES PARACHUTE ASSOCIATION

SECTION SUMMARY「章节摘要」

The United States Parachute Association is a membership organization, incorporated as a not-for-profit association, such that each regular member has an equal vote and an equal voice in establishing the policies of the Association.
美国跳伞协会（USPA）是一个非盈利的会员组织，每位正式会员在制定协会政策方面都有平等的投票权和发言权。

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 USA.
在运动方面，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.
在管理方面，USPA 是联邦航空局（FAA）正式承认的美国跳伞者的代表。

USPA is an organization of skydivers, run by skydivers for skydivers, and it is your voice in skydiving. USPA keeps skydivers skydiving.
USPA 是跳伞者的组织，由跳伞者运行，为跳伞者运行，它代表您为跳伞运动发声，让跳伞者能够一直享受跳伞。

WHO NEEDS THIS SECTION?「本章节面向的受众」

- anyone first getting acquainted with USPA 「任何第一次接触 USPA 的人」

美国跳伞协会（概述） The United States Parachute Association (Overview)

A. YOUR USPA REPRESENTATIVES「你的 USPA 代表」

USPA Regional Directors are jumpers from your region of the country and are elected by you (and the other members within your region) to the USPA Board every three years. There are 14 USPA Regions and, therefore, 14 USPA Regional Directors. The USPA Board also includes eight National Directors, elected by the USPA membership at large.
USPA 的区域经理是来自美国不同地区的跳伞者，并由您（以及您所在地区的其他会员）投票选出至 USPA 董事会，选举每三年进行一次。USPA 将美国划分为 14 个地区，因此总共有 14 位 USPA 区域经理。USPA 董事会还包括 8 名全国性经理，由 USPA 全体会员选举产生。

Nearly all drop zones have at least one USPA S&TA who is appointed by and serves as your direct link to your USPA Regional Director. The S&TA is a local jumper who is available on your drop zone to provide you with 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），安全和培训顾问由 USPA 区域经理任命，他（她）是您与 USPA 区域经理的沟通桥梁。安全和培训顾问是您所在跳伞基地的当地跳伞者，可以为您提供管理服务和信息。

B. USPA LEADERSHIP「USPA 领导层」

The members of the USPA Board elect officers, including a president, vice president, secretary, treasurer, and chair of the board. The officers, together with an additional member-at-large, also elected from among the USPA Board members, make up the USPA Executive Committee. The Executive Committee is responsible for making decisions and taking care of important matters that arise between the USPA Board meetings.
USPA 董事会成员选举管理人员，包括总裁、副总裁、秘书、财务主管和董事会主席。这些官员和另外一名从 USPA 董事会成员中选出的普通成员组成了 USPA 执行委员会。执行委员会负责做出决定，并处理 USPA 董事会会议休会期间出现的重要事项。

C. USPA POLICY MAKING「USPA 政策制定」

The USPA Board of Directors establishes USPA policies and procedures during meetings held twice a year. The board operates through a committee system comprised of USPA Board members with special qualifications and interests. Each of the committees provide guidance and advice in major areas of activity within the sport.
USPA 董事会在每年举行两次的会议上制定政策和程序。董事会通过委员会系统运行，这个系统由具有特殊资格和利益的 USPA 董事会成员组成。各委员会为跳伞运动的各主要领域提供指导和建议。

The actions of each working committee must be approved by the full USPA Board before becoming USPA policy. Each USPA Director has one vote at USPA Board meetings. Voting responsibility includes not only making business decisions and setting policy, but also the establishment and modification of the Basic Safety Requirements and official USPA Recommendations. USPA Board members cast their votes based on the input they receive from their constituency (the membership) and their own judgment.
在成为 USPA 政策之前，各委员会的行动必须得到 USPA 董事会全体的批准。每位 USPA 经理在 USPA 董事会会议上有一票的投票权。投票责任不仅包括制定业务决策和制定政策，还包括建立和修改基本安全要求（BSR）和 USPA 官方建议。USPA 董事会成员根据其选区（会员）的意见和他们自己的判断进行投票。

D. THE USPA HEADQUARTERS STAFF「USPA 总部员工」

Between the meetings of the USPA Board, held twice each year, USPA's administrative staff conducts the day-to- day business of the organization. The USPA Board hires the Executive Director, who assumes all the various responsibilities and duties assigned by the USPA Board. The Executive Director, in turn, hires the staff, which operates from USPA Headquarters, in Fredericksburg, Virginia.

在每年举行两次的 USPA 董事会会议之间，USPA 的管理人员负责组织的日常事务。USPA 董事会聘请执行董事来承担 USPA 董事会安排的各项职责。执行董事则为位于弗吉尼亚州弗雷德里克斯堡的 USPA 总部雇佣员工。

In summary, USPA Headquarters, led by the Executive Director, serves the USPA membership and carries out the instructions and policies set by the Board of Directors.
总而言之，USPA 总部由执行董事领导，为 USPA 会员提供服务，并执行董事会制定的指令和政策。

E. USPA CONSTITUTION AND BY-LAWS「USPA 章程和细则」

USPA operates under a constitution and by-laws that define the organization's purpose. They are contained in the USPA Governance Manual, available 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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第二章 基本安全要求和基本安全要求的豁免

BASIC SAFETY REQUIREMENTS AND WAIVERS

SECTION SUMMARY「章节摘要」

Skydiving is based on the Basic Safety Requirements (BSRs) that have been established as the cornerstone of a self-policing principle. The BSRs 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, to establish a justifiable basis to modify these standards. This section includes two fundamental, interrelated USPA publications: the Basic Safety Requirements and Waivers to the Basic Safety Requirements.

跳伞运动是以基本安全要求（BSR）为基础的，这些安全要求是自我监管原则的基石。基本安全要求是公认的行业标准，它是为达到足够的必要的安全水平而制定的标准。人们可以研究如何在基本安全要求的范围内制定的新方法和程序，必要时可根据基本安全要求的豁免情形去修改这些标准。本章节包含了两个相互关联的 USPA 基本出版内容：基本安全要求，以及基本安全要求的豁免。

WHO NEEDS THIS SECTION?「本章节面向的受众」

- jumpers studying for license tests「正在准备执照考试的跳伞者」
- USPA instructional rating candidates「USPA 教学评级申请人」
- drop zone staff responsible for setting policies「负责制定跳伞基地规则的工作人员」
- USPA officials「USPA 官员」

基本安全要求和基本安全要求的豁免（概述）

Basic Safety Requirements and Waivers (Overview)

A. HOW THE BSRS AFFECT SAFETY 「基本安全要求与跳伞安全」

1. The BSRs promote practices aimed at eliminating incidents in skydiving and, by doing so, make skydiving safer and more enjoyable.
   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。
2. The BSRs are established by evaluating incidents and identifying their root causes.
   基本安全要求是通过对事故的评估以及对事故根本原因的分析而建立的。
3. 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：
   a. 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
   b. 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
   c. evaluate the risk factors
      评估风险因素
   d. accurately evaluate personal capabilities and limitations
      准确评估个人能力和局限
   e. stay alert and aware of surroundings
      保持警惕并注意周围环境
   f. keep options open
      保持对各种选项的开放态度
   g. exercise good judgment
      有良好的判断力
4. 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基本安全要求的修订」

1. Also included in this section, “Waivers to the Basic Safety Requirements” describes procedures for approving and documenting exceptions to the BSRs.
   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：
   a. Waivers provide for the responsible development of new techniques and methods.
      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。
   b. 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。
   c. 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。
   d. Waiverability
      豁免权限
      (1) Each BSR is categorized for the level of authority necessary for the approval of the waiver.
          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。

(2) 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).
除了附注有[S]（代指安全和培训顾问或考官）或[E]（代指执行委员会）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。

2. The BSRs are changed from time to time by the USPA Board of Directors 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 in Section 2-2.
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旁边标注了[S]或[E]，表明其可由第 2-2 节所示的其他人批准。

A. APPLICABILITY「适用性」

1. These procedures are applicable worldwide, apply to all jumps except those made under military orders, or 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 either 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 BSR when instructing student skydivers. Compliance with these procedures is mandatory and will protect the best interests of both the participants and the general public.
   基本安全要求适用于世界各地除军事跳伞或机内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。合规要求是强制的，这将保护跳伞参与者自身的利益和大众的利益。
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。[FAR 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 in Section 4-3.
      同意第 4-3 节中 USPA 推荐的健康声明。
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 air sport 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 chairman of 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 豁免申请表格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 that are a member of their own national aero club.
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 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 初级教练进行。
   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，在能够展示他（她）"有能力在两次故意扰乱姿态的动作之后（包括背朝大地的情形）5 秒内仍能回到稳定姿态和保持朝向"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 初级教练或 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.
在学生能够展示他（她）"有能力在两次故意扰乱姿态的动作之后（包括背朝大地的情形）5 秒内仍能回到稳定姿态和保持朝向"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（教练保护程序）」

(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“有能力在两次故意扰乱姿态的动作之后（包括背朝大地的情形）5 秒内仍能回到稳定姿态和保持朝向”。

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 hand-held 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，无论设备在哪个人身上）之前，必须至少有 200 次双人伞跳伞经验。

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，必须能够单独出舱，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 [S] 「学习团体自由落体的学生[S]」

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 初级教练或 D 执照持有者，在 USPA 教练的监督下进行，且：

b. The maximum group size allowed for any group skydive is four if that group includes any solo students cleared for self-supervision. The solo student must have successfully demonstrated the skills of ISP Category G. There must be at least one instructor, coach or D-license holder (that has been approved by an S&TA) for each student involved.
如果团体中包括任何被允许自我监督的单人跳伞学生，那么团体的人数上限是 4 人。且学生必须通过综合学生计划 G 单元的技能要求。每位学生需要至少一名教练，初级教练或 D 执照持有者（获得安全和培训顾问的批准）的陪同。

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 [S]「风[S]」

Maximum ground winds「地面最大风速限制」

1. For all solo students
   所有（非双人伞培训方法的）单人跳伞学生（Solo Student）
   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
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：电话和输电线、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. Waivers to landing areas that do not meet the minimum radial distance to the nearest hazard requirement, as prescribed in 2-1.J.1, may be approved by the Regional Director and the USPA Director of Safety and Training. These areas may be non-circular and similar in square footage to those prescribed in section 2-1.J.1.
离最近的危险障碍物的最小径向距离不符合 2-1.J.1 的要求的降落区对该项要求的豁免申请需得到区域经理以及 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 2-1.J.1 的要求。
4. 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、区域经理的指导下进行。
2. Pre-planned breakaway jumps are to be made by only class C- and D-license holders using FAA TSO'ed equipment. [E]
只有 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）装备进行包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，须要已开伞的跳伞者和进行自由落体的跳伞者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（FAR 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)
一顶坚固的头盔（除双人伞学生外）

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]
当预定的离机、开伞或着陆点距离开阔水域（开阔水域的定义是跳伞员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」

1. The Basic Safety Requirements represent commonly accepted standards necessary to promote safety in average conditions.
   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。
2. Since these standards may be an unnecessary burden in some individual circumstances, USPA provides procedures to document exceptions, known as waivers to the BSRs.
   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。
3. These waivers also provide for the responsible research and development of improved techniques and methods.
   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」

1. 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：
   a. the USPA S&TA or USPA Examiner
      USPA 安全和培训顾问或 USPA 考官
   b. the Executive Committee of USPA
      USPA 执行委员会
   c. full Board of Directors of USPA
      USPA 董事会全体成员
2. 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。
3. 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：
   a. S&TA or Examiner only [S]
      仅安全和培训顾问或考官[S]
   b. 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」

1. 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。
2. Inspections
   检查
   a. The person(s) filing the waiver should make periodic inspections to ensure that safety is not being compromised and to determine if the waiver should be rescinded.
      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。
   b. In the case of waivers by the Executive Committee, the Regional Director will perform these inspections and make recommendations to the Board.
      执行委员会的豁免将由区域经理负责检查并向董事会提出建议。
3. Form of waiver
   豁免申请表
   a. 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.

除 2-1.I.4 中的开伞高度例外外，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，应使用 uspa.org 上下载的表格。

b. A copy of the waiver will be sent to both the USPA Regional Director and USPA Headquarters.
豁免申请表的副本将同时发送给 USPA 区域经理和 USPA 总部。

c. 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.
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。

d. 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.
开伞高度的豁免不需要书面通知 USPA 总部或区域经理，但安全和培训顾问应将其记录在案。

4. S&TAs are not to file waivers for skydiving activities outside their assigned area.
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。

5. 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.
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。

6. The Executive Committee or full 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 区域经理，执行委员会或董事会全体成员不得批准豁免。

7. Any waivers filed by S&TAs or Examiners must specify a location with a copy to USPA Headquarters and the USPA Regional Director for that location.
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 区域经理。

8. 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.
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经理撤销该豁免。

D. FILING OF WAIVERS「豁免申请表的提交」

1. Persons filing waivers will maintain permanent records of all waivers filed by themselves.
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。

   a. The S&TA and Regional Director will maintain permanent records of all waivers filed for skydiving activities within their area.
   安全和培训顾问与区域经理应永久保存其所在地区内所有豁免申请记录。

   b. The records will be kept in such a manner as to indicate those waivers currently in effect and those that have been rescinded.
   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。

2. USPA Headquarters will maintain a permanent record of all waivers.
USPA 总部将永久保留所有豁免记录。

第三章 跳伞者的分类

CLASSIFICATION OF SKYDIVERS

SECTION SUMMARY「章节摘要」

Skydivers can qualify for and receive a variety of licenses and ratings according to their experience, skill, and knowledge level.
跳伞者可以根据其经验、技能和知识水平获得各种执照和评级。

USPA Licenses are essentially documents of proficiency and are divided into four classes from the lowest to highest levels: A, B, C, and D.
USPA 执照本质上是熟练程度的证明，从最低到最高分为四个等级：A、B、C 和 D。

Many skydivers also pursue ratings, which require qualifications in addition to those required for licenses. Three separate types of ratings can be obtained as an individual develops expertise in a specific area, such as student instruction, professional demonstration jumping, and competition judging. The FAA issues certificates for riggers, pilots, and aircraft mechanics, which may be of interest to skydivers.
许多跳伞者还追求评级。除了执照要求的资质外，这些评级还要求具备额外的资质水平。有三种不同类型的评级：教练、专业跳伞表演、竞赛裁判。联邦航空局则为降落伞装备师（Riggers）、飞行员（Pilots）和飞行器机械师（Aircraft Mechanics）签发证书，跳伞者也可能对这些证书感兴趣。

This section of the SIM describes the requirements and privileges of USPA licenses. For more details on the USPA instructional ratings, see the USPA Instructional Rating Manual. For the USPA PRO Exhibition rating, see SIM Section 7, “Exhibition Jumping.” For information on competition judging, see the USPA Skydiver’s Competition Manual. And for FAA ratings, refer to the FAA documents included in this manual.
这一章节描述了 USPA 执照的要求和权利。关于 USPA 教学评级的更多信息，请参阅 USPA 教学评级手册（IRM）。关于 USPA 专业跳伞表演的信息，请见第七章“跳伞表演与评级”。关于竞赛裁判的信息，请参阅 USPA 跳伞者比赛手册。关于联邦航空局的评级，请参阅本手册中包含的 FAA 文件。

IMPORTANT REFERENCE NUMBERS「重要参考内容指引」

- license requirements and privileges—3-1.E 「执照要求和权利-3-1.E」
- license exam instructions—3-2.A 「执照考试指导-3-2.A」
- application checklist—3-2.C 「申请检查表-3-2.C」

WHO NEEDS THIS SECTION?「谁需要这部分」

- jumpers seeking licenses 「想考执照的跳伞者」
- USPA officials certifying license applications and administering license exams
  「认证执照申请和管理执照考试的 USPA 官员」

3-1 USPA 执照 USPA Licenses

A. BACKGROUND「背景」

1. License requirements are intended to encourage the development of the knowledge and skills that should be acquired by each skydiver as experience is gained.
   为执照设定要求是为了鼓励知识和技能的发展，随着经验增加，这些知识和技能是跳伞者应获得的。
2. USPA licenses, recognized in all FAI member countries, serve as official documentation that the stated experience and skills have been attained.
   USPA 执照被所有 FAI 成员国认可，是跳伞经历和技能的官方证明。
3. Licenses are a valuable instructional tool in that they serve both as goals to be accomplished and as a guideline to acquire the skills and knowledge necessary to provide a reasonable level of safety and enjoyment.
   执照是一个非常有用的指引，因为它们既是一个待实现的目标，也是获得必要技能和知识的指南，从而提供合理的安全水平和享受。
4. USPA license authority「USPA 执照签发机构」
   a. The United States Parachute Association is authorized by the National Aeronautic Association and the Fédération Aéronautique Internationale to issue internationally recognized parachutist Certificates of Proficiency issued as A-D licenses.
      美国跳伞协会由美国国家航空协会和国际航空运动联合会授权签发国际公认的跳伞者技能熟练度证明，即 A 执照至 D 执照。
   b. Licenses are issued based upon demonstration of skill, knowledge, and experience and are ranked according to the level of accomplishment.
      执照基于跳伞者展示的技能、知识和经验水平签发，并根据成就水平进行评级。

B. GENERAL CONDITIONS FOR LICENSES「执照的一般条件」

1. USPA licenses are valid only while the holder is a current regular USPA member or a current temporary USPA member; there is no other renewal requirement.
   USPA 执照仅在跳伞者持有当前有效的 USPA 正式会员或 USPA 临时会员时有效；无其他续期要求。
2. USPA ratings are only valid while the holder is a current regular USPA member.
   USPA 评级仅在持有者是当前 USPA 正式会员时有效。
3. 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 执照在所有 FAI 成员国均有效，有效执照的持有人有权参加在 FAI 成员国组织的公开跳伞活动。
4. USPA issues licenses only to USPA members who meet the conditions set forth for that license.
   USPA 只向符合许可条件的 USPA 成员签发执照。
5. License qualifications made during military training jumps and all the dive flows and ground training requirements outlined in the USPA ISP must be properly recorded on the USPA A license progression card or higher license application for that USPA license and verified by the appropriate USPA official.
   在军事训练跳伞期间满足的执照申请资格，以及所有满足 USPA 综合学生计划中所列要求的跳伞流程和地面培训，必须适当记录在 A 执照进度卡或更高级别执照的申请中，并由合适的 USPA 官员核实。
6. Total freefall time is defined to include both freefall and droguefall time.
   自由落体总时间包括自由落体时间和带减速伞下降时间。
7. Static line and IAD jumps count towards jump numbers needed for licenses and ratings.
   Static Line 和 IAD 跳伞的跳数可计入获取执照或评级所需的跳数范围内。
8. USPA licenses may be refused, suspended, or revoked only when authorized by the USPA Board of Directors or in compliance with existing USPA Board directives.
   只有在 USPA 董事会授权或在符合现有 USPA 董事会指示的情况下，USPA 执照方可被否决、暂停或撤销。

C. LOGGING JUMPS FOR LICENSES AND RATINGS「为执照和评级而记录跳伞日志」

1. Skydives offered as evidence of qualification must have been:
   对作为资格证明的跳伞经历有以下要求：
   a. made in accordance with the USPA requirements in effect at the time of the jump
      这些跳伞经历应遵守跳伞当时有效的 USPA 要求
   b. legibly recorded in chronological order in an appropriate log that contains the following information:
      这些跳伞经历应按时间顺序清楚地记录在合适的跳伞日志中，且包含以下信息：
      (1) jump number「跳伞次数编号」
      (2) date「日期」
      (3) location「位置」
      (4) exit altitude「离机高度」
      (5) freefall length (time)「自由落体时间长度」
      (6) type of jump (formation skydiving, freeflying, canopy formation, style, etc.)
      「跳伞类型（编队跳伞、自由飞、降落伞编队、风格等）」
      (7) landing distance from the target「与着陆目标的距离」
      (8) equipment used「使用的装备」
      (9) 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」
2. Jumps to meet the number of jumps requirements for USPA licenses and ratings must be signed by a witness of the jump who may be another licensed skydiver, pilot, Instructor, Examiner, S&TA, or board member.
   为满足 USPA 执照和评级的跳数要求而进行的跳伞必须由见证了跳伞的持有执照的跳伞者、飞行员、教练、考官、安全和培训顾问或董事会成员签名确认。
3. Jumps to meet skill requirements must be signed by a Coach, Instructor, Examiner, S&TA, or Board member. Special requirements and additional qualifying items needed for Examiner ratings such as FJCs, air evaluations, ground evaluations, and teaching requirements must be logged and signed by an Examiner.
   为满足技能要求而进行的跳伞必须由初级教练、教练、考官、安全和培训顾问或 USPA 董事会成员签名确认。考官评级所需的特殊要求和额外资格，例如第一跳课程、空中评估、地面评估、教学要求，必须得到记录，并由 USPA 考官签名确认。
4. Use of digital devices for logging skydives
   使用数字设备记录跳伞
   a. Many skydivers use digital devices to log skydives, instead of traditional paper logbooks.
      许多跳伞者使用数字设备记录跳伞，而不是传统的纸质日志。
   b. Any jump logged in a digital device must contain the required information, including a signature verification from a licensed skydiver, the pilot, or a USPA National or FAI Judge who witnessed the skydive.
      在数字设备中记录的任何跳伞都必须包含所需的信息，包括来自持证跳伞者、飞行员或见证跳伞的 USPA 国家赛事裁判或 FAI 裁判的签名验证。
   c. Each instructor, S&TA or Examiner who verifies license requirements for a USPA license must review and verify the jumps logged in a digital device.
      每位验证 USPA 执照要求的教练，或安全和培训顾问、考官都必须检查并验证数字设备中记录的跳伞。
   d. For skydivers who are pursuing licenses and ratings, it is especially critical that the first 500 jumps are clearly logged and easily verifiable by the officials who must verify the jumps for licenses and ratings.
      对于追求执照和评级的跳伞者来说，尤其重要的是，前 500 次跳伞必须清楚地记录在案，并且易于被那些须对执照和等级进行审核的官员核实。

D. VERIFICATION OF APPLICATION「申请的核实」

1. 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.
   经历的确认：认证官员应验证跳伞次数和总自由落体时间是否正确，并符合所申请执照的要求。
2. Skill verification: Jump numbers, scores, or date(s) of completion require the initials of a current USPA Instructor, S&TA, Examiner, or USPA Board member.
   技能的确认：跳伞次数、分数或完成日期需要当前 USPA 教练，或安全和培训顾问、考官、 USPA 董事会成员的名称首字母签名缩写确认。
3. Except for jumps to meet the number of jump requirements; all jumps needed to meet requirements for licenses or ratings must be signed by an Instructor, Examiner, S&TA, or board member. Special requirements and additional qualifying items needed for an Examiner ratings such as FJCs, air evaluations, ground evaluations, and teaching requirements must be logged and signed by the S&TA, Examiner, or board member.
   除了用于满足跳数要求的跳伞，所有用于满足执照和评级要求的跳伞必须由教练、考官、安全和培训顾问或董事会成员签名确认。考官评级所需的特殊要求和额外资格，例如第一跳课程、空中评估、地面评估、教学要求，必须得到记录，并由安全和培训顾问、USPA 董事会成员或考官签名确认。
4. Signature Verification: Applications for all licenses must be signed by an appropriate official (as listed in this Section) before the application is forwarded to USPA Headquarters.
   签名验证：所有执照的申请在转发至 USPA 总部之前，必须由相应的官员（如本节中所列）签署。
   a. USPA Instructors may verify A, B, and C licenses.
      USPA 教练可以验证 A、B 和 C 执照。
   b. S&TAs, Examiners, and USPA Board members may verify any license application.
      安全和培训顾问、考官和 USPA 董事会成员可以验证任何执照的申请。
5. Every USPA B license must also include a completed and signed copy of the Canopy Piloting Proficiency Card.
   每个 USPA B 执照还必须包括一份填写完整的和已签名的降落伞控制熟练程度卡的副本。
6. The completed Canopy Proficiency Card must be signed by a current USPA S&TA, Examiner, or board member.
   填妥的降落伞控制熟练程度卡必须由持有有效资格的 USPA 安全和培训顾问、考官或董事会成员签字。
   a. The S&TA must ensure that a qualified course director conducts the training in this section.
      安全和培训顾问必须确保有资格的课程主管进行本节的培训。
   b. 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.
      在某些情况下，教授该内容的最佳人选可能不持有任何 USPA 评级，但可能具有关于降落伞控制和着陆的广泛知识。
   c. The signature of the S&TA on the proficiency card is to verify that the training has been satisfactorily completed by the candidate.
      熟练程度卡上的安全和培训顾问的签名是用来验证学生已圆满完成培训。
7. You may not sign for your own license application or initial any of the verification blocks of your own license application.
   您不能为自己的执照申请签名，也不能为自己的执照申请的任何验证区签名。
8. USPA will charge a separate license fee for each license number issued.
   USPA 将对每个签发的执照编号收取单独的执照费用。

E. LICENSE PRIVILEGES AND REQUIREMENTS「执照特权和要求」

A LICENSE 「A 执照」

Note: USPA Headquarters will accept either completed card signed by a USPA Instructor without the official stamp. The registration fee must be included.

注：USPA 总部将接受由 USPA 教练签署的未加盖公章的卡片。注册费必须包括在内。

1. Persons holding a USPA A license may jump without supervision, pack their own main parachute, engage in basic group jumps, 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、自行叠主降落伞、进行基本团体跳伞、进行水上跳伞，并且必须：
   a. completed 25 freefall skydives
   完成 25 次自由落体跳伞
   b. completed all requirements listed on the USPA A License Proficiency Card
   完成 USPA A 执照熟练程度卡上列出的所有要求
   c. completed five group freefall skydives involving at least two participants
   完成了 5 次至少有 2 名参与者的团体自由落体跳伞
   d. received the signature and official stamp on the USPA A License Proficiency Card or USPA A License Progression Card (ISP) which validates the A license for a 60-day time limit following the completion of the card
   收到 USPA A 执照熟练程度卡或 USPA A 执照进度卡（ISP）上的签名和官方盖章，该卡在完成后 60 天内可作为 A 执照的验证。
   e. The completed and signed USPA A License Proficiency Card or USPA A License Progression Card must be validated within 60-days of completion by sending the card to USPA Headquarters. Once validated, USPA will issue a license number that becomes a permanent record of the member.
   填妥并签名的 USPA A 执照熟练程度卡或 USPA A 执照进度卡必须在填妥后 60 天内通过发送至 USPA 总部进行验证。一旦完成验证，USPA 将发布一个执照号码，成为会员的永久记录。
   f. passed the USPA-developed written and oral USPA A-license exams conducted by a current USPA I, Examiner, S&TA, Judge or board member
   通过了由持有当前有效资格的 USPA 教练，或考官、安全和培训顾问、裁判、董事会成员进行的由 USPA 制定的 A 执照书面考试和口试。

B LICENSE「B 执照」

1. Persons holding a USPA B license are able to exercise all privileges of an A-license holder, perform night jumps, with 100 jumps are eligible for the USPA Coach Rating, 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 次跳伞后有资格获得 USPA 初级教练评级，并且必须：
   a. 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
   b. completed 50 jumps including:
   完成 50 次跳伞，包括：
      (1) 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
      (2) landed within 33 feet of target center on ten jumps
      在距离目标中心 33 英尺范围内降落 10 次
   c. successful completion of the planned formation(s) on ten formation skydives, or ten 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，无论是两种编队形式的哪一种，都必须包括至少 3 名参与者
   d. 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上降落训练的证明文件
   e. complete all of the requirements listed on the USPA Canopy Piloting Proficiency Card
   完成 USPA 降落伞控制熟练程度卡上列出的所有要求

f. passed the written USPA B-license exam conducted by a current USPA I, Examiner, S&TA, Judge or board member.
通过了由持有当前有效资格的 USPA 教练，或考官、安全和培训顾问、裁判、董事会成员进行的 B 执照书面考试。

C LICENSE「C 执照」

1. Persons holding a USPA C license are able to exercise all privileges of a B-license holder, are eligible for the USPA Instructor rating (except USPA Tandem Instructor), participate in certain demonstration jumps, may ride as passenger on 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，有资格获得 USPA 教练评级（USPA 双人伞教练除外），参加某些表演跳伞，可以作为 USPA 双人伞教练培训和评级更新跳伞的乘客，并且必须：
   a. 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
   b. 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
   c. landed within seven feet of target center on 25 jumps
   25 次在距离目标中心 7 英尺的范围内的着陆
   d. Successful completion of fifty formation skydives, or fifty formation freefly skydives, at least ten 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，无论是两种编队的哪一种，必须至少有 4 名参与者参与
   e. Passed the USPA written C-license exam conducted by a current USPA I, Examiner, S&TA, Judge or board member.
   通过了由持有当前有效资格的 USPA 教练，或考官、安全和培训顾问、裁判、董事会成员进行的 C 执照书面考试。

D LICENSE「D 执照」

1. Persons holding a USPA D license are able to 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，有资格获得所有 USPA 评级，并且必须：
   a. 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
   b. 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
   c. 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）：
      (1) night jump (following the SIM recommendations)
      夜间跳伞（按照 SIM 的建议）
      (2) landed within seven feet of the target center on 100 jumps
      在距离目标 7 英尺范围内的进行 100 次着陆
      (3) 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，完成一次完整的旋转
      (4) completed an intentional water jump
      完成一次故意的水面降落
      (5) 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

d. Passed the written USPA D-license exam conducted by a current USPA Examiner, S&TA, Judge Examiner or board member.
通过了由持有当前有效资格的 USPA 考官、安全和培训顾问、裁判考官、董事会成员进行的 D 执照书面考试。

F. RESTRICTED USPA LICENSES「限制性的 USPA 执照」

1. Under extreme circumstances, such as physical handicaps, a USPA Restricted license may be issued to applicants who are unable to meet all of the specific license requirements.
在极端情况下，如身体残疾，限制性执照可以签发给不能满足所有具体许可要求的申请人。
2. A person may be qualified for a Restricted license if the applicant has (all of the following):
如果申请人具备（以下所有条件），则可以获得限制性执照：
   a. submitted a petition to the Safety & Training Committee, containing:
   向安全和培训委员会提交了一份请愿书，其中包括：
      (1) type of license requested
      申请的执照类型
      (2) specific license requirement(s) which cannot be met
      无法满足执照的特定要求
      (3) circumstances which prevent compliance with license requirements
      妨碍满足执照要求的情况
      (4) license application completed, except for the restricted activities
      除限制性活动外，执照申请已完成
   b. met all requirements for the license desired except for those listed in the petition
   满足除请愿书中所列的活动以外的所有执照要求
3. Each application will be considered individually on its own merit, totally without precedent.
每一项申请都将根据其本身的特点单独审议，完全不依据先例。
4. If the waiver is approved by the board of directors, the license will be issued with the word “restricted”.
如果董事会批准豁免，执照上将印上“Restricted”（限制）字样。

3-2 执照考试和申请流程 License Exam and Application Procedures

A. LICENSE EXAM INSTRUCTIONS「执照考试说明」

1. A LICENSE「A 执照」：
   a. The examining USPA Instructor conducts a 40-question written USPA A-license exam and an oral quiz of at least 20 questions taken from the USPA Integrated Student Program syllabus, with emphasis on the following:
   USPA 教练进行含 40 个问题的 USPA A 执照书面考试和至少 20 个问题的口试，这些问题取自 USPA 综合学生计划大纲，重点如下：
      (1) cloud clearance and visibility requirements「云层间距和能见度要求」
      (2) equipment operation and maintenance「装备运行维护」
         (i) wing loading and its effects
         翼载及其影响
         (ii) closing loop
         关包绳
         (iii) velcro and tuck flaps
         魔术贴和加塞片（Tuck Flap）
         （译者注：Tuck Flap，这里译为加塞片，一般指降落伞伞包以及某些部件上的布片状（Flap）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加塞片（见 4-G）、某些 D 包上用于收纳松弛伞绳的加塞片。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，但有时候也会混用，例如组提带挡盖的加塞片有时候称作 Tuck Tab，有时候称作 Tuck Flap）
         (iv) packing and authorization to pack
         叠伞及叠伞的授权
      (3) canopy flight「降落伞飞行」
         (i) traffic patterns and collision avoidance
         交通航线和碰撞避免
         (ii) braked turns and obstacle avoidance
         带刹车转向和避障
         (iii) low turn avoidance and recovery
         避免低空转向，以及如何恢复平飞
         (iv) downwind landing procedures
         顺风着陆程序
         (v) obstacle landing emergency and recovery procedures
         障碍物紧急着陆和救援程序
      (4) aircraft procedures「机内程序」
         (i) during jump run and exit to observe balance limits
         在跳伞航线上和跳出飞机期间遵守飞机配平限制
         (ii) distance between groups to maintain separation
         保持各团体之间的分开距离
         (iii) aircraft emergency procedures
         飞机紧急程序
      (5) group breakoff recommendations「团体分离建议」
      (6) parachute emergency procedures「降落伞应急程序」
         (i) deployment malfunctions
         开伞故障

(ii) cutaway decide-and-act altitude
切伞的决断和实施高度

(iii) two-canopies-deployed scenarios
两个降落伞同时打开的场景

(7) accountability for FAR compliance「遵守 FAR 的责任」

b. The examining USPA Instructor conducts or arranges the review training required for the student to answer all questions correctly.
执行考试的 USPA 教练安排学生进行复习训练，以便学生正确回答所有考试问题。

c. The examining USPA Instructor conducts a skydive with the applicant to verify practical knowledge in the following areas:
执行考试的 USPA 教练与申请人一起跳伞，以验证以下考试领域的实际知识水平：

(1) 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；

(2) pre-jump equipment checks for self and others
对自己和他人进行跳伞前装备检查

(3) planning an effective group break-off
对团体分离进行有效计划

(4) right 360, left 360, 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）

(5) 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）

(6) breakoff altitude recognition and tracking for a minimum of 100 feet
能识别分离高度，能和 Track 至少 100 英尺

(7) signal before deployment and overall awareness during and after deployment
开伞前手势及开伞中、开伞后的整体意识

(8) 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

(9) packing and preparing equipment for the next jump
为下一跳叠伞和准备装备

(10) Review SIM Sections 2, 5, 6, 9, and Governance Manual section 1-6
复习 SIM 第 2、5、6、9 章以及 USPA 管理手册 1-6 节

d. Once the student has successfully completed the A-license check dive and answered all questions correctly on the oral exam and passed the written exam with a score of at least 75%, the certifying USPA Instructor may sign the student's A License Proficiency Card or the USPA A License Progression Card and apply the official USPA A-license stamp as proof of license qualification.
一旦学生成功完成 A 执照检查跳考试，并在口试中正确回答了所有问题，并以至少 75%的分数通过了笔试，其 USPA 教练可签署学生的 A 执照熟练程度卡或 USPA A 执照进度卡，并盖上 USPA 官方 A 执照印章作为执照资格证明。

e. The card is then considered a valid USPA A license for a 60-day time period.
然后，该卡被视为有效的 USPA A 执照，有效期为 60 天。

f. The completed card must be submitted to USPA Headquarters for processing to be considered a valid license beyond the 60-day time period.
填写完成的卡必须提交 USPA 总部进行处理，以在 60 天的时间以后仍能被视为有效的执照。

2. For B, C, and D licenses, the examining USPA official:
   对于 B、C、D 执照，USPA 审查官员：
   a. gives the applicant an answer sheet and the questions to the exam
      给申请人一张答题卡和试题
      (1) No references or other assistance are permitted during the exam.
          考试期间不允许提供任何帮助或参考文件。
      (2) After the test, the examining official collects the materials and grades the exam.
          考试结束后，考试官员收集材料，对试卷进行评分。
      (3) A score of 75% is required to pass.
          分数为 75%以上才能通过。
   b. The score is recorded on the license application and in the applicant's logbook.
      分数记录在执照申请和申请人的日志中。
      (1) The applicant not passing will be eligible to retake this exam after seven days.
          未通过考试的申请人可在七天后重新参加考试。
      (2) Applicants who have not passed the USPA online license testing program may retest using the same method immediately for a total of three attempts per day.
          未通过在线执照考试的申请人可以立即重新进行考试，每天的考试机会不超过三次。
      (3) 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.
          要获得更高级别的执照，申请人必须持有 USPA 执照，符合较低级别执照的所有要求，并且已通过所有较低级别执照的考试。

B. PRESENTING A COMPLETED LICENSE APPLICATION「提交已完成的执照申请」

1. A LICENSE
   a. The completed A license Proficiency Card or USPA A-License Progression Card signed by the certifying USPA Instructor and bearing the official A-license stamp, is proof of a USPA A license for a 60-day period from the completion date.
      由 USPA 教练签名并加盖官方 A 执照印章的填写完整的 A 执照熟练程度卡或 USPA A 执照进度卡，自完成日期起 60 天内，可作为 USPA A 执照的证明。
   b. To receive an A license, the holder must submit a completed A-License card to USPA with the appropriate license registration fee:
      要获得 A 执照，持有人必须向 USPA 提交一张完整的 A 执照卡，并支付相应的执照注册费：
      (1) Fax both sides of the completed license application to USPA with a credit card authorization.
          将已填写完成的执照申请书的两面传真给 USPA，同时附上信用卡授权。
      (2) Photocopy both sides of the completed license application and mail it with payment.
          将填写完成的执照申请书的两面影印，并邮寄和付款。
      (3) Scan and email a copy of the card to membership@uspa.org
          扫描并将卡的副本发送至 membership@uspa.org
      (4) A completed and signed A-License application need not be stamped to be registered with USPA (USPA keeps a copy of all USPA Instructor signatures on file); however, an A License Proficiency Card is not considered official until the card is submitted to USPA for verification and a license number is issued.
          填写完整并签名的 A 执照申请书无需加盖印章即可在 USPA 注册（USPA 有所有 USPA 教练签名的存档）；但是，在将 A 执照熟练程度卡提交 USPA 验证并签发执照编号之前，该 A 执照熟练程度卡不被视为正式文件。
2. B, C, and D license applicants may email, mail or fax their completed application with the appropriate fee to USPA Headquarters.
   B、C、D 执照申请人可通过电子邮件、邮件或传真将其填妥的申请表连同相应费用发送至 USPA 总部。

3. Once any new license has been registered with USPA, the applicant will receive a new membership card with the license number, which is also published in Parachutist.
   一旦任何新的执照在 USPA 注册，申请人将收到一张带有执照号码的新会员卡，该执照号码也将在“跳伞者”（Parachutist）杂志上公布。

C. LICENSE APPLICATION CHECKLIST「执照申请检查单」

1. The verifying official signing the license application should check that each of these items has been completed:
   在执照申请上签字的核查官员应检查以下各项是否已完成：
   a. applicant’s personal information「申请人的个人信息」
   b. experience verification「经历验证」
      (1) number of jumps「跳伞次数」
      (2) freefall time, if applicable「自由落体时间，如适用」
   c. skill verification「技能验证」
2. The official verifies (by initialing) either that:
   官员（使用名字首字母签名）认证以下其中一项：
   a. The jump number, date, or score for each requirement is correct and can be found in the applicant’s logbook.
      每个要求对应的跳伞次数、日期或分数都是正确的，且可以在申请人的日志中找到。
   b. If applicable, the applicant’s appropriate license number is included with the application.
      如适用，申请书中应包括申请人的相应执照号码。
3. Official verifying B, C, and D licenses should check that the written exam answer sheet is complete with a passing score.
   官员认证 B、C、D 执照，应检查笔试答卷是否完整，且成绩合格。
4. For the B License, include a copy of the completed Canopy Piloting Proficiency Card with the license application.
   对于 B 执照，请在执照申请中附上一份完整填写的降落伞控制熟练程度卡。
5. Sign and print name, title, and date in the space provided on the application.
   在申请表的空白处签名和打印姓名、职务和日期。

3-3 评级 Ratings

A. USPA INSTRUCTIONAL RATINGS「USPA 教学评级」

USPA issues instructional ratings to each skydiver who qualifies by fulfilling all requirements for the rating being sought. These ratings attest that the holder has not only achieved skydiving skills but has also demonstrated the techniques needed to teach these skills to others.
USPA 向符合要求的跳伞者签发教学评级。这些评级证明持有者不仅取得了跳伞技能，而且还有向他人传授这些技能所需的技术。

1. Ratings are issued at the following levels (from lowest to highest):
   评级按以下级别（从最低到最高）签发：
   a. Coach「初级教练」
   b. Instructor「教练」
   c. Examiner「考官」

（译者注：除非另有说明，否则在本手册的翻译中，“初级教练”（Coach）和“教练”（Instructor）是两个不同的概念，“教练”不包含“初级教练”，USPA 教学评级包含了初级教练评级、教练评级、考官评级。应特别注意，还有一类提供高阶跳伞科目培训（如翼装、自由飞等）的教学人员，英文也称为“Coach”，在本手册的翻译中，为示区分，将此类教学人员统称为“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）

2. USPA Instructors may be qualified to conduct initial skydiving training in one or more disciplines:
   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：
   a. harness hold (USPA Accelerated Freefall or AFF)「Harness-hold（USPA AFF）」
   b. instructor-assisted deployment「教练辅助开伞（IAD）」
   c. static line「Static Line（SL）」
   d. tandem「双人伞」

The USPA Coach may act as a supervised assistant to the USPA Instructor to teach specified portions of the first-jump course. Any USPA instructional rating holder may perform the duties of the USPA Coach or of any lower rating holder in his or her discipline.
USPA 初级教练可以作为 USPA 教练的助理，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 初级教练或其培训方法中任何较低评级持有者的职责。

USPA Examiners appoint qualified instructional rating holders as course evaluators in accordance with the requirements outlined in the USPA Instructional Rating Manual. All policies, procedures, new rating and renewal requirements, and the rating course outlines, support materials and examinations are found in the USPA Instructional Rating Manual.
USPA 考官根据 USPA 教学评级手册中的要求，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。

B. NEWLY RATED INSTRUCTORS「新获得评级的教练」

Instructors who have just completed a certification course should be paired with more seasoned staff as they begin to work with students in any new discipline. The Instructional Rating Manual includes recommendations for new rating holders in Section 1 of each of the rating course sections.
刚完成认证课程的教练在开始通过新的培训方法与学生合作时，应与经验丰富的工作人员配对。面向新获得教学评级的人员的建议，可以在教学评级手册在每门评级课程的第 1 节中找到。

C. USPA PRO PROFESSIONAL EXHIBITION RATING「USPA 专业表演等级」

The Federal Aviation Administration and USPA cooperate on an alternative means for skydivers to demonstrate competence to perform skydiving shows before the public via a USPA PRO Exhibition rating. The program is described in the Exhibition Jumping Section of the SIM. The FAA may ask jumpers who do not hold a USPA 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，为跳伞者提供了另一种选项，可以通过 USPA PRO 专业表演评级来证明其有能力在公众面前进行跳伞表演。这个程序在本手册的跳伞表演章节有描述。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。

D. USPA JUDGE RATING「USPA 裁判评级」

To assist in the administration of skydiving competitions at various levels from local and regional to World Championships, USPA conducts the USPA Judges program. Judges are rated as Regional, National, and International. Details on the USPA Judge rating program and the National Judge Training Course are detailed in the USPA Skydiver's Competition Manual.

为了协助管理从地方性和区域性到世界锦标赛的各个级别的跳伞比赛，USPA 设立了裁判评级程序。裁判分为地区裁判、国家裁判和国际裁判。USPA 跳伞者比赛手册中详细介绍了 USPA 裁判评级程序和国家裁判培训课程。

E. FAA RATINGS「联邦航空局评级」

The Federal Aviation Administration administers the programs that certify parachute riggers, aircraft mechanics, and pilots. The rules for these drop zone staff members are found in the Federal Aviation Regulations, many pertinent parts of which are included in the SIM Section 9, FAA Documents.

联邦航空局负责管理认证降落伞装备师（Rigger）、飞机机械师和飞行员的项目。这些跳伞基地工作人员的规定请见联邦航空条例，其中许多相关部分也被包括在本手册第九章联邦航空局文件中。

Skydiving students study the role of the rigger and supervised packers in detail while preparing for the USPA A license using the Integrated Student Program in the SIM. In addition, they overview pilot rating requirements and the role of the FAA mechanic.

跳伞学生在根据本手册的综合学生计划准备考取 USPA A 执照时，应详细学习装备师（Rigger）和叠伞员的角色。此外，他们应了解飞行员等级要求和联邦航空局机修工的角色。

第四章 USPA 综合学生计划

USPA Integrated Student Program

SECTION SUMMARY「章节摘要」

Regardless of discipline, the USPA Integrated Student Program advances students through eight categories of proficiency (A-H) to qualify them for their USPA A license.
无论采取哪种培训方式，USPA 综合学生计划都通过八个单元（A-H）来使学生具备获取 USPA A 执照的资格。

Each student completes a series of required skills and knowledge sets while making the prescribed training jumps in each category. At the end of each category, a student in any training discipline has achieved similar skills and knowledge. The number of jumps to complete each category depends on the training discipline and the student's performance.
每个学生完成一系列必备技能和知识集的学习，同时根据每个单元的规定进行训练跳伞。学完一个单元后，无论使用何种培训方式，学生都应获得了相似的技能和知识。完成每个单元的所需的跳伞次数取决于培训方式和学生的表现。

When a student completes the requirements for each category, the USPA Instructor records it on the student's USPA A-License Proficiency Card and Application and administers an oral quiz. Especially in Categories A-D, the student should complete all the objectives of one category before making any jumps in the next.
当学生完成每个单元的要求时，USPA 教练将其记录在学生的 USPA A 执照熟练程度卡和执照申请书上，并进行口头测验。尤其在 A 至 D 单元中，学生应完成一个单元的所有目标后，再进行下一个单元的跳伞训练。

An appropriately rated USPA Instructor must directly supervise each student jump until the student is cleared to self supervise during Category E. A USPA Coach may conduct freefall training and supervise jumps for those students in Categories E through H. A USPA Coach may also supervise static-line and IAD students following a successful clear-and-pull in Category C. Until the USPA A license, all student training remains the responsibility of the USPA Instructor.
持有其教学内容的培训方法所对应的教练评级的 USPA 教练必须直接监督每个学生的跳伞，直到学生被允许在 E 单元期间进行自我监督。USPA 初级教练可以对 E 单元到 H 单元的学生进行自由落体训练和监督其跳伞。USPA 初级教练也可以监督采用 Static-line 和 IAD 培训方法的学生，前提是学生能成功完成 C 单元的净空开伞。在获得 USPA A 执照之前，所有学生培训仍由 USPA 教练负责。

Once meeting all the requirements listed on the USPA A-License Application, the student will make a check jump with a USPA Instructor to be issued the USPA A license. The check jump consists of an overall review of the training and includes a final quiz with questions taken from the quizzes at the end of each category.
一旦满足 USPA A 执照申请中列出的所有要求，学生将与 USPA 教练进行检查跳，以获得 USPA A 执照。检查跳包括对培训的全面回顾，并带有期末测验，测验问题来自每个单元末尾的小测。

The USPA Integrated Student Program provides one effective and detailed progression for training students for their A license. It is not a required program or the only good training outline. However, students should ensure that the training program at their school meets the USPA standards outlined in the Basic Safety Requirements.
USPA 综合学生计划为培训学生获取 A 执照提供了一个有效和详细的学习路线。它不是一个强制的训练计划，也不是唯一的优秀训练大纲。但学生应确认其培训计划符合 USPA 基本安全要求中所述的标准。

WHO NEEDS THIS SECTION?「谁需要这部分」

- skydiving students「跳伞学生」
- instructional rating holders「教学评级持有者」
- drop zone staff developing student training programs「跳伞基地负责学生训练计划的工作人员」

	Jump Numbers and Supervision	Exit and Freefall	Canopy Flight	Equipment	In-Depth Emergency Review*	Rules and Recommendations	Spotting and Aircraft
A	AFF: 1 (Two AFFIs) SL/IAD: 1-2 (SLI/IADI) Tan: 1 (TI)	Adaptation to skydiving environment; principles of deployment	Steering; intro pattern; wind line; landing procedures	Altimeter and operation handle orientation; instructor gear checks	Passive aircraft emergencies (instructor leads)	FAR 91.107 (seat belts); SIM 2-1 (first-jump course topics)	Propeller avoidance; movement in aircraft
B	AFF: 2 (Two AFFIs) SL/IAD: 3-5 (SLI/IADI) Tan: 2-3 (TI)	Relaxed body position; leg awareness; unassisted stable deployment (simulated for SL/IAD)	Assisted pattern; assisted flare; written flight plan; review PLF	Handle operation and protection	Training harness: deployment problems; partial and total malfunctions; stability recovery; and altitude awareness	SIM 2-1 (students), 5-1 (malfunctions); FAA AC- 90-66A (illustration of aircraft traffic patterns)	Airport orientation and recognition; runway and approach incursions; aircraft patterns
C	AFF: 3-4 (Two AFFIs, then one) SL/IAD: 6-8 (SLI/IADI, Coach) Former Tan: 4-5 (AFFI)	Solo controlled and relaxed fall; heading maintenance; wave-off	Solo pattern and flare; wing loading; turbulence; downwind landings	Complete orientation (main closed); observe pre-flight	Open parachute in aircraft; off-airport landings; obstacle recognition and avoidance; turbulence; collapsing the canopy on landing	SIM 2-1 (student equipment); FAR 105.43.b.1 (equipment); local laws; canopy owner's manual	Pattern selection
D	AFF: 5-6 (AFFI) SL/IAD: 9-12 (SLI/IADI, Coach) Former Tan: 6-7 (AFFI)	Solo exit (AFF); heading control; freefall speeds and times	Back-riser control with and without brakes; stand- up; 165 feet assisted	Assisted pre-flight; AAD operation; AAD owner's manual	Training harness: routine opening problems; instant recognition and response; building landings	SIM 5-1 (buildings), 5-3 (AADs); FAR 105.17 (clouds)	Jump run observation; looking below for aircraft
E	AFF: 7-9 (AFFI) until cleared from AFF, then Coach SL/IAD: 13-15 (SLI/IADI, Coach) (Merge tandem)	Door exit; aerobatics; unsupervised freefall	Stalls; traffic avoidance; 165 feet unassisted; the "sweet spot," rectangular v. elliptical	Complete orientation (open canopy); component identification; unassisted pre-flight; comprehensive RSL	Training harness: two canopies out; high-wind landings; independent aircraft emergencies	SIM 2-1 (winds), 2-1.M (oxygen), 5-1 (dual deployments), 5-3 (RSLs); 5-3 (altimeters); FAR 91 (pilot responsibilities); FAR 105.43.a and b (packing authorization and interval)	Aircraft orientation; airspeed; weight and balance; winds aloft; intro spot selection; assist with jump run
F	AFF: 10-13 SL/IAD: 16-17 Coach	Tracking; two clear and pulls for former AFF students	Braked turns, approach, and landing; maximum glide; 82 feet on two jumps	Assisted packing; pin check (others); parachute system and canopy owner's manuals	Power line landings	SIM 2-1 (all), 3-1 (all), 5-1 (power lines), 5-2 (currency recommendations), 5-7 (group separation); parachute system and reserve owner's manuals	Group separation; assisted jump run; calculating exit point from winds aloft
G	AFF: 14-17 SL/IAD: 18-21 Coach	Group exits; forward motion; rate of descent; docking; break-off and separation	Collision avoidance review; reverse turns; 65 feet on two jumps	Solo packing; rigger's responsibilities; maintenance orientation; AAD review	Canopy collision response; tree landings	SIM 5-1 (trees), 5-1 (collisions), 5-5 (weather), 6-1 (group freefall); FAR 105.43.c (AAD maintenance)	Unassisted jump run; weather
H	AFF: 18-21 SL/IAD: 22-25 Coach	Diver exit; diving; traffic awareness during diving, tracking and deployment	Front riser control; 65 feet on three jumps	Owner maintenance (three-ring, closing loop)	Water landings; low-turn recovery	SIM 5-1. (water), 5-1 (low turns), 6-2 (breakoff); FAR 105.13 (aircraft radio); 105.15 (notification); AC 105-2C App. (aircraft)	Notification to FAA of jump activity; review STC, 337, etc.

*After training recommended in the USPA Integrated Student Program for solo students coming from tandem.

*在 USPA 综合学生计划建议的、双人伞培训方法转换而来的单人跳伞学生训练内容之后

	跳伞次数和监督者	出舱和自由落体	伞控	装备了解和操作	深入的紧急流程回顾 *	规则和建议	看点和机内流程
A 单元	AFF：第 1 跳（2 名 AFF 教练） SL（Static-line 下同）/IAD：第 1-2 跳（SL/IAD 教练） 双人伞：第 1 跳（双人伞教练）	适应跳伞环境；知道开伞原则	转向，航线入门，风线（经过着陆目标的虚拟风向线），降落程序	高度表、找各个操作把手；教练检查装备	被动机内紧急流程（教练主导）	FAR 91.107（安全带）SIM 2-1（第一跳相关）	避开螺旋桨；机内如何移动
B 单元	AFF：第 2 跳（2 名 AFF 教练） SL/IAD：第 3-5 跳（SL/IAD 教练） 双人伞：第 2-3 跳（双人伞教练）	放松，控腿；无协助稳定开伞（SL/IAD 则模拟稳定开伞）	在协助下走航线、拉平降落；书面的飞行计划；复习 PLF	把手的操作和保护	使用训练背带模拟开伞问题；部分和完全故障；恢复稳定；高度感知	SIM 2-1（学生），5-1（故障）；FAA AC-90-66A（飞机起落航线图）	机场了解和设施认识；跑道入侵和进近干扰；飞机航线
C 单元	AFF：第 3-4 跳（先 2 名后 1 名 AFF 教练） SL/IAD：第 6-8 跳（SL/IAD 教练、初级教练） 原双人伞：第 4-5 跳（AFF 教练）	独立自由落体控制并放松；保持朝向；挥手示意	单人跳伞着陆航线和拉平；了解翼载；了解乱流；顺风降落	全面入门（已关包的装备）；观摩登机前的装备检查	降落伞在机舱内被打开；场外降落；识别和避免障碍物；乱流；降落后使伞脱离充气状态	SIM 2-1（学生装备）；FAR 105.43.b.1（装备）；当地法规；降落伞说明书	航线选择
D 单元	AFF：第 5-6 跳（AFF 教练） SL/IAD：第 9-12 跳（SL/IAD 教练、初级教练） 原双人伞：第 6-7 跳（AFF 教练）	独立出舱（AFF）；朝向控制；自由落体速度和时间	后组提带控制（带和不带刹车）；站降；在协助下达到 165 英尺精准降落	有协助的登机前装备检查；AAD 操作；AAD 说明书	使用训练背带模拟常见开伞问题；快速识别问题并反应；建筑物降落	SIM 5-1（建筑物）；5-3（AAD）；FAR 105.17（云层）	跳伞航线观察；找下方飞机
E 单元	AFF：第 7-9 跳（AFF 教练）直至 AFF 毕业，然后由初级教练监督 SL/IAD：第 13-15 跳（SL/IAD 教练、初级教练） （与双人伞合并）	舱门出舱；特技；无监督自由落体	失速；交通避让；165 英尺无协助精准度；找伞的甜点；矩形和椭圆伞比较	全面入门（对拉出主伞的装备）；组件识别；无协助的登机前装备检查；深入了解 RSL	使用训练背带模拟主伞和备伞同时打开的问题；大风降落；独立舱内紧急程序	SIM 2-1（风），2-1.M（辅助供氧），5-1（主备伞同时打开）5-3（RSL）；5-3（高度表）；FAR 91（飞行员职责）；FAR 105.43.a 和 b（叠伞授权和间隔）	认识飞机；空速；飞机的重量配平；空中风况；入门看点定位；有协助的识别跳伞航线
F 单元	AFF：第 10-13 跳 SL/IAD：第 16-17 跳 （初级教练）（*译者注：持初级教练评级的更高教学评级持有者亦可进行监督，下同*）	Tracking：两次净空开伞（对于 AFF 学生）（*译者注：即跳两次低空*）	带刹车转弯，进近，降落；全速滑翔；两跳达到 82 英尺精度	有协助的叠伞；检查他人的装备；装备和降落伞伞布厂商的说明书	高压线降落	SIM 2-1（全部），3-1（全部），5-1（高压线），5-2（复训建议），5-7（团体分离）；降落伞系统和备伞说明书	团体分离；有协助的识别跳伞航线；根据空中风况计算出舱点
G 单元	AFF：第 14-17 跳 SL/IAD：第 18-21 跳 （初级教练）	多人出舱；前向运动；下降率控制；连接；编队分离	复习避免碰撞；反向转弯；两跳 65 英尺精准度	独立叠伞；了解装备师的职责；了解装备维护；复习 AAD	降落伞碰撞处理；树降	SIM 5-1（树），5-1（碰撞），5-5（天气），6-1（团体自由落体）；FAR 105.43.c（AAD 维护）	无协助的跳伞航线识别；气象知识
H 单元	AFF：第 18-21 跳 SL/IAD：第 22-25 跳 （初级教练）	俯冲出舱；俯冲；俯冲、Tracking 和开伞时的空中交通意识	了解前组提带控制；三跳 65 英尺精准度	装备维护（三环系统，关包绳等）	水降；低转改平	SIM 5-1（水降），5-1（低转），6-2（分离）；FAR 105.13（机载无线电通讯）；105.15（通知）；AC 105-2C App.（飞行器）	致 FAA 的跳伞活动通知；复习 STC，337 等

4-2 A 单元至 H 单元目标概述 Categories A-H Objectives Overview

CATEGORY A「A 单元」

all—全部学生

- canopy control「降落伞控制（伞控）」
- landing approach「着陆进近」
- landing principles「着陆原则」
- exit「出舱」
- stable fall「稳定自由落体」
- deployment「开伞」
- aircraft emergencies「机内紧急情况」

solo students—单人跳伞学生（即非双人伞培训方法的学生）

- equipment emergencies「装备紧急情况」
- landing emergencies「着陆紧急情况」

CATEGORY B「B 单元」

- relaxing in the skydiving environment 「在跳伞环境中放松」
- heading awareness「朝向意识」
- parachute deployment「开伞」
- more on the landing pattern「深入了解着陆航线」
- airport orientation「了解机场」
- protecting handles「保护把手」
- equipment emergency review「装备紧急情况回顾」

CATEGORY C「C 单元」

- unassisted freefall with heading maintenance 「无辅助自由落体且保持朝向」
- hover control「悬停控制」
- solo deployment「独立开伞」
- landing patterns for higher winds「大风着陆航线」
- downwind landings「顺风降落」
- wing loading「翼载」
- accidental opening review「意外开伞情况的复习」
- turbulence「乱流」
- landing off「场外着陆」
- obstacle recognition「地面障碍物的识别」
- the FAA rigger「联邦航空局认证的降落伞装备师」
- the closed parachute system「已关包的降落伞」

CATEGORY D「D 单元」

- solo, unassisted exit (AFF students) 「独立无协助的出舱（AFF 学生）」
- freefall turns「自由落体转向」
- freefall speeds and times review 「复习自由落体速度和时间」
- back-riser control「后组提带控制」
- building landing review「复习建筑物着陆」
- AAD (owner's manual)「AAD（用户手册）」
- pre-jump equipment check「跳前装备检查」
- introduction to three-ring release operation 「三环释放系统简介」
- cloud clearance and visibility「云层间距和能见度」
- observe jump run「观察跳伞航线」

CATEGORY E「E 单元」

- door (unpoised) exit 「舱门出舱（即出舱时不扒机身外部结构）」
- recovering stability and awareness 「恢复稳定性和稳定意识」
- aerobatics「特技」
- stalls「失速」
- the canopy's "sweet spot"「降落伞的"甜点"」
- two canopies deployed (review) 「主伞和备伞同时打开的情况（复习）」
- high-wind landings「大风着陆」
- reserve static line「联动装置（RSL）」
- open parachute orientation「了解展开的降落伞」
- parachute packing and supervision 「降落伞的叠伞和叠伞监督」
- wind limits「风速限制」
- aircraft briefing「飞机简报」

CATEGORY F「F 单元」

- introduction to tracking「Tracking 入门」
- two clear and pulls (former AFF students) 「2 次净空开伞（*译者注：跳低空*）（原 AFF 学生）」
- braked turns, approaches, and landings 「带刹车转向、进近和着陆」
- extending the glide「延长滑翔距离和时间」
- acting as jumpmaster or jump leader 「担任跳伞指导或领队」
- power-line landing review「复习高压线着陆」
- packing with assistance「在协助下进行叠伞」
- checking others' equipment「检查他人的装备」
- procedures following inactivity 「长期不跳后的复训程序」
- winds aloft and the exit point「高空风和出舱点」
- separating groups during exit 「如何分组出舱，以及出舱间隔」

- aircraft emergency procedures「机内紧急程序」
- selecting the opening point「选择开伞点」

CATEGORY G「G 单元」

- group exits「团体出舱」
- floater position「舱外离机者的位置」
- forward and backward movement 「向前和向后移动」
- adjusting fall rate「调整下降速率」
- start and stop「动作的开始和停止」
- docking「连接」
- maximum-performance canopy turns 「降落伞的最大性能转向」
- collision avoidance and response review 「复习避免降落伞碰撞以及应对措施的回顾」
- tree landing review「树降的回顾」
- equipment maintenance inspection 「装备维护检查」
- weather for skydivers「跳伞天气」

CATEGORY H「H 单元」

- diver exit「俯冲出舱」
- diving「俯冲」
- breakoff「分离」
- front riser control「前组提带的控制」
- water landing review「水降回顾」
- owner maintenance of gear 「装备所有者的装备维护」
- aircraft radio requirements「飞机无线电通信要求」
- FAA notification requirements for jumping 「联邦航空局关于跳伞通知的规定」
- FAA approvals for jump planes 「联邦航空局对跳伞作业飞机的批准」

4-3 USPA 综合学生计划简介

USPA Integrated Student Program: An Introduction

A. RECOMMENDATION「建议」

USPA recommends that skydivers complete training in the Integrated Student Program (ISP), an effective means of preparing a student for the USPA A license.

USPA 建议跳伞者完成综合学生计划（ISP）的培训，这是学生考取 USPA A 执照的有效途径。

B. WHAT IS THE ISP?「什么是综合学生计划（ISP）」

1. USPA developed the ISP as a comprehensive training outline that meets the USPA Basic Safety Requirements (BSRs) for student training in all training methods.

   USPA 开发综合学生计划作为综合培训大纲，以满足 USPA 在所有培训方法中对学生培训的基本安全要求（BSR）。

   a. Some schools have developed equivalent programs that train the student to meet all the qualifications of the USPA A license.

      一些跳伞学校开发了等效的培训项目，以使学生具备 USPA A 执照的资格。

   b. A prospective student should be able to ask a school to compare its program against this industry standard program.

      即将开始学习的学生应要求学校将其课程与行业标准对标。

2. USPA recognizes the following training methods, or disciplines:

   USPA 认可以下培训方法或方式：

   a. USPA Accelerated Freefall (AFF or harness hold), where the student exits with two instructors who hold the student by the parachute harness for guidance and observation.

      USPA 自由落体跳伞学生培训方法（即 AFF，或 Harness-hold）：该方法中，学生与两名教练一起离机，两名教练抓稳学生的降落伞背带，以便指导和观察学生。

   b. Instructor-Assisted Deployment (IAD) and Static Line, the same method using different equipment during the initial jumps

      IAD 和 Static Line 培训方法，这两种方法类似，只是在初始跳伞期间使用不同设备

      (1) pilot chute deployed by the instructor as the student exits (instructor-assisted deployment)

          IAD 培训方法：学生离机时由教练拉开引导伞

      (2) deployment via a static attachment to the aircraft that separates once the parachute deploys (static line)

          Static Line 培训方法（或简称 SL）：通过飞机上的固定连接件来开伞，开伞后，连接件与伞分离

   c. Tandem, where the student's harness is attached to the front of the instructor's harness as part of a specially designed and built parachute system for tandem skydiving

      双人伞培训方法：学生的背带系在教练背带的前部，学生所用的背带是为双人伞跳伞专门设计的降落伞系统的一部分

   d. vertical wind tunnel training, where a student receives instruction and practices basic freefall control and maneuvering

      垂直风洞训练：学生接受指导并练习基本自由落体控制和动作

3. As ISP students progress, those training in one method demonstrate an equivalent level of knowledge and skill as ISP students trained in other methods.

   随着学生们在综合学生计划中一点点进步，采用不同培训方法的学生的知识和技能水平会达到同等水平。

C. CHOOSING A SCHOOL「选择跳伞学校」

1. Many regions are served by more than one skydiving center, so shop around.
   许多地区都有不止一个跳伞基地，所以要货比三家。
2. Ask questions (personal observation is even better) about the types of training offered, the type of equipment used, staff qualifications, etc.
   就所提供的培训方法、使用的装备类型、员工资质等提出问题（个人亲自观察了解更好）。
3. USPA maintains a list of current Group Member drop zones on the USPA website, uspa.org.
   USPA 在官网（uspa.org）上定期更新当前的团体会员（跳伞基地）列表。

D. WHAT TO EXPECT「接下来会发生什么」

1. Registration「登记」
   a. Upon arrival at the jump center, register with the skydiving school.
      到达跳伞基地后进行注册。
   b. All jumpers will be required to fill out a registration form which will usually ask for name, address, age, height, weight, occupation and the name, address, phone number, and relationship of someone to contact in case of emergency.
      所有跳伞者都需要填写登记表，登记表通常会询问姓名、地址、年龄、身高、体重、职业以及紧急联系人的姓名、地址、电话号码和关系。
2. Liability release「责任免除」
   a. Each participant will also be required to agree to and sign a liability release.
      每位参与者还将被要求同意并签署一份免责协议书。
   b. This release will verify that the person understands that there is risk involved in skydiving and that the participant freely agrees to accept that risk.
      此协议书将确认该参与者是否了解跳伞涉及的风险，以及参与者是否自愿同意接受这些风险。
   c. The legal release will usually contain a contract or covenant by which the participant agrees not to sue the skydiving school or anyone else if the participant is injured.
      这份法律协议通常包含一份合同或契约，根据该合同或契约，如果参与者受伤，其同意不起诉跳伞学校或任何其他人。
3. All participants in skydiving must meet the USPA BSRs for medical fitness.
   所有参加跳伞运动的人必须符合 USPA 的健康标准。
   a. A person should be in good health and physical condition to skydive and should not be on medication; however, some conditions can be properly managed if the instructor knows about them.
      跳伞时，人应处于健康良好的身体状态，不应服药；但是，如果教练熟悉某些情况，可以对其进行适当管理。
   b. An FAA flight physical or a doctor's statement of fitness for skydiving may be required in some cases.
      在某些情况下，可能需要联邦航空局的飞行体检或医生的跳伞健康声明。
   c. The instructor also needs to know about any recent donations of blood.
      教练还需要知道学生最近的献血情况。
   d. People who participate in SCUBA diving should not fly for at least 24 hours afterward.
      参与潜水的人员至少 24 小时内不得跳伞。
   e. Refer to faa.gov/pilots/medical/ for more information on medical fitness for flight.
      请参阅 faa.gov/pilots/medical/了解更多有关飞行健康的信息。

USPA STATEMENT OF MEDICAL FITNESS「USPA 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."

"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。”

“I also represent and warrant that I am not taking any medications or substances, pre- scription, or otherwise, that would impair my ability to participate in skydiving.”

“我还声明并保证，我不会服用任何药物或毒品、处方，或其他会损害我参加跳伞的能力的药物或物质。”

4. All participants in skydiving must meet the BSRs for age.
   所有参加跳伞的人都必须符合基本安全要求规定的年龄标准。
5. Upon completion of ground school and before the first jump, students should be required to pass written, oral, and practical tests.
   在完成地面学校后和第一次跳伞之前，学生应通过书面、口头和实操测试。

E. STUDENT EQUIPMENT「学生装备」

1. Students are provided with additional safety devices not usually found on equipment used by non-students.
   为学生提供的附加安全装置通常不用在非学生使用的装备上。
2. Special requirements for student parachute systems are listed in the BSRs.
   学生降落伞系统的特殊要求在基本安全要求中列出。
   a. From the start, a student should be taught to be self-reliant and to respond quickly to emergency situations.
      从一开始，学生就应该学会靠自己，对紧急情况做出快速反应。
   b. Safety devices and features should be designed as emergency overrides or backups only, in the event that the student does not properly perform emergency procedures.
      安全装置和功能应仅作为紧急超控方式或备份措施，以防学生不能正确执行紧急程序。
   c. Students should never use these features as a substitute for proper training and supervision
      学生不应利用它们代替适当的训练和监督
   d. Emergency back-ups give confidence to the student and peace of mind to the instructor.
      紧急备份能给学生信心，让老师安心。
3. Student equipment should be well maintained.
   学生装备要保养好。
4. Standardization「标准化」
   a. Changes in type of equipment and procedures should be avoided or minimized whenever possible during student training.
      学生培训期间，应尽可能避免或减少装备类型和培训方法的变动。
   b. When changes are made, adequate transition training must be provided in compliance with the BSRs.
      当有变动时，必须根据基本安全要求提供足够的过渡培训。
   c. Foresight should be used to minimize the need to change emergency procedures as a student progresses.
      当学生一点点进步时，应预先考虑，将改变紧急程序的必要性降到最低。
5. Canopies used for students should be large, docile, and appropriate for the student’s weight.
   学生使用的降落伞应该面积大，易控制，且适合学生的体重。

F. TRAINING PRIORITIES「优先培训重点」

1. The most important skill a skydiver must develop is the ability to cope with and respond to emergency situations. A student should review emergency procedures at the beginning of every jump day. The review must cover emergency procedures for these areas:
   跳伞者必须掌握的最重要的技能是如何应对和解决紧急情况。学生应在每天跳伞之前复习紧急程序。复习内容必须涵盖以下方面的紧急程序：
   a. equipment「装备」
   b. aircraft「飞机」
   c. freefall「自由落体」

d. deployment「开伞」
e. canopy「降落伞」
f. landing「着陆」

2. Development of these skills should start with the first jump rather than at a point where supervision of jumping activities is reduced.
   这些技能的学习应该从第一跳开始，而不是在教练开始减少对学生跳伞的监督后才起步。
3. Initial training, even if the student intends to make only one jump, should be designed to establish a foundation for the continuing growth and development of skills.
   即使学生打算只跳一次，最初的训练也应该为技能的持续提升和发展打下基础。

4-A A 单元Category A

INTRODUCTION 序言

This first category of the ISP includes the first-jump course, presented according to your training discipline.
综合学生计划（ISP）的第一单元包括根据学生的培训方法推出的第一跳（首跳）课程。

A USPA Coach may teach the solo general section, which contains topics and procedures common to all solo first jumpers in the AFF, IAD, or static-line programs. A USPA Instructor in that student's training discipline is required to teach any sections unique to the student's training method.
USPA 初级教练可以教授单人跳伞学习的通用知识部分，其中包含所有单人第一跳学生在 AFF、IAD 或 Static Line 培训方法中都能见到的主题和程序。学生培训方法所特有的任何部分必须由该培训方法所对应的 USPA 教练教授。

Depending on school policy, tandem skydivers may train for only the minimum information required to make a tandem jump safely, or they may train to meet the Category A advancement criteria. Only a USPA Tandem Instructor may conduct skydiving training in the tandem method, but a USPA Coach may assist.
根据不同学校的政策，双人伞学生可以只接受安全进行双人跳伞所需的最基本训练，也可以接受符合 A 单元晋级标准的训练。只有 USPA 双人伞教练可以通过双人伞进行跳伞训练，但 USPA 初级教练可以协助。

All ISP categories include recommended minimum deployment altitudes and the number of skydives it takes on the average to complete that category of training (column on right). They vary within a category, according to your training discipline.
综合学生计划的所有单元都包括建议的最低开伞高度，以及完成该单元的训练（见下栏）所需要的平均跳伞次数。根据不同的培训方法，完成同一个单元所需的跳数可能会不同。

Following each category introduction is a category overview called "Category at a Glance." It lists the advancement criteria you should meet before progressing to the next category of training. The school should provide you a USPA A-License Card and begin checking off training sessions and advancement criteria early in the training program.
每单元的序言之后都有单元概述，称为“单元概览”。它列出了学生在进入下一个培训单元之前应该达到的晋级标准。学校应该提供给学生一张 USPA A 执照进度卡，并在培训计划之初就开始对已完成的培训内容和已满足的晋级标准做上标记。

At the end of each category, the supervising USPA Instructor conducts an oral quiz based on topics from the training outline and the recommended readings ("book stuff") listed with the "Category at a Glance."
在每个单元的最后，USPA 教练会根据“单元概览”中列出的培训大纲主题和推荐读物（“参考资料”）进行口试。

Recommended plans (dive flows) for freefall and under canopy follow each outline. Notes for the supervising USPA Instructor are also found there.
培训大纲后面是建议的自由落体流程和开伞后流程（跳伞流程）。USPA 教练的注意事项也可以在那里找到。

Naturally, Category A includes the longest training outline, because there is a lot you must learn prior to making a first skydive. To improve retention, the school introduces only what you might need to know to make a first jump safely. Other important information can be presented as it becomes relevant and as you make a firmer commitment to learning more about the sport.
A 单元的培训大纲自然是最长的，因为在第一次跳伞之前学生必须学习很多东西。为了不消磨学生的积极性，学校只介绍为了学生能安全进行第一跳所需要了解的内容。其他重要内容会在学生更坚定学习跳伞的信念的时候教授。

AFF AND TANDEM「AFF 和双人伞」

- one jump　1 跳

IAD/STATIC-LINE「IAD 或 Static Line」

- two jumps　2 跳

RECOMMENDED MINIMUM DEPLOYMENT「建议最低开伞高度」

- AFF: 4,500 feet
  AFF：4500 英尺
- IAD and static line: 3,500 feet
  IAD 和 Static Line：3500 英尺
- Tandem: 5,500 feet
  双人伞：5500 英尺

Category at a Glance「单元概览」

ADVANCEMENT CRITERIA「晋级标准」

EXIT AND FREEFALL「出舱和自由落体」

AFF AND TANDEM STUDENTS「AFF 和双人伞学生」

- reasonable arch and stability within ten seconds prior to planned deployment altitude
  在到达计划的开伞高度之前的 10 秒内，保持恰当的弓形和稳定性
- reasonable altitude awareness
  合理的高度意识
- initiate deployment procedures within 1,000 feet of the assigned altitude
  在指定高度 1000 英尺内启动开伞流程

IAD AND STATIC-LINE STUDENTS「IAD 和 Static Line 学生」

- establish an arch and reasonable control after exit
  出舱后形成弓形姿态并进行合理控制

CANOPY「伞控」

- plan and execute canopy descent and landing pattern with assistance
  在协助下规划和执行降落伞飞行和着陆航线
- assisted flare for a safe landing within 60 degrees of correct landing direction
  在协助下刹车拉平以安全着陆，着陆方向应在正确着陆方向的 60 度范围内
- land within 330 feet of the planned landing area, spot permitting
  在计划着陆区的 330 英尺半径内着陆，如果场地允许的话

**Note: For reasons of safety, AFF, IAD, or static-line students who do not complete the flaring and landing advancement criteria on the first jump should be recommended for tandem or other comprehensive canopy training. If all other Category A advancement criteria have been met, the student may satisfy Category A canopy skills in another discipline and then advance to Category B in the preferred discipline.*

**注：出于安全原因，建议第一跳未达到拉平着陆晋级标准的 AFF、IAD 或 Static Line 学生进行双人伞或其他综合性跳伞培训。如果学生达到了所有其他 A 单元晋级标准，学生可能也满足了其他培训方法的 A 单元伞控技能，可以晋级至 B 单元并选择喜欢的培训方法。*

ORAL QUIZ「口试」

Book Stuff 参考资料

- FAR 91.107.a on seat belt use and responsibilities
  FAR 91.107.a 安全带的使用和责任
- SIM Section 2-1 G.3 on the topics to be covered in the first-jump course
  SIM 2-1 G.3 第一跳课程涵盖的主题

CATEGORY A: FIRST-JUMP COURSE OUTLINE「第一跳课程大纲」

I. SOLO: GENERAL SECTION「单人跳伞学习：通用知识」

Note: The needs of the operation will determine the order of presentation of the topics taught in the first-jump course. This section may be taught by a USPA Coach under the supervision of any USPA Instructor.
注：第一跳课程（首跳课程）中所教主题的教学顺序取决于具体操作的需求。本节（通用知识部分）可由 USPA 初级教练在任何 USPA 教练的监督下教授。

A. SOLO EQUIPMENT ORIENTATION「单人跳伞装备入门」

1. Location of all operation handles「所有操作把手的位置」
2. Equipment responsibilities「装备相关职责」
   a. In Category A, the USPA Instructor takes responsibility for putting your equipment on, adjusting it correctly, and checking it as follows:
      在 A 单元中，USPA 教练负责给学生穿装备，对装备进行正确调整，并在以下时候检查装备：
      (1) before you put it on
          学生穿上装备之前
      (2) before boarding
          登机前
      (3) in the aircraft shortly before exit
          出舱前
   b. IAD and static-line students check their deployment devices before climbing out of the aircraft.
      IAD 和 Static Line 学生在爬出机舱前应检查开伞装置。
   c. With the instructor's assistance, the student protects all operation handles while in and around the aircraft.
      在教练协助下，学生在登机前以及进入飞机后注意保护各个操作把手。
3. The altimeter indicates altitude in thousands of feet from the ground.
   高度表显示以千英尺为单位的离地高度。
   a. Handle with care
      小心地使用高度表
   b. Reads only approximate altitudes
      高度读数只是近似值
   c. Sometimes fails
      高度表有时会失效
   d. Use of the altimeter in freefall:
      自由落体时，高度表的使用：
      (1) Skydivers freefall about 1,000 feet in the first ten seconds and 1,000 feet every 5.5 seconds thereafter.
          跳伞者在出舱的前 10 秒内自由落体约 1000 英尺，此后每 5.5 秒自由落体 1000 英尺。
      (2) The altimeter needle moves backwards at approximately the same speed as the second hand of a clock.
          高度表指针向后移动的速度与时钟的秒针的速度大致相同。
      (3) Freefall students should check the altitude—
          自由落体时，学生应在以下时候检查高度—
          (i) after every task
              做完每个动作后
          (ii) whenever encountering difficulty in completing the current task
              一旦完成当前任务遇到困难时
          (iii) whenever uncertain of the altitude
              当不确定高度是多少时
          (iv) continually every few seconds
              每隔几秒钟不停看高度

(4) If you don't know the altitude, open the parachute.
如果无法知道高度是多少，就打开降落伞。

e. Static-line and IAD students count to keep track of the seconds after exit.
Static Line 和 IAD 学生出舱后在心中默默计数，以大致知道出舱后经过的秒数。

f. All students use the altimeter under canopy.
所有的学生都在降落伞打开后都要使用高度表。

g. Altitude awareness is the skydiver's most important task until the parachute opens.
在降落伞打开之前，保持高度意识是跳伞者最重要的任务。

4. Parachute opening occurs in three stages:
降落伞的打开分为三个阶段：

a. Activation—Deployment of the parachute begins once the container is opened (activated) in one of three ways:
激活阶段：一旦伞包通过以下三种方式之一被打开（被激活），降落伞的展开过程就会开始：
（译者注：跳伞者自行手动打开主伞的方式分为两大类，即下文所提的（1）拉索系统，以及（2）手抛式引导伞，其中（2）又分为两小类：第一小类是拉出式引导伞，即 Pull-out Pilot Chute，简称 POP，第二小类是抛出式引导伞，即 Throw-out Pilot Chute，简称 TOP。使用拉索系统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，这种开伞方式目前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。最常见的主伞开伞方式是抛出式开伞：跳伞者拉出引导伞，引导伞拉出关包针，从而释放主伞；其次为拉出式开伞：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）

(1) pulling the ripcord
拉动开伞拉索

(2) throwing the pilot chute
扔出引导伞

(3) static line
Static Line 辅助开伞

b. Deployment—The parachute comes out of the backpack.
展开阶段：降落伞从伞包里出来。

c. Inflation—The canopy fills with air.
充气膨胀：空气充满降落伞。

5. Within three seconds after activation, determine whether or not the canopy has deployed, inflated properly, and is controllable.
开伞流程开始后 3 秒内，应确定降落伞伞布是否已展开、充气是否正常、是否可控。

6. The open parachute canopy
开伞后的降落伞

a. To land safely, the parachute canopy must be regular in shape and controllable, and you must be able to reliably steer and flare the canopy for landing.
为了安全着陆，降落伞的形状必须是规则的、降落伞必须是可控的，并且必须能够可靠地操控方向，以及进行刹车拉平，以便进行着陆。

(1) rectangular (may be slightly tapered) canopy overhead with untangled lines
降落伞应为矩形（可能末端稍呈锥形），伞绳没有互相缠绕

(2) lines connecting to four straps above the jumper's harness, called risers
连接背带上方的四条系带，被称为组提带

(3) slider: a rectangular piece of fabric at the top of the risers
滑块布：组提带上部的一张矩形布

(i) moves down the lines during inflation.
滑块布在降落伞充气期间向下滑动。

(ii) slows and organizes the opening.
能使降落伞的打开过程更平缓且有组织。

(4) steering handles, called “toggles” or “brakes,” one on the back of each rear riser.
操纵把手，也称为“操纵棒”或“刹车棒”，位于各后组提带的背面。

b. Following a visual inspection, a canopy control check is completed after releasing the brakes (explained in the canopy piloting skills section).
目视检查降落伞后，拉出刹车，以完成降落伞可控性检查（在伞控技能部分中说明）。

B. FREEFALL POSITION「自由落体姿势」

1. Skydivers first learn to fall belly first into the wind.
跳伞者首先要学会腹部先迎风。
   a. Falling belly first results in a more reliable deployment of the parachute, worn on the back.
   腹飞可让背包式降落伞（位于背部）更可靠地打开。
   b. The airflow when exiting the aircraft comes from ahead.
   离开飞机时的气流来自前方。
2. Arching and extending the legs slightly results in better belly-first control; and relaxing the rest of the body results in smooth, on-heading fall.
弓形、稍微伸腿，这样可以更好地控制腹飞；身体其他部位放松，在下落过程中，朝向保持稳定。
   a. hips forward with back arched
   顶胯，背部弓形
   b. knees at shoulder width
   膝盖与肩同宽
   c. legs extended slightly, knees bent 45 degrees, toes pointed
   双腿微微伸展，膝盖弯曲 45 度，脚尖伸直
   d. upper arms positioned 90 degrees or less from the torso and relaxed
   上臂与躯干呈 90 度或更小的角度，且上臂要放松
   e. elbows bent 90-120 degrees, up, and relaxed
   肘部弯曲 90-120 度，向上，放松
   f. head up
   抬头
   g. practice until natural
   练习直到能自然做这个动作
3. Consciously breathing will help you relax.
有意识的呼吸会帮助学生放松。
4. Communications
与教练的交流
   a. Using hand signals (some examples are shown in SIM Appendix A), the instructor may coach you for a better body position and to improve awareness.
   通过使用手势信号（本书附录 A 中给出了一些例子），教练可指导学生作出更好的身体姿势和培养相关意识。
   b. Your method-specific instructor will introduce you to the signals he or she may use.
   学生所用培训方法（AFF、IAD、SL...）的教练将向学生介绍其可能使用的手势信号。
   c. You should respond to all adjustments smoothly and slowly and maintain the new position.
   作为对手势的回应，学生的身体姿态调整应该是平稳而缓慢的，并应保持新的姿势。

C. MAIN DEPLOYMENT「打开主伞」

FREEFALL「自由落体」

1. Establish belly-to-wind (arched) body position.
   建立腹部迎风（弓形）身体姿态。
2. Maintain the arch and locate the deployment handle.
   保持弓形并找到开伞把手的位置。
   a. If the deployment handle is mounted on the bottom of the container, look up while reaching for the handle.
      对于开伞把手在伞包底部的降落伞，在伸手抓开伞把手时要抬头向上看。
   b. Ripcords mounted more forward may allow you to look at the ripcord before reaching.
      对于开伞把手在伞包前部的降落伞（通过拉索开伞），可以先目视把手位置，然后伸手去抓。
   c. Regardless of location or technique, accentuate the arch while reaching for the activation handle.
      无论开伞把手位置在哪或使用何种技术，在伸手去抓开伞把手时，都要加强弓形。
3. For equal deflection of air (balance), stretch your left hand overhead and across as the right hand reaches for the deployment handle.
   为了身体左右两侧同等地偏转空气（保持平衡），当右手伸手抓开伞把手时，应将左手伸到头顶。
4. Activate (pull or throw) the handle vigorously, returning to the original position.
   用力启动（拉或扔）开伞把手，然后身体回到原来的姿态。
5. Verbalize each action, e.g., "Arch! Reach! Pull!"
   做每个动作时要喊出来，例如："弓形，抓，拉！"
6. Pull Priorities
   开伞的优先事项
   a. Pull—You must deploy the parachute
      必须开伞
   b. Pull at the proper altitude—You should maintain altitude awareness and pull at the assigned altitude.
      在合适高度开伞：应保持高度意识，在指定的高度开伞。
   c. Pull at the proper altitude while stable—The priority is to deploy the parachute at the assigned altitude. Deploying in a stable body position will help to reduce the chances of experiencing a parachute malfunction, but never sacrifice altitude for stability.
      在稳定状态下于合适高度开伞：首先要在指定的高度上开伞。在稳定身体姿态下开伞有助于减少降落伞故障的概率，但决不能为了稳定而牺牲高度。
7. After activation:
   开伞后：
   a. Remain flat, stable, and shoulders- level through deployment, counting to three by thousands.
      保持腹飞、稳定和肩膀平齐，数到 1003（1001、1002、1003）。
   b. After the count of three, visually check for pilot chute deployment.
      数到 1003 后，目视检查引导伞是否已正常释放。
      （*译者注：按 1001、1002、1003 计数，而不按 1、2、3 数的目的是为了避免计数过快*）

IAD AND STATIC LINE「IAD 和 Static Line」

1. As you exit the plane, remain arched, stable, and shoulders-level through deployment, counting to five by thousands.
   出舱后，保持弓形，稳定，肩膀平齐，数到 1005（1001—1005）。
2. Look over your shoulder for the pilot chute (if used) and main canopy deployment.
   视线越过肩膀看一下引导伞（如有使用引导伞的话）和主伞的开伞情况。

D. CANOPY PILOTING SKILLS「伞控」

1. Basic canopy aerodynamics
   降落伞空气动力学基础
   a. A ram-air canopy is an inflatable wing that performs like the wing of an airplane.

冲压式空气伞是一种可充气的翼伞，其作用类似于飞机的机翼。

(1) Once it is open and inflated, the canopy will start gliding forward and down through the air.
一旦打开并充气，降落伞就会开始在空中向前下方滑翔。

(2) The forward movement creates a flow of relative wind around the canopy.
向前运动时，降落伞上下表面产生相对气流。

b. The airflow around the canopy creates lift.
相对气流产生升力。

2. Steering the canopy「降落伞的控制」

a. With both toggles all the way up, the canopy should glide straight ahead at full speed.
当两个刹车棒都在最上面时，降落伞会全速向前滑翔。

b. The canopy turns right when you pull the right toggle (steering control line handle) down and turns left when you pull the left toggle down.
拉右刹车时，降落伞向右转，拉左刹车时，降落伞向左转。

c. To prevent a collision with another jumper, always look first in the direction of the intended turn.
为防止与另一名跳伞者发生碰撞，转向前应先朝打算转向的方向看。

d. The canopy will turn as long as one toggle is held down and stops turning when it is let up.
拉下一边刹车，降落伞就会转向，刹车松上去时，降落伞就会停止转向。

e. Pulling one toggle down a small amount produces a slow turn with a relatively small amount of dive.
将一边刹车微微下拉，降落伞会缓慢转向，并带有轻微的向下俯冲。

f. Small toggle inputs can be used to make minor heading corrections at any point in the canopy flight.
较小的刹车量可用于在降落伞飞行的任何时间点进行方向微调。

g. Pulling one toggle down farther will produce a faster turn and causes the canopy to dive, which can have serious consequences near the ground.
较大的刹车量将导致更快的转向，并导致降落伞突然向下俯冲，在地面附近这么做会导致严重后果。

h. Pulling both toggles down decreases the rate of descent and forward speed of the canopy.
同步拉下两边刹车可降低降落伞的下降速度和前进速度。

3. Post-deployment canopy check
开伞后的降落伞检查

a. Check the canopy for proper inflation after the deployment.
检查降落伞开伞后是否正确充气。

(1) The canopy should be large and fully inflated.
降落伞应该显得很大，并且完全充气。

(2) The canopy should have four well-defined edges forming a rectangular shape.
降落伞应该有四个清晰的边缘轮廓，形成一个矩形。

(3) The suspension lines should cascade down in four neat line groups to each riser, the slider should be down to the tops of the risers, and the canopy should be flying wing-level toward the horizon, without spinning or turning. (Stable)
伞绳悬挂线应整齐地汇聚成四组并向下连接至四个组提带，滑块布应位于组提带顶部，降落伞伞翼应水平，并笔直向前朝地平线飞行，不得带有螺旋机动或转弯（稳定）。

b. Grab the steering toggles and perform a control check to ensure the canopy will steer and flare.
握住刹车，并执行降落伞可控性检查，以确保降落伞能够正常转向和刹车拉平。

(1) Release the brakes by pulling both toggles down smoothly to the belly and raise back up to full flight.
释放刹车，将两个刹车棒平稳地拉至腹部，然后松回原位（***译者注：这里的“松”不是指手放开刹车，而是把刹车放回上方，刹车棒应始终紧握手中，下同***），直到降落伞恢复全速飞行。

(2) Look to the right to ensure clear airspace and pull the right toggle smoothly down toward the belly to initiate a right-hand turn and continue the turn for at least 90 degrees before returning the toggle all the way up to resume straight and level flight.

向右看以确保空域畅通，拉右刹车至腹部以开始右转，并继续转至少 90 度，然后向上松回去，以恢复平直飞行。

(3) Look to the left to ensure clear airspace and pull the left toggle smoothly down toward the belly to initiate a left turn and continue the turn for at least 90-degrees before returning the toggle all the way up to resume straight and level flight
向左看以确保空域畅通，拉左刹车至腹部以开始左转，并继续转至少 90 度，然后向上松回去，以恢复平直飞行。

(4) Pull both toggles down smoothly all the way to full arm extension to flare the parachute, then smoothly return the toggles back to the full up position for a full glide, straight and level flight.
平稳地同步地拉下两边刹车，直至手臂完全伸直，这将使降落伞拉平，然后平稳地把刹车完全松回去，恢复全速滑翔、平直飞行。

(5) To be considered a good main canopy, it should turn and flare correctly and fly in a straight direction with the toggles in the full up position.
正常的主伞应该能够正确地转向和拉平，且两边刹车棒完全松开时能直线飞行。

4. Canopy speed and wind「降落伞的速度与风」
   a. When facing into the wind or "holding," the canopy will fly more slowly across the ground.
   逆风时，降落伞相对地面会飞得较慢。
   b. When flying in the same direction as the wind, or "running," the canopy will move more quickly across the ground.
   顺风时，降落伞相对地面会飞得较快。
   c. When facing perpendicular to the wind or "crabbing," the canopy will move forward and also drift sideways across the ground.
   当降落伞的方向垂直于风向，或"侧风"时，降落伞在向前移动的同时也会相对地面横向漂移。
   d. These effects become more pronounced in stronger winds.
   在强风中，这些效果会更明显。
5. Landing patterns「着陆航线」
   a. Each jumper is responsible for landing safely in a clear area.
   跳伞者应在空旷的地方安全着陆。
   b. Prior to boarding the aircraft before each jump, you should plan your landing pattern using an aerial photograph, diagram, map, or model of the drop zone.
   每次跳伞登机前，应利用航拍图、降落区示意图、地图或降落区模型来规划着陆航线。
   c. Determine the current speed and direction of the wind.
   应确定当前的风速和风向。
   d. Locate the intended target and determine the wind line, which is an imaginary line going through the target indicating the direction of the wind.
   找到着陆目标点，确定风线。风线是一条经过着陆目标的虚拟风向线。
      (1) If the canopy is upwind of the target, the wind will tend to push the canopy toward the target.
      如果降落伞在着陆目标的上风处，风会趋于把降落伞推向着陆目标。
      (2) if the canopy is downwind of the target, the wind will tend to push the canopy away from the target.
      如果降落伞在着陆目标的下风处，风会趋于把降落伞推离着陆目标。
   e. In no-wind conditions or light and variable winds, the instructor and student should choose a predetermined landing direction and base the landing pattern on that plan.
   在无风、微风以及风向多变的条件下，教练和学生应预定一个着陆方向，并根据该着陆方向确定着陆航线。
   f. Choose a point on the ground downwind of the landing target and on the wind line where you will start your final approach at 300 feet.
   在着陆目标下风处的风线上选择一个点，300 英尺的时候从这个点开始最后进近（第三边）。
   g. Choose the point where you will start your base leg at 600 feet.

选择一个点，600 英尺的时候从这个点开始走基线边（第二边）。

h. Choose the point where you will start your downwind leg at 1,000 feet.
选择一个点，1000 英尺的时候从这个点开始走下风边（第一边）。

i. The location of each point and shape of the pattern will vary depending on the strength of the wind.
每个点的位置和着陆航线的形状应根据风力的强弱进行调整。

(1) In light winds, the pattern will resemble a square, with the downwind leg, base leg, and final approach being the same length.
在微风中，着陆航线类似正方形，第一边（下风边）、第二边（基线边）、第三边（最后进近）的长度相同。

(2) In light winds it is important to have plenty of clear space past the target in case you overshoot.
在微风中，应在着陆目标的后方预留足够的空旷区域，以在进高时能落在空旷区域。

(3) As the winds become stronger, the final approach and base legs become shorter, and the downwind leg becomes longer.
随着风力增强，第三边和第二边变短，第一边变长。

(4) In strong winds, it is important to make the base leg and final approach turns over a clear area, in case you land short of the target.
在强风中，走第二边和第三边时应保持在空旷区域上方，以在飞不回着陆目标时能落在空旷区域。

j. Determine the shape and location of the holding area; this is ideally where you should be when the canopy opens, and where you should remain for most of the canopy flight.
确定等待区的形状和位置；当降落伞打开时，等待区是学生应该处于的理想位置，且在降落伞飞行的大部分时间里学生都应该留在等待区。

Note: The USPA Instructor may need to adjust the shape of the pattern or the checkpoint altitudes to account for various circumstances.
注：USPA 教练可能需根据需要调整着陆航线的形状或参考点的高度，以适应不同情况。

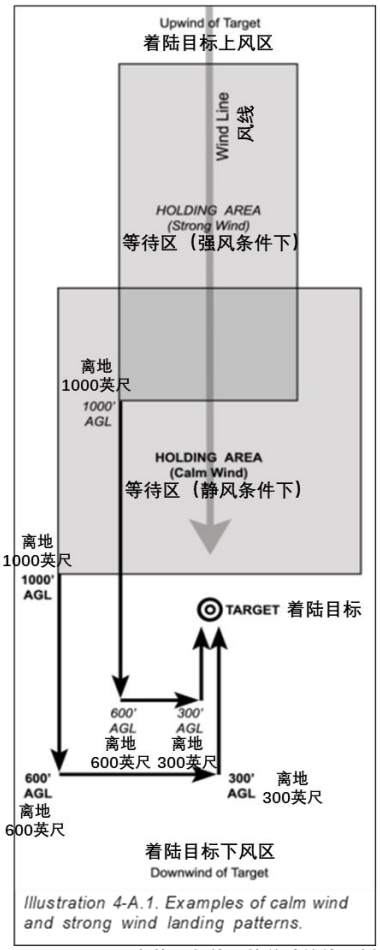

Illustration 4-A.1. Examples of calm wind and strong wind landing patterns.
图4-A.1 强风和静风条件下的着陆航线示例

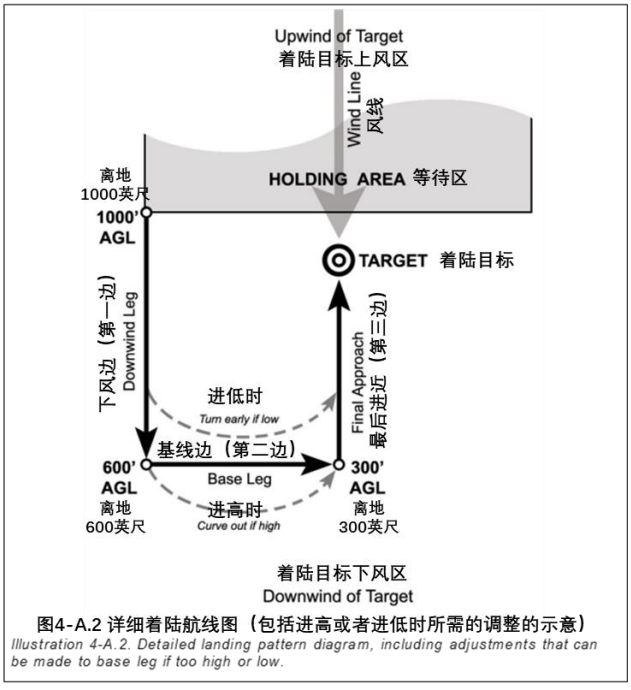

图4-A.2 详细着陆航线图（包括进高或者进低时所需的调整的示意）
Illustration 4-A.2. Detailed landing pattern diagram, including adjustments that can be made to base leg if too high or low.

6. Normal canopy flight procedures「正常的降落伞飞行程序」
   a. After checking for a good canopy, check your altitude then look directly below your feet and observe your position over the ground.
      开伞后确认降落伞状态良好后，检查高度，然后直视脚下，观察当前对应的地面位置。
   b. Locate your holding area, target, and the "check points" where you will start each leg of your pattern, and establish a line to your preplanned 1,000-foot pattern entry point.
      找到等待区、着陆目标、以及着陆航线参考点（即第一边、第二边、第三边的起点），并确定一条延伸至 1000 英尺着陆航线起始点的直线。
   c. Divide the line logically according to the remaining altitude (halfway down, halfway back); for example, if open at 4,000 feet
      根据剩余高度合理划分这条直线（掉一半高度，走一半路程）；例如，如果在 4000 英尺高度开伞：
      (1) Divide the line in half and remain over the first half of the line until 2,000 feet.
          将直线划成两段，在直线的前半段内飞行，直到 2000 英尺。
      (2) Fly over the remaining half of the line until reaching the pre-planned pattern entry point at 1,000 feet.
          在剩余的半段直线上飞行，直至到达预先计划的 1000 英尺着陆航线起始点。
   d. Remain inside the holding area until 1,000 feet.
      在等待区内飞行，直到 1000 英尺。
   e. As long as you are in the holding area and above 1,000 feet, you may practice turns and flares.
      在等待区，且在 1000 英尺以上时，可以练习转向和拉平。
   f. Watch for other canopies, check your altitude, and check your position over the ground periodically, especially after each turn or practice flare.
      注意其他的降落伞，检查高度，每隔一段时间检查相对地面位置，尤其是在每次转向或拉平练习后。
   g. Begin your pattern at 1,000 feet, flying to each of the checkpoints you picked on the ground.
      在 1000 英尺高度开始飞着陆航线，飞至各事先选定的参考点。
      (1) You may need to begin your base leg turn at 600 feet even if you have not arrived at the planned checkpoint.
          在 600 英尺处，即使尚未到达预定的第二边参考起点，也可能需要开始转入第二边。
      (2) If arriving too high at the planned 600-foot checkpoint, correct by looping out during the base leg on the way to the 300-foot point.
          如果到达计划的 600 英尺参考点时的高度太高，则应在第二边飞往 300 英尺参考点的途中往外拐一点，以进行调整。
7. Final approach and landing「最后进近和着陆」
   a. Once you have begun your final approach, your main priority is to keep the canopy flying straight toward a clear, open area.
      一旦开始最后进近，首要任务就是让降落伞直飞，并朝着空旷开阔的区域飞行。
      (1) Small toggle inputs may be used to avoid obstacles on the ground.
          可用刹车棒微调以避免地面障碍物。
      (2) If the canopy begins to drift, use the appropriate input to stop the turn and keep the canopy flying straight toward a clear area.
          如果降落伞开始偏航，可适当地控制降落伞，以停止转向，并保持降落伞笔直地朝空旷区域飞行。
      (3) The best way to avoid obstacles is to always look towards a clear area and guide the canopy towards a clear landing spot, rather than focusing on an obstacle.
          避免障碍物的最好方法是始终朝着一个空旷的区域看，并引导降落伞朝着空旷地着陆点飞行，而不是把注意力放在障碍物上。
   b. If the canopy is flying straight, keeping the toggles all the way up in the full glide position will help the canopy produce more lift when you flare.

如果降落伞是直线飞行，将刹车棒保持在全速滑翔的位置，这有助于降落伞在拉平时产生更多的升力。

c. It is easier to judge the flare height by looking mid-way towards the horizon rather than straight down below your feet.
判断拉平高度的更容易的方法是看向下方与地平线之间的中间点，而不是直接往脚下看。

d. During the last part of the final approach, put your feet and knees together in a PLF position.
在最后进近时，把膝盖和腿并拢，作出 PLF 姿势。

e. Just before landing, convert the forward speed of the parachute to lift by flaring.
着陆前一刻，通过拉平将降落伞的前进速度转换为升力。

(1) When your feet are approximately twice your height above the ground, flare to half brakes.
当脚离地高度大约是身高两倍时，拉平到半刹车位置。

(2) Flare the remainder of the way just before touching down.
在触地前，把刹车棒剩下的行程拉完。

(3) Your instructor may vary the exact flare technique based on the type of canopy you will be using or other factors.
教练可能会根据学生使用的降落伞类型或其他因素调整拉平的技巧。

f. If you start the flare too high, stop flaring and hold the toggles where they are.
如果刚开始拉平的高度太高，应停止拉平，并保持刹车棒的位置，不放回去。

(1) Letting the toggles up abruptly causes a steep dive.
如果突然松开刹车棒会导致突然俯冲。

(2) Keep looking ahead and keep the canopy flying straight.
继续向前看，保持降落伞直线飞行。

(3) Push the toggles the rest of the way down before touching down.
在触地前拉完剩余的刹车棒行程。

Note: Beginners should jump large, docile canopies that allow for errors. These canopies should be resistant to stalling and should simply maintain a low airspeed and rate of descent if flared too high.
注：初学者应该使用面积大的，性能温和的，容错率大的降落伞。且降落伞应能抵抗失速，如果拉平高度太高，降落伞应能够保持较低的空速和下降速度。

g. You should be prepared to perform a parachute landing fall (see Illustration 4-A.3) every time you land.
每次降落时都应该准备好 PLF（见图 4-A.3）。

h. A stand-up landing should only be attempted if you touch down softly and are confident that you can comfortably remain on your feet.
只有当轻触地面，确信可以舒适地保持双脚站立时，才应尝试站立着陆。

8. Perception of speed「速度感知」

a. The canopy may seem to fly very slowly until you get lower on final approach.
在降至较低高度，开始最后进近之前，降落伞可能看起来飞得比较慢。

b. You may notice the speed for the first time at this point, which may trick you into flaring early.
此后，你可能会感到速度变快，这可能会诱使你提前拉平。

c. The canopy needs speed for an effective flare.
降落伞需要足够的速度才能有效地拉平。

d. Wait until the correct altitude to flare.
应等到正确的高度再拉平。

9. Changing winds「变化的风」

a. Landing into (against) the wind is desirable, but not absolutely necessary.
逆风降落是好的，但不是必须的。

b. Use available wind indicators to check the wind direction during your canopy flight.
在降落伞飞行期间，应通过可用的风向标确定风向。

(1) On days when the winds are light and variable, it may be best to maintain your original, planned pattern

and landing direction even if the wind indicators change direction.
在风速低且风向多变的情况下，即使风向标改变方向，也最好保持原来的计划航线和着陆方向。

(2) If it is necessary to land in a different direction than planned, rotate your original pattern around the target so it lines up in the desired direction.
如果需要以不同于计划的方向着陆，应将原着陆航线以着陆目标为中心旋转，使其匹配新的着陆方向。

c. Once you have begun your final approach, keeping the canopy flying straight toward a clear area is more important than landing directly into the wind.
一旦开始最后进近，保持降落伞笔直朝着空旷区域飞行比逆风降落更重要。

d. Landing downwind or crosswind in a clear area is far less risky than making an aggressive turn near the ground.
在空旷区域顺风或侧风着陆的风险远小于在地面附近进行较大转向的风险。

10. Alternate landing areas「备降场地」

a. Whether you land in the intended landing area or an alternate one, you should be prepared to make your own correct decisions and land safely without assistance.
无论是在预定着陆区着陆还是在备降场着陆，都应该做好准备，在没有帮助的情况下做出正确的决定，并安全着陆。

b. If you are not in your holding area or close to it when the canopy opens be prepared to pick an alternate landing area.
如果降落伞打开后，位置不在等待区内或离等待区很远，应准备选一个备降场。

c. Maintain altitude awareness while flying back towards your 1,000-foot point.
在飞回 1000 英尺高度参考点的过程中，保持高度意识。

d. At or above 2,000 feet you should decide whether or not you will be able to reach your 1,000-foot point.
在 2000 英尺或以上时，应确定是否能够抵达 1000 英尺点参考点。

e. If it is obvious that the 1,000-foot point is unreachable:
如果明显无法抵达 1000 英尺参考点：

(1) Look for your 600-foot and 300- foot points.
找到 600 英尺参考点和 300 英尺参考点。

(2) 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.
如果确信能到达其中一个参考点，则朝它飞去并保持在那个参考点上方，直到开始走对应边的正确高度。

(3) If it is obvious that you will not reach any point in your pattern by the correct altitude, then plan to land in a nearby open area, free of obstacles.
如果明显无法在正确的高度到达着陆航线的任何参考点，那么应计划降落在附近的没有障碍物的开阔区域。

(4) Visually transfer the intended landing pattern to the new landing area.
将预定着陆航线平移到新的着陆区域。

(5) Fly the new landing pattern.
然后使用新的着陆航线。

f. Any time you must land in an alternate area off of the airport property:
如果不得不在场外着陆：

(1) Look carefully for obstacles and avoid them by looking and steering the canopy towards a clear and open area.
仔细注意哪里有障碍物，并目视开阔空旷的区域，控制降落伞飞往这个区域，以避开障碍物。

(2) Perform a parachute landing fall (PLF).
做 PLF。

(3) Wait for assistance or further instructions.

等待帮助或进一步指示。

(4) Be polite to property owners.
对土地的所有者要礼貌。

11. Priorities for all landings
所有着陆的优先事项

a. Land with the wing level and flying in a straight line.
降落伞伞翼水平，降落伞直线飞行

b. Land in a clear and open area, avoiding obstacles.
降落在空旷开阔的地方，避开障碍物。

c. Flare to at least the half-brake position.
至少拉平到半刹车位置。

d. Always be prepared to make a PLF.
总是准备做 PLF。

E. BASIC LANDING TRAINING – PARACHUTE LANDING FALL「基本着陆训练—着陆缓冲（PLF）」

1. Parachutists absorb the shock of a hard landing with a Parachute Landing Fall (PLF).
跳伞者用着陆缓冲（PLF）来吸收硬着陆的冲击力。

a. To prepare for a PLF, press your feet and knees together with your knees slightly bent.
准备 PLF 时，把膝盖和脚并拢，膝盖稍微弯曲。

b. Flare the canopy completely with both hands together and close to the front of your body to help prevent wrist and hand injuries.
用双手使降落伞完全拉平，且双手互相靠近，紧贴身体前部，这样有助于防止手腕和手部受伤。

c. Chin to the chest to help prevent neck injuries.
下巴抵住胸部，这样有助于防止颈部受伤。

d. Allow your feet to make contact with the ground first.
让脚先接触地面。

e. Maintain the PLF position throughout the entire landing roll.
在整个着陆翻滚过程中保持 PLF 姿势。

f. As your feet touch the ground:
当脚接触地面时：

(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，身体一侧向下滚动。

(2) Lay over to the side of one calf.
然后小腿触地。

(3) Continue to roll to the thigh on the same side.
继续由同侧大腿触地翻滚。

(4) Continue rolling on to that hip (side of the butt).
继续滚到臀部（臀部侧面）。

(5) Roll diagonally across your back to the opposite shoulder.
斜着滚动，由背部滚到身体另一侧肩部。

(6) 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。

2. The PLF position is also the proper way to prepare for a stand-up landing.
PLF 姿势也是为站立着陆做准备的正确方式。

a. The PLF position keeps your weight balanced in the harness and helps avoid the tendency to reach for the ground.
PLF 姿势使你的重量均衡分配在背带上，有助于避免触地的倾向。

b. If you touch down softly you can step out of the PLF position and remain on your feet.
如果触地很轻，可以退出 PLF 姿势，并保持用脚站立。

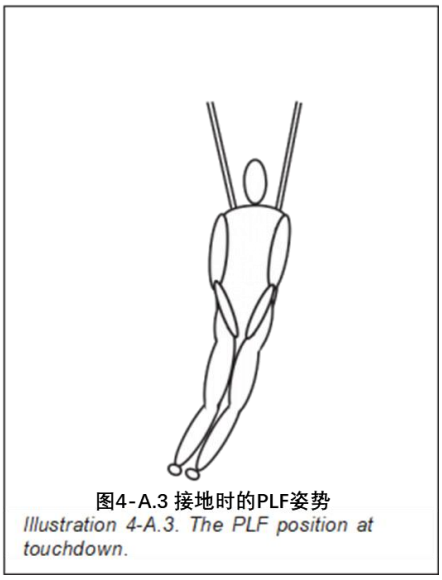

图4-A.3 接地时的PLF姿势
Illustration 4-A.3. The PLF position at touchdown.

F. LANDING HAZARDS (AT TRAINING HARNESS)「着陆危险障碍物（使用训练背带练习）」

1. Landing hazards include water, trees, buildings, power lines, and any similar hazards.
着陆危险障碍物包括水面、树木、建筑物、高压线等类似危险障碍。
2. These hazards can usually be avoided by:
这些危险障碍物通常可以通过以下方式避免：
   a. Properly preparing for the canopy flight by observing the winds and planning an appropriate landing pattern before boarding the aircraft.
   在登机前，观察风向，规划适当的着陆航线，为降落伞飞行做好准备。
   b. Choosing the correct exit and opening points and spotting the aircraft correctly before exiting.
   选择正确的出舱点和开伞点，并在出舱前正确定位飞机位置。
   c. Following the procedures described above under “Alternate landing areas.”
   遵循上述“备降场地”中所述的流程。

WATER「水降」

1. Refer to the USPA BSRs for equipment requirements on jumps near water, but many drop zones have waivers on file.
有关在水域附近跳伞的装备要求，请参阅 USPA 基本安全要求（BSR），但许多跳伞基地都已备案相关基本安全条件的豁免。
2. Procedure for an unintentional water landing:
意外在水上降落的流程：
   a. If possible, land close to shore or to a boat, buoy, or other floating object.
   如有可能，在靠近海岸或船只、浮标等其他漂浮物的区域着陆。
   b. Inflate the flotation device (if available).
   给漂浮装置充气（如有）。
   c. Loosen the chest strap (keep your hands in the steering toggles to maintain control if possible; however, this may require taking your hands out of the steering toggles first).
   松胸带（手应尽可能一直握着刹车棒以保持对伞的控制；但本步骤可能需要手先放开刹车棒）。
   d. Enter the water with lungs full of air.

落水之前深吸气。

e. Releasing the main canopy and attempting to fall away into the water is not recommended.
不建议切掉主伞来试图掉入水中。
   (1) Altitude above water can be difficult to judge.
   相对水面的高度很难判断。
   (2) Falling from a significant height into water can result in fatal injuries
   从高处坠入水中会造成致命伤害
   (3) The water may be shallow or there may be unseen objects below the surface.
   水可能很浅，水面下也可能有看不见的物体。

f. Prepare for a PLF.
准备做 PLF。

g. Flare the parachute to half brakes at ten feet above the water (may be difficult to judge) and enter the water feet-first in a PLF position.
在水面以上 10 英尺处时（可能很难判断）拉平到半刹车位置，然后以 PLF 姿势脚部首先进入水面。

h. If the canopy lands on top of you:
如果降落伞盖在身上：
   (1) dive down and swim out from under the canopy, or
   向下潜水，游泳离开降落伞，或
   (2) pull the canopy off of your head, remaining clear of the lines.
   把降落伞伞布从头上拉走，不要碰到伞绳。

i. Take a deep, full breath of air at every opportunity.
只要有机会呼吸，都要深吸气。

j. Release or slide off the leg straps and swim carefully away to avoid entangling in the suspension lines.
松开或滑出腿带，小心地游走，以免缠绕在伞绳悬挂线上。

k. Even if you are in shallow water or are a strong swimmer, leave the parachute system behind.
即使是在浅水区，或者你的游泳能力很强，也要把降落伞抛弃在身后。

Trees「树降」

1. Most tree landings are survivable, but accidents may also occur during the recovery.
大多数情况下降落在树木上是可以活下来的，但在解救过程中也可能发生事故。
2. Continue steering to avoid trees but avoid sharp turns near the ground.
通过转向避开树木，但避免在地面附近急转弯。
3. Procedures for landing in a tree:
在树上降落的流程：
   a. Flare to half brakes.
   拉平到半刹车位置。
   b. Keep your legs tight together in a PLF position, but not crossed.
   双腿并拢，保持 PLF 姿势，双腿注意不要交叉。
   c. Protect your face with both hands and forearms, with both elbows tightly together and close to your stomach.
   用双手和前臂保护脸，两个手肘紧靠在一起并靠近胸腹部。
   d. Try for the middle of the tree, then hold on to the trunk or main branch to avoid falling.
   试着对准树的中间，然后抓住树干或主要枝干，以免摔下去。
   e. Prepare for a hard landing on the ground if falling through the tree.
   如果从树上掉下来，准备在地面硬着陆。
   f. Stay in the tree and wait for help; do not attempt to climb down.
   呆在树上等待救援；不要试图爬下去。

BUILDINGS「建筑物上降落」

1. A jumper could land into the side of a building or on top of it.
   跳伞者可能会降落在建筑物的侧面或顶部。
2. Make slight steering corrections to avoid the building or object, but stop any turns in time to prepare to land.
   应微调转向，避开建筑物或其他危险物体，但在准备着陆时应及时停止任何转弯。
3. Procedures for landing in or on a building:
   建筑物上着陆的程序：
   a. When landing on top of a building, prepare for a hard landing utilizing a Parachute Landing Fall (PLF) position.
      在建筑物顶部着陆时，使用 PLF 姿势准备硬着陆。
   b. Flare at ten feet above the building.
      在建筑物上方 10 英尺处拉平。
   c. Strike the object feet first.
      用脚先接地。
   d. After landing on top of a building in windy conditions, pull the cutaway handle to prevent being dragged off the building.
      在有风的情况下，在建筑物顶部着陆后，拉动切伞把手，以防被主伞拖下建筑物。
   e. When striking the side of a building, try to strike it in a PLF position feet first, then the side of your body with a glancing blow, if possible.
      当撞击建筑物的侧面时，试着先以 PLF 姿势用脚先撞击建筑物，如果可能的话，再以身体的侧面撞击。
      (1) Make slight steering corrections or turn your body to the side in your harness.
          轻微修正方向，或者把身体转向背带的一侧。
      (2) Flare to half brakes.
          拉平到半刹车位置
      (3) Protect your face and vital organs while keeping a proper PLF position in anticipation of a secondary impact.
          保护面部和重要器官，同时保持适当的 PLF 姿势，做好二次撞击的预期和准备。

POWER LINES「高压线」

1. Power lines typically appear along roads, between buildings, and along straight-line paths through wooded areas.
   高压线通常是在道路上、建筑物之间以及穿过树木繁茂地区的直路上。
2. They may be invisible, except for their poles.
   电线可能很难看见，但电线杆可能比较明显。
3. Power lines can be extremely dangerous: if there is no other alternative, landing in trees, in water, or on a small obstacle may be preferable to landing in power lines.
   高压线可能非常危险：如果没有其他选择，不得不落在危险区域，那么选择落在树上、水上，或小障碍物上可能比落在高压线上更可取。
4. Sharp turns close to the ground can be equally dangerous, so it is important to identify power lines and steer clear of them while enough altitude remains to do so safely.
   在地面附近急转弯也同样危险，因此，在有足够的高度可以保证安全的情况下，应辨清高压线并转弯避开它们。
5. Procedure for landing in a power line:
   高压线上着陆的流程：
   a. Drop any ripcords.
      扔掉所有的降落伞拉索。
   b. Pull both toggles to the halfway position, prepare for a hard landing, and turn your head to one side. (With a round reserve canopy, place your hands between the front and rear risers on each side.)
      把两个刹车棒都拉到中间位置，准备硬着陆，然后把头转向一侧。（当使用圆形备伞时，将两边的手都放在前组提带和后组提带之间。）

c. Touch no more than one wire at a time.
一次只能接触一根电线。

d. If suspended in the wires: the parachute can conduct electricity, so the power needs to be off before making contact with anyone or anything on the ground.
如果悬挂在电线上：降落伞可能导电，所以在与地面上的任何人或任何东西接触之前，必须切断电源。

ANY OBSTACLE LANDING「各类障碍物」

1. Remain still and keep your helmet on.
保持冷静，头盔要一直戴着。
2. Prepare to drop the rest of the way to the ground at any moment.
随时准备可能会掉到地上。
3. Wait for competent, knowledgeable help (drop zone staff) for help in getting down.
等待有能力、有相关知识的人（跳伞基地工作人员）来救援，以从障碍物上下来。

LANDING OFF FIELD「场外降落」

1. Steer for a clear area
控制降落伞飞向空旷区域
2. Transfer the planned landing pattern to the new, clear area.
将计划着陆航线平移到新的空旷区域。
3. Look for and avoid obstacles.
寻找并避免障碍物。
4. Perform a PLF.
执行 PLF。
5. Wait for assistance or further instructions.
等待帮助或进一步指示。
6. Be polite to property owners.
对土地的所有者要有礼貌。

RECOVERING THE CANOPY IN HIGHER WINDS「地面大风时的收伞」

1. Land using a PLF.
PLF 着陆。
2. Get up quickly and attempt to run toward the canopy until it collapses.
迅速起身，跑向降落伞，直到降落伞塌缩。
3. Pull in one toggle and steering line to assist in collapsing the canopy (especially if being dragged).
拉下一边的刹车棒和刹车线，这样有助于降落伞塌缩（尤其是在被降落伞拖动的情况下）。
4. Cut away the canopy as a last resort or if injured, but wait for assistance before walking anywhere.
作为最后的手段，或者如果受伤了，可执行切伞，但是在移动到其他地方之前要等待帮助。

ROUND CANOPY (RESERVE USE ONLY) 「圆伞（仅用作备伞）」

1. Round canopies have vents in the rear to enable forward speed (less than ten mph).
圆形降落伞后部有通气孔，以能够前进（速度低于 10 英里/小时）。
2. Steer the canopy using the back risers or, if rigged on two risers only, the steering lines.
使用后组提带控制转向，或用转向线控制降落伞转向（如有）。
3. Steer across or with the direction of the wind toward a clear area.
侧风或顺风飞行到开阔地带。
4. Steer into the wind at 200-300 feet before landing and continue steering to avoid obstacles.
着陆前在 200-300 英尺高度处转向至迎风，并继续控制方向以避开障碍物。

5. Prepare to land using the PLF.
   准备 PLF 着陆

G. EQUIPMENT PROBLEMS (AT TRAINING HARNESS)「装备故障（使用训练背带练习）」

1. For a parachute to be safe to land it must be:
   降落伞要能安全着陆，必须符合以下条件：
   a. "There," meaning deployment has occurred and something is overhead.
      "在那里"，即已开伞，并且伞在头顶上方。
   b. "Square," meaning that the parachute is inflated, rectangular (or slightly tapered), and regular in shape.
      "矩形的"，即降落伞已充气，呈长方形（或伞两端略缩），且形状规则。
   c. "Steerable," meaning that you can turn left and right and flare.
      "可操纵"，即可以左右转向和拉平。
   d. In the event of a toggle malfunction, the rear risers may be used for steering and flaring the canopy.
      在发生刹车棒故障的情况下，可以用后组提带控制降落伞转向和拉平。
      (1) Landing by flaring with rear risers should be practiced at sufficient altitude before attempting an actual landing with rear risers.
          在尝试使用后组提带进行实际着陆之前，应在足够的高度上使用后组提带进行拉平着陆练习。
      (2) Flaring with rear risers will require more strength than flaring with just the toggles.
          使用后组提带拉平比仅使用刹车棒拉平需要更用力。
2. If the parachute fails any of the above tests, you must initiate reserve parachute procedures.
   如果降落伞未能通过上述任何一项测试，就必须启动备伞程序。
3. Decide if the parachute is controllable and ready to land by 2,500 feet; otherwise, execute the planned emergency procedures.
   在下降到 2500 英尺之前，必须确定降落伞是否可控；否则，执行计划的紧急程序。
4. Routine problems in order of correction:
   常见问题的纠正顺序：
   a. To find a missing deployment handle, first find its location on the system (two additional tries).
      如果摸不到开伞把手，首先在它原本的位置寻找（尝试两次）。
      (1) For bottom of container location, feel across the bottom of the back pack to the corner; then down the side to the corner, then go to reserve.
          对于开伞把手在伞包底部的情况，从伞包底部摸到拐角处；然后再沿着伞包侧面摸到拐角处，如果还是找不到，则打开备伞。
      (2) For ripcord handle mounting on the harness, locate that part of the harness or harness intersection; if that fails after two tries, go to reserve.
          对于安装在背带上的开伞拉索把手，定位把手在背带上的位置或连接处；如果两次尝试都失败了，就打开备伞。
   b. For a stuck main deployment handle, try again twice with both hands, if possible, then deploy the reserve.
      对于卡住的主伞开伞把手，如有可能，用双手再试两次，然后再开备伞。
   c. To clear a pilot chute hesitation (burble), twist at the waist and look over your shoulder to change the airflow.
      如果发生引导伞迟滞（引导伞滞留于背部涡流中），应扭动腰部，视线越过肩膀往上看，以改变气流。
   d. To untwist the lines, spread the risers and kick, but release the brakes only after clearing the twist.
      如果发生线缠绕，应拉开组提带并踢腿，刹车棒只能在线缠绕解决后释放。
   e. To bring down a stuck slider, depress the toggles to the flare position and pump them.
      如果滑块布卡住，应将刹车棒拉到拉平位置并反复拉动。
   f. To open the end cells, depress the toggles to the flare position and hold them.
      如果末端气室充气不完全，应将刹车棒拉到拉平位置并保持。
   g. If the canopy has opened normally but turns on its own, be sure both brakes are released.

如果降落伞正常打开但自行转弯，应确保两个刹车棒都已释放。

h. Broken lines, rips, other canopy damage, or pilot chute entangled in the lines: Determine by 2,500 feet whether the canopy is steerable and flares without problems.
对于伞绳断裂，降落伞撕裂，其他降落伞损坏的问题，或者引导伞缠绕伞绳的情况：应在 2500 英尺以上确定降落伞是否可控，是否能正常拉平。

H. EQUIPMENT EMERGENCY PROCEDURES「装备紧急程序」

TOTAL MALFUNCTION「完全故障」

Note: Some schools teach partial malfunction procedures as an alternative to the following procedures for when the parachute has been activated but has failed to deploy.
注：一些学校教授部分故障的处理程序来替代降落伞启动但未能打开时的处理程序（如下所示）。

1. Return to the arch position.
回到弓形姿势。
2. Ripcord systems: Discard the main ripcord if extracted.
对于使用拉索系统的降落伞：如果已拉出主伞开伞拉索，应将其丢弃。
3. Look for and locate the reserve ripcord handle.
看并找到备伞开伞拉索把手（备伞把手）位置。
4. Pull it all the way out to activate the reserve parachute.
把它拉出来启动备伞。
5. Arch and check over the right shoulder for reserve pilot chute deployment.
做弓形，视线越过右肩检查备伞引导伞的释放情况。

PARTIAL MALFUNCTION「部分故障」

Note: On single-operation systems, pulling the reserve ripcord releases the main canopy first before deploying the reserve. Partial malfunction procedures for a single-operation system (SOS) are the same as for a total malfunction.
注：在单把手紧急系统（SOS）中，拉动备伞开伞拉索会先切断主伞再打开备伞。单把手紧急系统的部分故障处理程序与完全故障处理程序相同。

1. Check altitude.
检查高度。
2. Return to the arch position.
回到弓形姿势。
3. Ripcord systems only: Discard the main ripcord.
仅限使用拉索系统的降落伞：丢弃主伞开伞拉索。
4. Locate and grasp the cutaway handle.
找到并抓住切伞把手。
5. Locate the reserve ripcord handle.
找到备伞把手。
6. Pull the cutaway handle until no lower than 1,000 feet.
拉动切伞把手，且拉动切伞把手时高度不得低于 1000 英尺。
7. Pull the reserve ripcord handle immediately after cutting away or by at least 1,000 feet, regardless of stability, to initiate reserve deployment.
切伞后立即拉动备伞把手，或至少在 1000 英尺以上拉动备伞把手，无论稳定性如何，都要开备伞。
8. Arch and check over the right shoulder for reserve pilot chute deployment.
做弓形，视线越过右肩检查备伞引导伞的释放情况。
9. Cut away above 1,000 feet.
只能在 1000 英尺以上切伞。

a. If a malfunction procedure has not resolved the problem by then, deploy the reserve (requires a cutaway with

an SOS system).
如果故障处理程序仍未能解决问题，则开备伞（对于单把手紧急系统，开备伞会导致切主伞）。

b. In the event of any malfunction and regardless of the planned procedure or equipment, the reserve ripcord must be pulled by no lower than 1,000 feet.
无论发生任何故障，无论计划的程序或装备怎样，必须在不低于 1000 英尺的高度将备伞把手拉出。

OTHER UNUSUAL SITUATIONS「其他异常情况」

1. Premature container opening in freefall (hand deployment only)：
在自由落体状态下伞包过早打开（仅限手抛式开伞）：
   a. Attempt to locate and deploy the pilot chute first (no more than two attempts or two seconds, whichever comes first).
首先尝试定位和释放引导伞（尝试不超过两次或不超过两秒，以较早者为准）。
   b. If the pilot chute can't be located after two tries or if deploying the pilot chute results in a partial malfunction, cut away and deploy the reserve.
如果两次尝试后无法找到引导伞，或者如果释放引导伞导致部分故障，则切伞并开备伞。
2. Both parachutes deployed:
主伞和备伞都打开的情况：
   a. Biplane「两伞一前一后的情况」
      (1) Do not cut away.
不要切伞。
      (2) Steer the front canopy gently using toggles or leave the brakes stowed and steer by pulling on the rear risers.
通过前伞刹车棒轻轻控制转向，或不释放刹车棒，通过拉动前伞后组提带转向。
      (3) Leave the brakes stowed on the back canopy.
后伞的刹车棒不要释放。
      (4) Make a parachute landing fall on landing.
执行 PLF 着陆。
   b. Side-by-side (two alternatives)「一左一右紧贴的情况（两种处理方案）」
      (1) side-by-side alternative one
方案一
         (i) If the two canopies are not tangled, cut away and fly the reserve to a safe landing.
如果两个降落伞没有缠绕在一起，切掉主伞，用备伞降落到安全的地方。
      (2) side-by-side alternative two
方案二
         (i) Steer the dominant (larger) canopy gently using toggles or leave the brakes stowed and steer by pulling on the rear risers.
使用刹车棒轻轻地操纵占主导地位的伞（面积较大的伞），或者不释放刹车棒，通过拉动其后组提带转向。
         (ii) Leave the brakes stowed on the other canopy.
另一个降落伞的刹车棒不要释放。
         (iii) Make a parachute landing fall on landing.
执行 PLF 着陆。
   c. Downplane: Cut away the main canopy.
主伞和备伞分处两边的情况：切断主伞。
3. Canopy collision:「降落伞相撞」
   a. Jumpers must avoid collisions with other jumpers under open parachutes.
跳伞者必须避免在开伞后与其他跳伞者发生碰撞。

b. If a collision is imminent, in most cases both jumpers should steer to the right.
如果碰撞迫在眉睫，在大多数情况下，两名跳伞者都应该向右转向。

c. If two jumpers collide and entangle, they must communicate their intentions before taking further action.
如果两名跳伞者相撞并纠缠在一起，他们必须在采取进一步行动之前先传达他们的意图。

d. If it is too low for a safe cutaway (below 1,000 feet) and the canopies are uncontrollable, both jumpers should deploy their reserves.
如果高度太低（低于 1000 英尺）以至无法安全切伞，并且降落伞无法控制，则两名跳伞者都应该开备伞。
Note: Deploying the reserve on a single-operation system necessitates a cutaway.
注：对于单把手紧急系统，开备伞会切掉主伞。

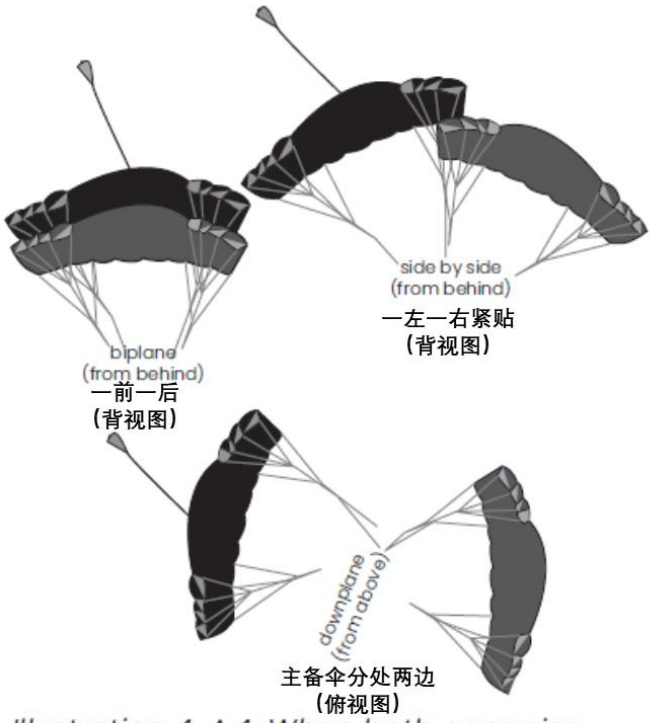

Illustration 4-A.4. When both canopies deploy, they tend to stabilize into one of three configurations, as shown.
图4-A.4 主伞和备伞都被打开时，一般会出现这三种情况

PREMATURE DEPLOYMENT IN AIRCRAFT「在飞机上过早开伞」

1. The student should attempt to contain the open parachute and inform the instructor.
学生应设法控制住被打开的降落伞，并通知教练。
2. If the parachute goes out the door, the student must follow immediately before being extracted.
如果降落伞出了舱门，学生必须在被其拉出舱前紧跟其后。

II. SOLO: METHOD-SPECIFIC SECTION「单人跳伞学习：特定方法部分」

Note: This section must be taught by either a USPA Instructor or Examiner rated for the method-specific discipline in which the student is being trained.
注：本节必须由 USPA 教练或考官教授，该教练或考官应持有学生所接受的特定培训方法对应的教学评级。

A. AIRCRAFT PROCEDURES「飞机程序」

1. Approach, enter, and move about the aircraft, engine running or not, only when accompanied by your instructor.
只有在教练陪同下，学生才能接近飞机、登机并在飞机内移动，无论发动机是否运转。
2. To avoid contact with the propeller, always approach fixed-wing aircraft from the rear.

为避免与螺旋桨接触，必须从后方接近固定翼飞机。

3. Be mindful of the size of the parachute equipment when climbing into and moving about the aircraft.
   爬进飞机或在飞机里移动时，要考虑到降落伞装备的大小。
4. The pilot and the jumper are jointly responsible that seat belts are worn during taxi, takeoff, and landing (see the FARs on seat belt use).
   飞行员和跳伞者共同负责确认在滑行、起飞和着陆时系好安全带（见 FAR 关于安全带使用的说明）。
5. Climbout and exit procedures prepare you to meet the relative wind in a stable, belly-first freefall body position.
   爬出机舱和出舱的程序可以让学生做好准备，以稳定的、腹部迎风的自由落体姿势面对来流。
   a. Into position or climbout: Move into position using practiced steps for efficient placement in the door (larger plane) or on the wing strut (Cessna, etc.).
      舱内就位或爬出机舱：用练习过的步骤，在舱门（大飞机）或机翼支柱（塞斯纳等小飞机）上就位。
   b. Set-up: The pre-launch position should place your belly (pelvis) into the relative wind as part of the launch from the plane.
      准备就位：跳出前的姿势应有助于把腹部（骨盆）置于相对来流中，作为从飞机上跳下的过程的一部分。
6. Count or “go” command
   出舱信号或“Go”口令
   （译者注：这里含有出舱流程使用的英语口令，中国国内的教练可能会根据需要使用不同的口令）
   a. AFF students: Verify that the instructors are ready.
      AFF 学生：先确认教练准备好了。
      (1) Call “Check in!” to the inside instructor, who responds, “OK!”
          然后向舱内教练喊“Check in！”，舱内教练会回答：“OK！”
      (2) Call “Check out!” to the outside instructor, who responds, “OK!”
          接着向舱外教练喊“Check out！”，舱外教练会回答：“OK！”
      (3) Take a breath to relax and then begin a verbal and physical cadence of three (“Up, down, arch!” or “Out, in, arch!” etc.) to help the instructors leave simultaneously with you.
          深呼吸放松，然后开始数三声并且身体有节奏地做出舱信号动作（“Up，Down，Arch！或“Out，In，Arch！”等），这有助于让教练和学生同时出舱。
   b. Static-line or IAD students: Climb into position and wait for the instructor’s command.
      Static Line 或 IAD 学生：爬到指定位置，等待教练的指令。
      (1) Look for corrective signals from your instructor (examples in SIM Appendix A).
          注意教练的纠正手势（见本书附录 A 中的示例）。
      (2) On “Go!” take a breath to relax and look up.
          喊“Go!”同时深呼吸，放松，抬头。
      (3) Release from the plane, count out loud by thousands to five-thousand, then check the parachute.
          跳出飞机，大声数到 1005，然后检查降落伞。
   c. You must exit soon after climbout to ensure that you open the parachute over the correct place on the ground.
      爬出机舱后必须迅速跳下，以确保在正确的地面相对位置打开降落伞。

B. EXIT PRESENTATION「出舱迎风姿势」

1. Upon release from the plane, move efficiently into the flying position to reduce unwanted momentum.
   从飞机上跳下后，应高效地进入飞行姿势，减少不必要的动作。
2. Present the correct belly-to-wind position: hips to the wind, head back, legs extended, and hold.
   做出正确的腹部迎风的姿势：顶胯，抬头，伸腿，保持。
3. Head-high presentation to the relative wind helps you remain oriented; however, you might also exit sideways or head down in relation to the horizon while remaining stable, belly first, on the relative wind.
   进入来流时，头部朝上有助于稳定方向；但也可以侧向出舱或头朝下出舱，同时保持稳定，腹部迎风。

C. EXIT PROBLEMS「出舱问题」

1. Special considerations for AFF exits:
   AFF 学生出舱的特殊注意事项：
   a. In case of instability, (in order)—
      如果不稳定，（按顺序进行下面步骤）—
      (1) arch until the horizon comes flat into view
          做弓形，直到地平线水平地进入视野
      (2) read the altimeter
          检查高度
      (3) establish communication with the instructors (examples of signals in SIM Appendix A)
          与教练沟通（见本书附录 A 中的手势示例）
   b. Continue as usual in the event of the loss of one instructor.
      如果其中一名教练跟丢了，照常继续。
   c. If both instructors become unavailable at any time during the freefall, open the parachute immediately.
      如果在自由落体过程中，两名教练都不能在身边协助，应立即打开降落伞。
2. Special considerations for static-line exits:
   Static-Line 学生出舱的特殊注意事项：
   a. Arch to regain lost stability on exit.
      出舱时做弓形，以恢复稳定。
   b. If the static line fails to disconnect from the parachute system and you are being towed behind the aircraft, (in order)—
      如果 Static Line 未能与降落伞系统断开，学生被飞机拖在后面，（按顺序进行下面步骤）—
      (1) Remain arched and use a predetermined signal to communicate recognition of the problem.
          保持弓形并使用预定手势，示意有问题。
      (2) Wait for the instructor to cut the static line.
          等待教练切断 Static Line。
      (3) After falling free, deploy the reserve.
          开始自由落体后，开备伞。

D. AIRCRAFT EMERGENCIES「飞机紧急情况」

1. In the event of an aircraft emergency:
   在飞机遇到紧急情况时：
   a. Sit still, with helmet on and seat belt fastened
      坐着别动，戴着头盔，系好安全带
   b. Wait for a command from your instructor
      等待教练的指令
2. In the event of a problem during flight, the instructor will help prepare you for one of four actions:
   如果飞机飞行过程中出现问题，教练将帮助学生准备采取以下四个措施之一：
   a. All land with the aircraft.
      所有人随飞机一起降落。
   b. Exit and deploy the reserve parachute.
      出舱并开备伞。
   c. Exit and deploy the main parachute (passive deployment for IAD and static-line).
      出舱并开主伞（IAD 和 Static Line 学生是被动开伞）。
   d. Perform a routine exit with or without instructor assistance.
      在有或没有教练帮助的情况下执行正常出舱程序。
3. Rough landing procedures:
   飞机硬着陆流程：

a. Helmet and seat belt on
戴上头盔和安全带
b. Knees to chest
膝盖抵住胸部
c. Hands clasped behind head to reinforce neck
双手紧握在头后以支撑颈部
d. Immediate but orderly exit from the aircraft on landing
飞机着陆后迅速而有秩序地离开
e. Jumpers exiting a wrecked aircraft should go immediately to the nearest exit, touch nothing on the aircraft, and walk at least 100 feet away from the plane.
离开受损飞机的跳伞者应立即前往最近的出口，不要触碰飞机上的任何东西，并至少离开飞机 100 英尺。

4. After an emergency exit and once under an open canopy:
如果执行紧急出舱，且降落伞正常打开：
a. Look for the instructor's parachute and follow it to a clear, open landing area.
寻找教练的降落伞，然后跟着教练飞到空旷的着陆区域。
b. Select any clear area if an instructor can't be found.
如果找不到教练，则选择任何空旷区域进行降落。

III. AFF PROCEDURES「AFF 流程」

Note: This section must be taught by either a USPA AFF Instructor or Examiner.
注：本节必须由 USPA AFF 教练或考官授课。

A. FREEFALL PROCEDURES「自由落体流程」

1. After exit, take a breath and relax into the correct freefall position.
出舱后，深呼吸，放松，做出正确的自由落体姿势。
2. Perform a "circle-of-awareness" check:
执行"高度意识"检查：
a. Look at the ground about 45 degrees ahead and below.
看看前方和下方约 45 度的地面。
b. Read the altimeter.
读取高度表。
c. Look first to the reserve-side instructor and then to the main-side instructor for an acknowledgment or any communication (corrective signals, see SIM Appendix A).
先看副教练，然后看主教练，看教练是否给出认可，或给出任何其他信号（纠正手势见本书附录 A）。
3. Perform three practice deployments.
执行三次模拟开伞练习。
a. Practice slowly and deliberately.
要有条不紊地进行练习。
b. Verbalize each action, e.g., "Arch, reach, touch!"
喊出每一个动作，例如"Arch，Reach，Touch！"
c. Pause to feel the deployment handle each time.
每次都要稍作停顿以感受开伞把手。
d. Reinforce the correct body position before, during, and after each practice deployment.
每次模拟开伞练习前、练习时、练习后，都要保持正确的身体姿势。
4. Perform a second circle-of-awareness check.
进行第二轮"高度意识"检查。
5. Monitor altitude and body position for the remainder of the freefall.

在剩余的自由落体过程中关注高度和身体姿势。

a. altitude (most important)
高度（最重要）
b. arch (hips forward)
弓形（顶胯）
c. legs (check leg position and probably extend them slightly)
控腿（检查腿的姿势，可能要稍微伸腿）
d. relax (breathe)
放松（呼吸）

6. Video camera flyer「有摄影时」
   a. You must pay attention to the altitude, not the camera flyer.
   必须注意高度，而不是摄影机。
   b. The benefit of video is recognized for all training jumps.
   记录视频对跳伞训练很有用，这是公认的。
7. At 5,500 feet, initiate deployment procedures:
   在 5500 英尺处，启动开伞程序：
   a. Signal deployment to instructors by waving both arms overhead.
   在头顶挥舞双臂向教练示意开伞。
   b. Deploy the parachute as practiced.
   和练习时一样，打开降落伞。
   c. The instructor may assist with activation and deployment.
   教练可能会协助开伞。

B. AFTER DEPLOYMENT「开伞后」

1. Look for traffic (other canopies).
   注意交通（找其他降落伞）。
2. Follow "normal canopy flight procedure" practiced in first jump course.
   遵循在第一跳课程中练习的"正常的降落伞飞行程序"。
3. If unable to locate primary landing area, follow the instructors to a safe landing area or steer to the nearest clear area for landing.
   如果无法找到主着陆区，则跟随教练到安全着陆区，或转向最近的空旷区着陆。

IV. TANDEM PROCEDURES「双人伞流程」

Note: This section must be taught by either a USPA Tandem Instructor or Examiner. FAA-approved tandem parachutists in command may jump with passenger parachutists but are not USPA-rated skydiving instructors.
注：本节必须由 USPA 双人伞教练或考官进行授课。非 USPA 教练评级的联邦航空局认证的双人伞指挥员也可以和双人伞乘员一起跳伞。

A. TANDEM TRAINING STRATEGIES「双人伞培训策略」

1. Not all schools train students to complete Category A on the first tandem jump, and not all students desire it.
   并不是所有跳伞学校都训练学生在第一次双人跳伞中完成 A 单元的学习，而且也不是所有的学生都希望这样。
2. Much of the instruction on the Tandem first jump may take place during the jump itself.
   双人伞第一跳的大部分教学内容可能是在跳伞过程中教授。

B. MINIMUM TANDEM COURSE「最简版双人伞课程」

1. Before boarding the aircraft, you should be briefed on how to do the following:
   登机前，教练应向学生简要介绍以下操作：

a. check the four points of attachment to the instructor's harness
检查与教练背带的四个连接点
b. place both hands in the safety position
双手放在安全位置
c. establish an arch on exit
在出舱时保持弓形
d. maintain a stable freefall position
保持稳定的自由落体姿势
e. read the altimeter
检查高度
f. operate the drogue release handle by 5,000 feet
在 5000 英尺以上操作减速伞释放把手
g. prepare for landing
准备着陆

2. Refer to FAR 105.45.a.2.i in Section 9 of the SIM.
参见本书第 9 章的 FAR 105.45.a.2.i。

C. CATEGORY A VIA TANDEM JUMPING「通过双人伞学习 A 单元」

1. Category A freefall position, main deployment, canopy skills, training and advancement criteria are the same as for solo students.
A 单元自由落体姿势、主伞开伞、伞控技能、训练和晋级标准与单人跳伞学生相同。
2. PLF landing training, solo equipment orientation, equipment malfunction training, and all method-specific training are to be completed during Category B.
PLF 着陆训练、单人跳伞装备培训、装备故障训练和所有特定培训方法的训练将在 B 单元期间完成。
3. Since the minimum drogue release altitude for tandem jumps is 5,000 feet (BSRs), Tandem students should begin deployment procedures by at least 6,000 feet.
由于双人伞的最低开伞高度为 4500 英尺（基本安全要求规定），双人伞跳伞学生应该至少在 6000 英尺以上开始开伞程序。
4. Most of the Category A training can be conducted as the jump progresses.
大部分 A 单元训练都可以随着跳伞的进行而进行。
5. Special training notes:
特别培训说明：
a. freefall position: On at least the first Tandem jump, your hands should remain in the safety position on the front of the harness at all times, unless otherwise directed by the tandem instructor.
自由落体姿势：至少在第一次双人伞跳伞时，除非双人伞教练另有指示，否则学生的手应始终保持在安全位置（安全带前部）。
b. deployment: in terms of a solo rig.
开伞：视不同类型的单人跳伞装备而言。
c. climbout and exit:
爬出舱门和出舱：
(1) The instructor will teach you the exit that best presents you face-first into to the relative wind.
教练会教学生最佳的脸迎风出舱姿势。
(2) The instructor verifies that you are ready, and then begins a cadence of three ("Ready, set, go!" "Up, down arch!" etc.) to help you anticipate the exit.
教练确认学生准备好后，开始有节奏地做三步出舱信号动作（"Ready、Set、Go"、"Up、Down、Arch"等），以帮助学生对出舱做好准备和预期。
d. equipment:「装备」

(1) In Category A, the Tandem instructor takes responsibility for correctly putting on and adjusting your equipment and protecting the operation handles during pre-jump operations.
在 A 单元中，双人伞教练负责正确地帮学生穿上和调整装备，并在跳前保护操作把手。

(2) Before moving into exit position at the jump door, you must verify the harness attachment in two places at the shoulders and two places near the hips.
在移动到出舱位置之前，学生必须确认肩部的两个背带连接点和臀部附近的两个背带连接点都正常连接。

e. freefall procedures「自由落体流程」

(1) After exit, take a breath and relax into the correct freefall position.
出舱后，深呼吸，放松，做出正确的自由落体姿势。

(2) Look for signals from the instructor (SIM Appendix A) or listen for verbal corrections.
寻求教练的手势信号（见本书附录 A）或注意听口头纠正指令。

(3) If you exited with both hands in the safety position, the instructor may signal to move them into the freefall position.
如果出舱时，学生双手处于安全位置，教练可能会适时发出手势，让双手转换到自由落体姿势。

(4) Once in freefall, perform according to the Category A dive flow for tandem students.
进入自由落体状态后，学生应根据 A 单元双人伞自由落体跳伞流程练习。

f. Canopy flight procedures are the same as the canopy dive flow for solo students.
降落伞飞行程序与单人跳伞学生的开伞后流程相同。

g. landing「着陆」

(1) You'll prepare for routine landings with a technique specific to tandem jumping for that day's conditions.
根据跳伞当天的条件，学生将使用特定的双人伞着陆技巧来为正常着陆做准备。

(2) A severe situation requires a parachute landing fall (PLF), which the instructor can teach on the ground or while under canopy in the event of a problem.
严重情况下需要 PLF，教练可以在地面或在开伞后教 PLF，用以应对可能出现的问题。

(3) Ordinarily, you'll learn the PLF during transition training to solo freefall (first-jump course).
通常学生会在向单人跳伞自由落体的过渡期间学习 PLF（第一跳课程）。

h. The instructor may need to provide additional training to prepare you for landing a tandem parachute in higher winds.
教练可能需要提供额外的训练，为在大风中使用双人伞降落做准备。

dive flows「跳伞流程」

CATEGORY A FREEFALL DIVE FLOWS「A 单元自由落体流程」

AFF「AFF」

- Exit in a relaxed arch「在放松的弓形姿态中出舱」
- Instructors release arm grips「教练松手」
- Circle of Awareness「高度意识（看高度）」
- Three practice deployments「三次模拟开伞练习」
- Circle of Awareness「高度意识（看高度）」
- Altitude, arch, legs, relax「高度、弓形、控腿、放松」
- Begin wave off at 5500 feet「在 5500 英尺高度开始挥手示意」
- Pull by 4,500 feet「在 4500 英尺开伞」

IAD AND STATIC LINE「IAD 和 Static Line」

- Check deployment device prior to climb-out「爬出机舱前检查开伞装置」
- Climb out「爬出机舱」
- Exit on command with legs extended「听指令出舱，双腿伸展」
- Count aloud to five by thousands「大声数到 1005」
- Check canopy「检查降落伞」

TANDEM : CATEGORY A TRAINING「双人伞：A 单元训练」

- Exit with arms in safety position「出舱时，手在安全位置」
- On instructor's signal, relax into neutral arch「根据教练的手势，放松，采取中性的弓形姿势」
- Check altitude「检查高度」
- Three practice deployments「三次模拟开伞练习」
- Altitude, arch, legs, relax「高度、弓形、控腿、放松」
- Begin wave off by 6,000 feet「在 6000 英尺处开始挥手示意」
- Pull by 5500 feet「在 5500 英尺开伞」

CATEGORY A CANOPY DIVE FLOW「A 单元开伞后流程」

- (also used for tandem students training to meet Category A objectives)
  「双人伞训练时也要做，以达到 A 单元目标」
- Release brakes and fix routine opening problems「释放刹车棒，解决常规的开伞故障」
- Look left, turn left「向左看，再向左转」
- Look right, turn right「向右看，再向右转」
- Flare「练习刹车拉平」
- Check altitude, position, and traffic「检查高度、位置、交通」
- Locate holding area, pattern "checkpoints," and target「找到等待区、着陆航线参考点、着陆目标」
- Remain in holding area until 1,000 feet「在等待区盘旋直到 1000 英尺高度」
- Follow preassigned pattern over landing area 「按照预先计划的航线着陆」
- Flare to land and PLF (solo students) 「刹车拉平着陆，并 PLF（对于单人跳伞学生）」

CATEGORY A INSTRUCTOR NOTES「A 单元教练注意事项」

- Budget training time to cover only the most important topics.
  规划好培训时间，把时间用在最重要的内容上。
- To reduce student workload and training effort, employ staff support as much as possible, including assistance after landing.

为了减少学生负担和训练量，应尽可能让其他工作人员提供支持，包括着陆后的协助。

- The instructor is responsible for putting the student's equipment on, adjusting it, and performing all equipment checks; students make sure checks are performed.

教练负责给学生穿上装备、调整学生的装备，并执行所有装备检查；学生应确保教练进行了这些检查。

- The instructor closely supervises the student when approaching, boarding, and being seated in the aircraft, including providing instruction on seat belt use during seating.

当学生接近飞机、登机和就座时，教练应密切关注监督学生，包括在就座时提供安全带的使用指导。

- The instructor directs the student on the correct action in the event of any aircraft emergency (except in the event of the student's parachute deploying out the door).

在任何飞机紧急情况下（学生降落伞在舱门外打开的情况除外），教练应指导学生采取正确的行动。

category a quiz「A 单元小测」

ADMINISTERED PRIOR TO CONDUCTING JUMPS IN THE NEXT CATEGORY「测试应在进入下一单元跳伞前进行」

Quiz answers are listed in Appendix B.「测验答案列在附录 B 中」

1. Describe how to avoid the propeller(s) when approaching an aircraft.
   在接近飞机时如何避开螺旋桨?
2. Who is responsible for seat belt use in the aircraft?
   在飞机上谁负责安全带的使用？
3. When must seat belts be fastened?
   什么时候必须系安全带？
4. From whom do you take directions in the event of an aircraft problem?
   如果飞机出了问题，你应向谁寻求指示？
5. Why is it important to exit on “Go!” (or “Arch!”)?
   为什么出舱时喊“出”（或“弓形”）很重要?
6. Where does the wind come from initially upon exit from the aircraft?
   刚出舱时，风从哪里来?
7. Why do skydivers first learn to fall stable face to earth (think in terms of the equipment)?
   为什么跳伞者首先要学会面朝对地面稳定下落（从装备的角度考虑）？
8. What changes during a turn that makes low turns so dangerous?
   转弯过程中会发生什么变化，使得低转非常危险？
9. What are the landing priorities?
   着陆的优先事项是什么？
10. What is the purpose of the landing flare?
    着陆时进行拉平的目的是什么？
11. Describe the procedure for a hard landing (parachute landing fall or PLF).
    描述 PLF 的流程。

Mental Relaxation: The Key to Body Flight「精神放松：身体飞行的关键」

In the early categories, like a magic mantra, you'll hear over and over again from your instructors: "Altitude, arch, legs, relax." Managing all four points at once is the key to controlled freefall.
在前几个单元的学习中，学生会一遍又一遍地从教练那里听到："高度、弓形、控腿、放松"，像魔咒一样。同时做好这四点是控制好自由落体的关键。

After altitude awareness, relaxing is your key goal. It takes only a little push from the hips to get an effective arch, and you usually need to extend your legs only a little to get use of them in the wind. But you need to relax your other muscles a lot.
除了必须保持高度意识以外，放松是你的重要目标。胯部只需要稍微一顶就能有效地作出弓形，两腿通常只需要稍微伸展就能在风中控制好。但是同时，你还需要放松你的其他肌肉。

So how can a brand-new skydiver relax in such an adrenaline-charged, exciting, and new environment?
那么，新手跳伞者如何能在这样一个充满肾上腺素、令人兴奋和全新的环境中放松呢？

Sports psychologists all recognize the value of staying loose and mentally relaxed for peak performance. Many describe ways to achieve a state of prepared relaxation. Each athlete learns to develop one technique and uses it to gain that state before and maintain it during every performance.
运动心理学家都认识到身体和精神的放松对于达到最佳状态的重要性。许多人也分享了他们进入放松状态的方法。很多运动员都学会使用一些技巧，以在每次比赛前获得这种状态，并在比赛中保持这种状态。

Almost all the techniques begin with slower, deeper, controlled breathing. Learn to breathe from deep in your lungs, using the muscles of your diaphragm. Practice breathing in slowly until your lungs are full and then emptying your lungs completely when you breathe out.
几乎所有的技巧都是从缓慢的、更深的、受控的呼吸开始的。学会从肺部深处呼吸，使用你的横膈膜肌肉。慢慢地练习吸气，直到你的肺充满空气，然后在你呼气时完全排空你的肺。

While you practice controlled breathing, you can use one of several suggested devices to relax your mind and your body:
当你练习控制呼吸时，可以使用以下几种暗示中的一种来放松大脑和身体：

- Imagine yourself in a familiar, comfortable place, trying to visualize every sensual experience that you can associate with it: sight, sound, odor, taste, and touch. Picture the colors of the background and the details, try to smell the air as it would be, imagine you hear the sounds, and feel the air on your face. Imagine you just took a sip of your favorite drink.
  想象你自己在一个熟悉、舒适的地方，试着想象你能联想到的每一种感官体验：视觉、声音、气味、味觉和触觉。想象一下背景的颜色和细节，试着闻到空气的味道，想象一下你听到的声音，感觉到空气吹拂过脸颊。想象一下你抿了一口你最喜欢的饮料。

- Relax your body part by part, starting with your toes, then your ankles, calves, thighs, hips, abdomen, etc., spending five to ten seconds in each place while continuing your controlled breathing.
  身体各部分依次放松，先从脚趾开始，然后是脚踝、小腿、大腿、臀部、腹部等，在每个地方停留 5 到 10 秒，同时继续进行有控制的呼吸。

- Count up to ten with each breath and then backward to zero.
  每次呼吸时数到十，然后倒数到零。

There are many other relaxation techniques you can borrow or develop, but choose one and practice it until you perfect it, even when you're not skydiving. That way, you can relax yourself quickly and effectively whenever the need arises—such as just before a skydive.
有许多其他的放松技巧可供你使用或者开发。选择其中一个，不断练习，直到熟练，即使是在不跳伞的时候。这样，你可以在需要的时候快速有效地放松自己，比如在跳伞之前。

You should continue controlling your breathing as you're getting ready to jump. Move slowly and deliberately in the aircraft as you approach the door and get into position, not only for safety but to help you maintain your relaxed, prepared state for the jump. Take another breath just before you actually launch from the aircraft and again to help you settle into freefall as soon as you let go. Make breathing part of every sequence, especially as you go through your "altitude, arch, legs, relax" sequence.
当你准备进行跳伞的时候，你应该继续控制呼吸。当你靠近舱门并就位时，在飞机上缓慢而有意地移动，这不仅是为了安全，还有助于保持在放松、有准备的跳伞状态。在你即将从飞机上跳下之前，再做一次呼吸，跳出之后，又再做一次呼吸，以帮助你适应自由落体状态。让控制呼吸成为每个动作的一部分，特别是当你在做"高度、弓形、控腿、放松"动作时。

While skydiving is inherently a high-speed sport, you'll notice that the best skydivers never do anything in a hurry.
虽然跳伞运动本质上是一项高速运动，但你会发现，最优秀的跳伞者从不急于求成。

"There are many other relaxation techniques you can borrow or develop, but choose one and practice it until you perfect it, even when you're not skydiving."
"有许多其他的放松技巧可供你使用或者开发。选择其中一个，不断练习，直到熟练，即使是在不跳伞的时候。"

4-B B 单元Category B

INTRODUCTION「序言」

In Category B, you learn to become more comfortable in the skydiving environment.
在 B 单元中，学生会更加地熟悉跳伞环境。

- AFF and tandem students perform leg awareness exercises to improve control and also may perform assisted turns(if trained) in preparation for heading maintenance in Category C and controlled turns in Category D.

  AFF 和双人伞学生进行腿部意识练习以提高控制力，另外也可以进行辅助转向练习（如果培训过相关内容），为 C 单元的朝向保持和 D 单元的受控转向做好准备。

- Static-line and IAD students get introduced to the self-deployment device and practice mock deployments after exit.

  Static Line 和 IAD 学生开始学习自行手动开伞，并在出舱后练习模拟开伞。

- Tandem students take a more active role in the exit, leading the count and presenting their bodies correctly to the wind. Each tandem student should hold a correct body position until establishing stability and then maintain it throughout the freefall.

  双人伞学生在出舱时发挥更主动的作用，主导出舱信号，并让身体正确地迎风。每个双人伞学生都应该保持正确的身体姿势，直到稳定下来，然后在整个自由落体过程中保持稳定。

Training in this category reviews and expands your understanding of the canopy landing pattern and the airport environment, with attention to avoiding aircraft on or approaching the runways. You help with pre-flight planning and the use of the written flight plan, including opening point, the projected wind line, and the landing pattern. Also, you learn to use the runway as a reference for direction and distance when observing the drop zone from the aircraft or under canopy.
这一单元的培训中，学生将复习并加深对降落伞着陆航线和机场环境的理解，并学会注意避开跑道上的飞机和正在接近跑道的飞机。学生可以在跳伞前协助制定飞行计划和使用书面飞行计划，包括开伞点、预计的风线和着陆航线。此外，当学生在飞机上或开伞后观察跳伞基地时，也要学会用跑道作为方向和距离的参考。

For AFF, IAD, and static-line students, emergency review emphasizes topics from the first-jump course on parachute malfunctions. Tandem students will also learn and practice parachute malfunction procedures before advancing from this category to solo freefall.
对于 AFF、IAD 和 Static Line 学生，紧急情况的回顾复习将强调第一跳课程学过的降落伞故障主题。双人伞学生在进入单人跳伞自由落体培训之前也将学习和练习降落伞故障程序。

In Category B, you become more responsible for your equipment, particularly while moving around and inside the aircraft. Study topics introduce USPA Basic Safety Requirements for student jumps.
在 B 单元中，学生开始对自己的装备承担更大的责任，尤其是在飞机周围和飞机内移动时。在本单元的学习主题中，学生可以了解到 USPA 基本安全要求（BSR）中有关学生跳伞的部分。

To advance, AFF and tandem students should monitor altitude and deploy at the correct altitude without prompting from the instructor. IAD and static-line students must complete three successive, stable practice deployments.
为了晋级至后续单元，AFF 和双人伞学生应在没有教练提示的情况下关注高度并在正确的高度开伞。IAD 和 Static Line 学生必须能够完成三个连续、稳定的模拟开伞。

Instructor: Transition Protocol 教练：转换规则

Crossover students to harness hold who have completed Category A in the tandem program must complete the harness-hold first-jump course before making AFF jumps in Category B.
在双人伞培训中完成 A 单元学习的、转换至 Harness-hold 程序的学生必须在进行 B 单元 AFF 跳伞之前完成 Harness-hold 程序第一跳课程。

Crossover students to AFF who have completed Category A in the IAD or static-line program will need additional training on the climbout, set-up, and count; AFF freefall communications; use of the altimeter in freefall; and use of the main parachute deployment device, including deployment device malfunctions and premature container opening.
在 IAD 或 Static Line 培训方法中完成 A 单元学习的、转换至 AFF 培训方法的学生需要额外培训以下内容：爬出机舱、准备就位和出舱信号；AFF 自由落体时与教练的沟通；自由落体时高度表的使用；主伞开伞装置的使用，包括开伞装置故障和计划外提前开伞。

Crossover students to tandem who have completed Category A in the solo jumping programs will need to complete any additional required paperwork and understand their responsibility to check the tandem system hook-ups before exit, as well as any special landing procedures.
在单人跳伞培训方法中完成 A 单元学习的、转换至双人伞培训方法的学生需要完成一些额外的文书工作，并知悉自己在出舱前检查双人伞系统背带连接点的责任，以及双人伞的特殊着陆流程。

Crossover students to IAD or static line who have completed Category A in another solo training method will need training in their main deployment system and its specific emergency procedures.
在另一种单人跳伞培训方法中完成 A 单元学习的、转换至 IAD 或 Static Line 培训方法的学生需要在主伞开伞系统及其特定紧急程序方面进行培训。

Category A students crossing over to IAD or static line from the tandem program will need to complete the solo first-jump course before making IAD or static-line jumps in Category B.
A 单元学生从双人伞培训方法转换至 IAD 或 Static Line 培训方法时，在进行 B 单元的 IAD 或 Static Line 跳伞之前，需要完成单人跳伞第一跳课程。

AFF「AFF」

- one jump 1 跳

IAD/STATIC-LINE「IAD 或 Static Line」

- three jumps 3 跳

TANDEM「双人伞」

- two jumps 2 跳

RECOMMENDED MINIMUM DEPLOYMENT「建议最低开伞高度」

- AFF: 4,500 feet
  AFF：4500 英尺
- IAD and static line: 3,500 feet
  IAD 和 Static Line：3500 英尺
- Tandem: 5,500 feet
  双人伞：5500 英尺

Category at a Glance「单元概览」

ADVANCEMENT CRITERIA「晋级标准」

EXIT AND FREE-FALL「出舱和自由落体」

AFF AND TANDEM STUDENTS「AFF 和双人伞学生」

- stability within ten seconds of exiting the aircraft
  出舱后 10 秒内，姿态稳定下来
- maintain correct body position for stability throughout, including leg awareness and control
  始终保持正确的身体姿势以保持稳定性，包括腿部意识和控制
- assisted deployment within 500 feet of the assigned altitude
  在指定高度 500 英尺内，在教练提示下开伞（教练可协助）
- in addition, tandem students complete the solo first-jump course
  此外，双人伞学生需要完成单人跳伞第一跳课程

IAD AND STATIC-LINE STUDENTS「IAD 和 Static Line 学生」

- three successive exits with stable practice deployments within five seconds of exit
  学生需要连续三次在出舱后 5 秒内的稳定地模拟开伞

CANOPY「伞控」

- understanding and planning descent strategy from opening to pattern entry and pattern principles
  理解和规划伞降策略（从开伞到着陆航线起始点）以及着陆航线的原则
- steering including clearing airspace (looking before turning) without prompting (self-evaluated)
  在没有提示的情况下，在确认空域畅通时进行转弯（转弯前先看向要转弯的方向）（自行判断）
- assisted flare for a safe landing within 30 degrees of heading into the wind
  在协助下刹车拉平以安全着陆，着陆方向应逆风且在风向的 30 度范围内

EQUIPMENT「装备」

- understanding routine canopy problems and the correct responses
  了解常见降落伞问题及正确应对措施

ORAL QUIZ「口试」

**Note: For reasons of safety, AFF, static line, or IAD students who do not complete the flaring and landing advancement criteria in Category B should be recommended for tandem or other comprehensive canopy training. If all other Category B advancement criteria have been met, the student may satisfy Category B canopy skills in another discipline and then advance to Category C in the preferred discipline.*

**注：出于安全原因，建议在 B 单元中未达到拉平着陆晋级标准的 AFF、Static Line 或 IAD 学生进行双人伞或其他综合性跳伞培训。如果学生达到了所有其他 B 单元晋级标准，学生可能也满足了其他培训方法的 B 单元伞控技能，可以晋级至 C 单元并选择喜欢的培训方法。*

Book Stuff 参考资料

- read and discuss SIM Section 2-1.G for student training, jumps and supervision requirements
  阅读并讨论 SIM 2-1.G 关于学生培训、跳伞和监督要求的内容
- read and discuss the USPA recommendations on parachute malfunctions and procedures, SIM Section 5-1.A-E
  阅读并讨论 SIM 5-1.A 至 E 中 USPA 关于降落伞故障和处理流程的建议
- study the illustration in FAA Advisory Circular 90-66, Appendix 3, in SIM Section 9-2
  学习 SIM 9-2 附录 3 中的联邦航空局咨询通告 90-66 的图表

CATEGORY B: LEARNING AND PERFORMANCE OBJECTIVES 「学习和能力表现目标」

- relaxing in the skydiving environment「在跳伞环境中放松」
- heading awareness「朝向意识」
- parachute deployment「开伞」
- more on the landing pattern「深入了解着陆航线」
- written flight plan「书面飞行计划」
- airport orientation「了解机场」
- protecting handles「保护把手」
- equipment emergency review 「装备紧急情况回顾」

A. EXIT AND FREEFALL「出舱和自由落体」

1. Student-led exit(all students)「学生主导出舱（所有学生）」
   a. Review the exit set-up from Category A.
      复习 A 单元关于出舱时的“准备就位”。
   b. IAD and static-line students perform the climbout with little or no assistance from the instructor and exit promptly on the “Go!” command.
      IAD 和 Static Line 学生要在很少或没有教练帮助的情况下爬出机舱，并在收到“Go”的指令时迅速出舱。
   c. Tandem students climb into position after the instructor’s OK, check with the instructor once in position, and initiate the exit count.
      在教练给出 OK 信号后，双人伞学生爬到指定位置，然后与教练再次确认，并启动出舱信号。
2. Altitude awareness to recognize and act at the assigned pull altitude is the most important task in freefall.
   保持高度意识，能够准确识别指定的开伞高度并开伞，是自由落体中最重要的任务。
3. “Altitude, arch, legs, relax:” Repeat to establish and maintain awareness, stability, and control.
   “高度、弓形、控腿、放松”，重复提醒自己以建立和保持相关意识、稳定性和控制力。
   a. Know your altitude (static line students know their exit altitude and count to keep track of time after release from the aircraft).
      知道高度（Static Line 学生需要知道出舱时的高度并计数以跟踪离机后的时间）。
   b. Check your arch (hips forward a little).
      检查弓形姿态（稍微顶胯）。
   c. Check your legs (most beginners need to extend their legs a little and point their toes).
      检查腿部的姿势（大多数初学者需要把腿伸展开一些并绷直脚尖）。
   d. Relax「放松」
      (1) Breathe consciously to release tension.
          有意识地呼吸以放松。
      (2) Use this technique just before and after releasing from the aircraft.
          在出舱前和出舱后使用这个技巧。
4. Deployment「开伞」
   a. AFF and tandem students
      AFF 和双人伞学生
      (1) Practice deployment in freefall until smooth and comfortable with locating the deployment handle.
          在自由落体过程中练习模拟开伞，直到能够平稳舒服地找到把手的位置。
      (2) Wave-off to signal deployment.
          挥手示意即将开伞。
      (3) Pull at the correct altitude without prompting from the instructor.
          在没有教练提示的情况下在正确的高度开伞。
   b. IAD and static-line students practice deployment within five seconds of exit (three successful jumps in a row required before solo freefall).

IAD 和 Static Line 学生在出舱后 5 秒内练习开伞（在进行单人自由落体之前需要连续三次成功做到这一点）。

5. Leg awareness「腿部意识」
   a. AFF and tandem students practice leg awareness by extending legs while arms remain in a neutral position.
      AFF 和双人伞学生在手臂保持中性位置的同时，通过双腿伸展开来练习腿部意识。
      (1) Extending the legs from the neutral position adds more drag in the back, lifting your lower body.
          从中性位置开始伸展双腿，会增加背部的阻力，把下半身抬起来。
      (2) The off-level attitude causes you to slide forward on the deflected air (less noticeable in tandem droguefall).
          非水平姿态会使学生在被偏转的气流中向前滑行（在双人伞带减速伞下降时不那么明显）。
      (3) Hold the position for three seconds and return to neutral to cancel the effect.
          保持姿势 3 秒钟，然后恢复中性姿势以退出以上效果。
      (4) Finish all maneuvers 1,000 feet above wave-off altitude or 6,000 feet, whichever comes first.
          在挥手示意的高度的 1000 英尺以上或在 6000 英尺以上完成所有机动，以先达到的高度为准。
   b. IAD and static-line students increase leg awareness during the exit set-up and after release from the plane.
      IAD 和 Static Line 学生在出舱准备就位期间和出舱后都要提高腿部意识。
6. Maintaining a heading「保持朝向」
   a. First, relax into a comfortable, relaxed, neutral body position.
      首先，采取一个舒适，放松，中性的身体姿势。
   b. Find a point ahead on the horizon as a heading reference.
      在地平线上找一个参考点作为方向参考。
   c. If turns are trained and performed (AFF and tandem):
      如果学生受到过转向培训且要进行转向练习（AFF 和双人伞）：
      Note: Although not required, team turns—like relaxation—may aid a student in preventing turns on later jumps.
      注：虽然不是必须的，教练辅助转弯—就像学会放松一样—可以帮助学生在后来的跳伞中避免不受控转弯。
      (1) The student turns 90-degrees in one direction.
          学生向一个方向转 90 度。
      (2) The student turns back to the original heading.
          再转回到原来的朝向。
      (3) Check the altitude.
          检查高度。
      (4) Repeat in the opposite direction if time permits.
          如果时间允许的话，向相反的方向重复以上动作。
      (5) If the student does not initiate the turn, the instructor(s) may turn the student.
          如果学生没能启动转弯，教练可帮助学生转弯。

B. CANOPY「伞控」

1. Clearing airspace: both before and during any turn, look in the direction of the turn.
   确认空域畅通：转弯之前和转弯过程中要看向转弯的方向。
2. Using a DZ photo or taking a walk in the field, you'll preview with an instructor the expected opening point and prepare a written flight plan together.
   通过使用跳伞基地照片或逛场地的方式，学生与教练一起预览预计开伞点，并准备书面飞行计划。
3. Review the descent strategy:「复习降落策略」
   a. Determine position and altitude upon opening.
      开伞时确定位置和高度。
   b. Locate the target and establish a line to the pre-planned 1,000-foot pattern entry point.
      找到着陆目标点，并确定一条延伸至 1000 英尺着陆航线起始点的直线。

c. Divide the line logically according to the remaining altitude (halfway down, halfway back); for example, if open at 4,000 feet—
根据剩余高度合理划分这条直线（掉一半高度，走一半路程）；例如，如果在 4000 英尺高度开伞：
(1) Divide the line in half and remain over the first half of the line until 2,000 feet.
将直线划成两段，在直线的前半段内飞行，直到 2000 英尺。
(2) Fly over the remaining half of the line until reaching the pre- planned pattern entry point at 1,000 feet.
在剩余的半段直线上飞行，直至到达预先计划的 1000 英尺着陆航线起始点。

4. Fly to the instructor-assigned pattern entry at 1,000 feet, as identified on the written flight plan.
按照书面飞行计划，飞至教练指定的 1000 英尺着陆航线起始点。
5. Fly the pre-planned pattern using downwind, base, and final approach legs, with specific points to overfly at specified altitudes.
沿着第一边（下风边）、第二边（基线边）、第三边（最后进近）飞预先计划的着陆航线，并且注意在指定高度飞过特定参考点。
6. Fly a straight-in final approach without S-turns(S-turns present a hazard to other traffic).
在最后进近时保持直行，不要做 S 形转向（S 形转向会危及他人的安全）。
7. Flare at ten feet, based on Category A experience.
根据 A 单元的经验，在 10 英尺处拉平。
Note: Flaring is covered in more detail in Categories C and F.
注：可以在 C 单元和 F 单元中详细了解拉平。
8. Review the PLF and its value to protect against a hard landing.
复习 PLF 和其在缓冲硬着陆冲击力上的重要作用。

C. EMERGENCY PROCEDURE REVIEW「紧急程序回顾」

Note: After completing the solo first-jump course, tandem students should review this section each day before making any jump in Category C. This section also serves as a review outline for any jumper undergoing general review following a period of inactivity.
注：完成单人跳伞第一跳课程后，双人伞学生在进行 C 单元的任何一跳之前应每天复习本节内容。本节还可作为一段时间内没跳伞的、想进行一般性复习的跳伞者的复习大纲。

1. Deploy at the correct altitude, regardless of stability.
在正确的高度开伞，不管稳定性如何。
2. Review common problems at the training harness(tandem students may review while under canopy):
使用训练背带复习常见问题的处理（双人伞学生可以在开伞后复习）：
a. correct response to line twist「对线缠绕的正确处理」:
(1) Spread the risers and kick to untwist, but release the brakes only after clearing the twist.
拉开组提带并踢腿以解开缠绕，但刹车棒只能在线缠绕解除后释放。
(2) If spinning, twist the risers to untwist the lines and stabilize canopy, then kick to untwist the risers.
如果降落伞在螺旋下降，则扭动组提带以解开伞绳的缠绕并让降落伞变得稳定，然后踢腿以解开组提带的缠绕。
(3) By 2,500 feet, be sure line twist can be corrected at a safe altitude, or initiate emergency procedures.
在下降到 2500 英尺之前，必须确认能否在安全的高度内解决线缠绕，否则需要启动紧急程序。
b. slider up:「滑块布挂在上面」:
(1) Bring both toggles to the bottom of the stroke to slow the canopy and pump at the bottom of the control range.
把两个刹车棒拉到底，以减缓降落伞的速度，并在刹车的后部分行程反复拉动。
(2) Alternatively, pump the back risers.
另外一种处理方案是反复拉动后组提带。
(3) The slider needs to be at least halfway down for landing.

为了能着陆，滑块布需要至少降到一半高度。

(4) Repeat remedial procedures twice or until reaching the decide-and-act altitude of 2,500 feet.
重复补救程序两次，或在下落至 2500 英尺的切伞决断高度之前进行补救

c. end-cell closure:「末端气室不完全充气」:

(1) Pull both toggles to the bottom of the stroke and hold them until the end cells open, then release them smoothly.
把两个刹车棒拉到底并保持，直到末端气室充气，然后平稳地释放两个刹车棒。

(2) Alternatively, hold down both back risers.
另外一种处理方案是拉下两个后组提带。

(3) If the end cells can't be cleared, evaluate controllability and flare before reaching the decide-and-act altitude of 2,500 feet.
如果不能解决末端气室的问题，在达到 2500 英尺的决断和实施高度之前，需要判断降落伞可控性并测试拉平。

d. If the canopy has opened normally but turns on its own, be sure both brakes are released.
如果降落伞正常打开但自行转弯，应确保两个刹车棒都已释放。

e. Evaluate controllability and flare before reaching the decide-and-act altitude of 2,500 feet for:
在落到 2500 英尺的切伞决断高度之前，如果发现以下问题，应判断降落伞可控性并测试拉平：

(1) Broken steering line: Use back risers.
刹车线断裂：使用后组提带。

(2) Broken suspension line(s)
伞绳悬挂线断裂

(3) Pilot chute entangles with canopy or lines.
引导伞缠绕降落伞或伞绳

(4) Damage: Canopy rips or tears.
损坏：降落伞撕裂。

3. Review deployment problems for manual activation (introduction for IAD and static-line students).
复习手动开伞的问题（对于 IAD 和 Static Line 学生是入门介绍）。

a. Make only two attempts to correct the problem before initiating reserve procedures.
在启动备伞程序之前，只能尝试两次纠正问题。

b. lost deployment handle:
找不到开伞把手：

(1) Hip or chest handle location: Follow harness webbing for two seconds only.
对于开伞把手在髋部或胸部的位置的情况：最多花两秒沿着背带的带子的方向找

(2) Bottom of container location: Sweep bottom of container, then side of container to corner for two seconds only.
对于开伞把手在伞包底部的情况：先在伞包底部寻找，然后再沿着伞包侧面摸到拐角处，只能花不超两秒的时间来找

c. hard pull:
开伞把手拉不出来：

(1) Hip or chest handle location: Try again with two hands.
对于开伞把手在髋部或胸部的位置的情况：用两只手再试一次。

(2) Bottom of container: Place elbow against container for leverage.
对于开伞把手在伞包底部的情况：将肘部靠在伞包上，以便发挥杠杆作用

d. pilot chute hesitation:
引导伞迟滞：

(1) Twist while looking over the right shoulder to modify the airflow.
应扭动腰部，视线越过右肩膀往上看，以改变气流。

(2) Repeat over the left shoulder.
在左肩膀方向重复。

4. Practice for deployment handle problems and pilot chute hesitation.
练习如何解决开伞把手的问题和引导伞迟滞

5. Review premature container opening in freefall for hand deployment:
复习在自由落体状态下伞包过早打开的情况（仅限手抛式开伞）：
   a. Attempt to locate and deploy the pilot chute first.
   首先尝试找到和释放引导伞。
   b. If the pilot chute can't be located after two tries or if deploying the pilot chute results in a partial malfunction, cut away and deploy the reserve.
   如果两次尝试后无法找到引导伞，或者如果释放引导伞导致部分故障，则切伞并开备伞。

6. Review student-in-tow procedures for static-line: Signal to the instructor readiness to deploy the reserve once the static line is cut.
Static Line 学生复习被飞机拖拽时的紧急程序：使用手势向教练示意，表示做好了一旦 Static Line 被切断就开备伞的准备。

7. Practice for recognizing and responding to total and partial malfunctions (from Category A procedures).
练习如何识别和应对完全故障和部分故障（参考 A 单元的流程）。

8. Review minimum cutaway altitude and reserve deployment without cutaway if necessary.
复习最低切伞高度，如有必要，在不切伞的情况下开备伞。
   a. Decide to cut away by 2,500 feet and act.
   在落到 2500 英尺高度之前决定是否切伞并实施这个决定。
   b. If below 1,000 feet without a functioning canopy, deploy the reserve (will result in a cutaway on an SOS system).
   如果在 1000 英尺以下降落伞不能正常使用，则开备伞（对于单把手紧急系统，会导致切伞）
   c. If in a canopy entanglement with another jumper below 1,000 feet and it appears the canopies cannot be separated in time for a safe landing, deploy the reserve (will result in a cutaway with the SOS system, so may not be an option).
   如果在 1000 英尺以下降落伞与另一个跳伞者的降落伞缠绕在一起，并且两个降落伞似乎无法及时分开以安全着陆，则开备伞（对于单把手紧急系统，会导致切伞，因此可能不应该这么做）。
   d. Both parachutes deployed:
   主伞和备伞都打开的情况：
      (1) Biplane—do not cut away, steer the front canopy gently using toggles or leave the brakes stowed and steer by pulling on the rear risers; leave brakes stowed on the back canopy; PLF.
      「两伞一前一后的情况」—不要切伞，通过前伞的刹车棒轻轻控制转向，或者不释放前伞的刹车棒，通过前伞的后组提带进行控制；后伞的刹车棒则不要释放；着陆时执行 PLF。
   e. Side-by-side (two alternatives)
   「一左一右紧贴的情况（两种处理方案）」
      (1) side-by-side alternative one
      方案一
         (i) If the two canopies are not tangled, cut away and fly the reserve to a safe landing.
         如果两个降落伞没有缠绕在一起，切断主伞，用备伞降落到安全的地方。
      (2) side-by-side alternative two
      方案二
         (i) Steer the dominant (larger) canopy gently using toggles or leave the brakes stowed and steer by pulling on the rear risers.
         使用刹车棒轻轻地操纵占主导地位的伞（面积较大的伞），或者不释放该伞的刹车棒，通过其后组提带进行控制。

(ii) Leave the brakes stowed on the other canopy.
另一个降落伞的刹车棒不要释放。
(iii) Make a parachute landing fall on landing.
着陆时执行 PLF。

f. Downplane—cut away the main canopy.
主伞和备伞分处两边的情况：切断主伞。

g. Premature deployment in aircraft「在飞机上过早开伞」:
(1) Attempt to contain the open parachute and inform the instructor.
学生应设法控制住被打开的降落伞并通知教练。
(2) If your parachute goes out the door, follow it immediately, before being extracted.
如果降落伞出了舱门，学生必须在被其拉出舱前紧跟其后。

D. EQUIPMENT「装备」

1. Parachute deployment with opportunities for malfunctions explained (actual deployment on the ground recommended)—
对开伞时可能出现的故障的解释（建议在地面练习）
   a. lost or unrecoverable deployment handle「丢失或无法找回开伞把手」
   b. impossible deployment handle extraction「无法拉出开伞把手」
   c. pack closure「伞包无法打开」
   d. pilot chute hesitation「引导伞迟滞」
   e. pilot chute in tow「引导伞拖拽」
   f. premature deployment (hand deploy)「意外过早开伞（对于手抛式开伞）」
   g. pilot chute entanglement「引导伞缠绕」
   h. horseshoe「马蹄铁故障」
   i. bag lock「D 包锁死」
   j. streamer「降落伞完全不充气」
   k. line-over「线翻越」
   l. 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」
   m. slider hang-up「滑块布挂在上部」
   n. control-line entanglement「刹车线缠绕」
2. Review parachute retrieval after landing.「复习着陆后的降落伞回收」

E. RULES AND RECOMMENDATIONS「规则和建议」

1. Review the USPA Basic Safety Requirements (BSRs) on supervision and progression requirements for students.
复习 USPA 基本安全要求中关于学生的监督和进度的要求。
2. Review the BSRs on wind limits for students (waiverable by a USPA S&TA).
复习基本安全要求中关于学生风速限制的要求（可通过 USPA 安全和培训顾问申请豁免）。
3. Review the BSRs on minimum required deployment altitudes for students and USPA A license holders.
复习基本安全要求中关于学生和 USPA A 执照持有者的最低开伞高度。
4. Review the BSRs on drop zone requirements for students (waiverable by an S&TA) and what is considered a landing hazard.
复习基本安全要求中关于对学生降落区的要求（可通过安全和培训顾问申请豁免），以及什么被视为着陆危险障碍。

F. SPOTTING AND AIRCRAFT「看点定位和飞机」

1. Minimum, careful movement in the aircraft helps prevent premature activation.

在飞机上最低限度的、小心的移动有助于防止意外过早开伞。

2. Runway lengths and headings (use of a compass)
跑道长度和朝向（使用指南针）
   a. The runway heading provides a reference for direction (north, south, east, and west).
跑道朝向可作为方向判断（东西南北）的参考。
   b. The runway length provides a reference for judging distance from the air (in tenths of a mile for GPS and Loran).
跑道长度为在空中判断距离提供了参考（GPS 和 Loran 导航系统以十分之一英里为单位）。
3. Winds are described by their direction of origin, said as a compass heading (for example, “The winds are two-seventy,” means the winds are blowing from the west).
风是以为其来源方向表示的，具体以磁航向表示（例如“270 度的风”指风是从正西边吹来）
4. Avoid runways and approaches, including getting clear of a runway after landing on or near one.
跳伞者应避开跑道和进近中的飞机，如果在跑道上或跑道附近降落，应快速撤离跑道。
5. Discuss local aircraft traffic approach altitudes and landing patterns and their relationship to canopy approach and landing patterns. (See the illustration below, and also refer to the illustration in FAA Advisory Circular 90-66, Appendix 3, in SIM Section 9-2.)
讨论当地飞机交通进近高度和着陆航线及其与降落伞的进近和着陆航线的关系（见下图，也可建议参考研究 SIM 9-2 附录三的联邦航空局咨询通告 90-66 中的插图）。
6. Crossing the runway「穿越跑道」
   a. Know the airport and drop zone rules about crossing a runway.
了解机场和跳伞基地有关穿越跑道的规定。
   b. If allowed, look both ways and minimize the time spent on the runway.
如果允许穿越跑道，两个方向都要看，并尽量减少处于跑道上方的时间。

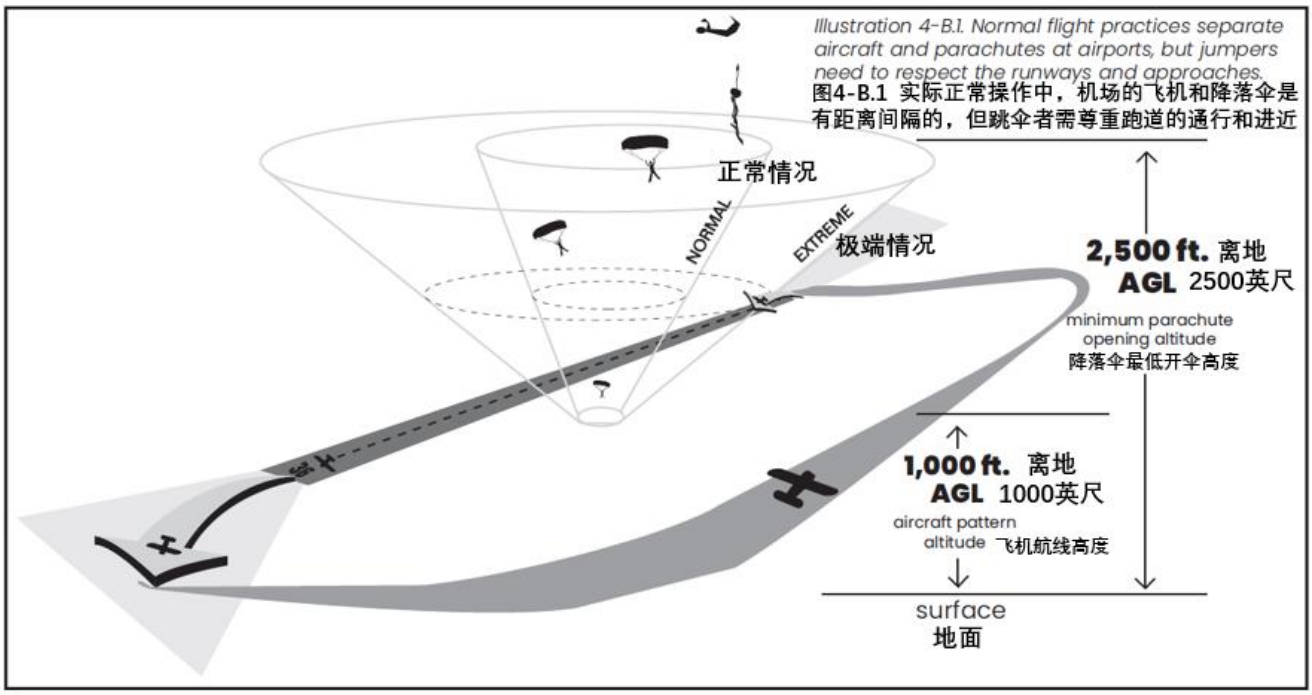

Illustration 4-B.1. Normal flight practices separate aircraft and parachutes at airports, but jumpers need to respect the runways and approaches.
图4-B.1 实际正常操作中，机场的飞机和降落伞是有距离间隔的，但跳伞者需尊重跑道的通行和进近

dive flows「跳伞流程」

CATEGORY B FREEFALL DIVE FLOWS「B 单元自由落体流程」

AFF「AFF」

- Exit in a relaxed arch.「在放松的弓形姿态中出舱」。
- Instructors release arm grips.「教练松手」。
- Circle of Awareness.「高度意识（看高度）」。
- Practice deployments until comfortable.「练习模拟开伞直到熟练」。
- Altitude, arch, legs, relax.「高度、弓形、控腿、放松」。
- Extend legs for three seconds and hold.「双腿伸展 3 秒并保持」。
- Altitude, arch, legs, relax.「高度、弓形、控腿、放松」。
- Repeat as altitude permits.「如果高度允许的话重复上述动作」。
- Team turns (if trained).「教练辅助转弯（如果培训过相关内容）」。
- Begin wave off at 5,500 feet.「在 5500 英尺高度开始挥手示意」。
- Pull by 4,500 feet. 「在 4500 英尺开伞」。

IAD AND STATIC LINE「IAD 和 Static Line」

- Check deployment device prior to climbout.「爬出机舱前检查开伞装置」。
- Climb out.「爬出机舱」。
- Exit on command with legs extended. 「听指令出舱，双腿伸展」。
- Practice deployment with count to track time.「练习模拟开伞，并计数以跟踪时间」。
- Check canopy.「检查降落伞」。

TANDEM「双人伞」

- Initiate count after instructor's OK.「在教练给出 OK 信号后，开始做出舱信号」。
- Exit in a relaxed arch.「在放松的弓形姿态中出舱」。
- Altitude, arch, legs, relax.「高度、弓形、控腿、放松」。
- Practice deployment until smooth and comfortable.「练习模拟开伞，直到平稳舒适」。
- Altitude, arch, legs, relax. 「高度、弓形、控腿、放松」。
- Extend legs and hold for three seconds.「双腿伸展 3 秒并保持」。
- Altitude, arch, legs, relax.「高度、弓形、控腿、放松」。
- Repeat as altitude permits or turns (if trained).
  「如果高度允许的话，重复上述动作，或练习转弯（如果培训过相关内容）」。
- Begin wave-off by 6,000 feet.「在 6000 英尺处开始挥手示意」。
- Pull by 5,500 feet.「在 5500 英尺开伞」。

CATEGORY B CANOPY DIVE FLOW「B 单元开伞后流程」

- Release brakes and correct routine problems.「释放刹车棒，解决常见开伞故障」。
- Look left, turn left.「向左看，再向左转」。
- Look right, turn right.「向右看，再向右转」。
- Flare「拉平」。
- Check altitude, position, and traffic.「检查高度、位置、交通」。
- Find landing area and pattern entry point.「找到着陆区和着陆航线起始点」。
- Divide flight path by thousands of feet.「以千英尺为单位划分飞行路线」。
- Instructor explains minor canopy problems and remedies(tandem only).
  「教练解释降落伞可能出现的小问题和补救措施（仅限双人伞）」。
- Look at runway and determine compass heading.「观察跑道，确定方向」。

- Steer over correct portion of flight path until 1,000 feet.
  「沿着飞行路线的正确部分控制降落伞飞行直至 1000 英尺高度」。
- Look for obstacles around landing area.「在着陆区周围寻找障碍物」。
- Follow preassigned pattern over landing area or alternate.「按照预先计划的航线着陆降落或者进行备降」。
- Flare to land and PLF if necessary.「拉平着陆，如果需要的话，执行 PLF 着陆」。

CATEGORY B INSTRUCTOR NOTES「B 单元教练注意事项」

- The instructor must consider carefully before advancing students more quickly than the recommended progression during the rudimentary skills training in Categories A-C. Repetition of fewer skills during the initial categories improves success in later categories and leads to higher overall satisfaction for the student.

在 A 至 C 单元基本技能培训期间，教练如果打算让学生比建议的进度更快地学习，必须先三思。在最初的单元中反复练习较少的技能可以提高以后单元的成功率，并能让学生有更高的总体满意度。

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The United States Parachute Association represents and works for skydivers like you. USPA maintains FAA-recognized skydiving training, licensing, and rating programs, sanctions competitions and much more.
美国跳伞协会是跳伞者的代表，并为跳伞者工作。USPA 维护着联邦航空局认可的跳伞培训、执照和评级程序、批准竞赛等等。

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维持一个强大的跳伞者协会需要你的参与。请通过当地的跳伞基地加入，线上登录 uspa.org 或致电(540) 604-9740。

category b quiz「B 单元小测」

ADMINISTERED PRIOR TO CONDUCTING JUMPS IN THE NEXT CATEGORY「测试应在进入下一单元跳伞前进行」

Quiz answers are listed in Appendix B.「测验答案列在附录 B 中」

1. Who must directly supervise your student training jumps?
   谁必须直接监督学生的跳伞训练？
2. What is your most important task when in freefall?
   自由落体时，最重要的任务是什么？
3. What are the maximum winds in which any student may jump?
   学生跳伞的最大风速限制是多少？
4. How would you clear a pilot chute hesitation?
   要如何应对引导伞迟滞的问题？
5. In the event of a canopy problem, students should decide and act about executing emergency procedures by what altitude?
   降落伞发生问题时，学生应该在什么高度以上决断是否实施紧急程序，并执行决定？
6. How would you address the following routine opening problems: line twist, slider up, end cell closure?
   应该如何解决以下常见开伞问题：线缠绕、滑块布挂在上部、末端气室不完全充气？
7. What is the appropriate action if below 1,000 feet without a landable parachute?
   如果在 1000 英尺以下仍没有可用于正常降落的降落伞，应该采取什么措施？
8. If the pilot chute goes over the front of the canopy after it has opened, how can you tell if it's a malfunction?
   如果开伞后，引导伞飞到降落伞面前，怎么能判断这个情况是否会造成问题？
9. What is the correct response to an open container in freefall using a hand-deployed system?
   使用手抛式开伞系统时，在自由落体状态下，应怎么正确应对伞包过早打开的情况？
10. If part of the deployed parachute is caught on the jumper or the equipment (horseshoe), what is the correct response?
    如果打开的降落伞的一部分被身体或装备缠住（马蹄铁故障），正确的应对措施是什么？
11. If the pilot chute extracts the deployment bag from the parachute container(backpack) but the deployment bag fails to release the parachute canopy for inflation, what is the correct response?
    如果引导伞从伞包中抽出 D 包，但 D 包不能释放降落伞进行充气，正确的应对措施是什么？
12. What are the compass headings of the runway nearest the DZ at your airport?
    离降落区最近的机场的跑道的磁航向是多少？
13. What compass directions do the runway heading numbers represent (northeast-southwest; north-south, etc.)?
    跑道航向编号表示什么的磁航向（东北-西南、北-南…）？
14. How long is the longest runway at your airport?
    本地机场最长的跑道有多长？
15. Describe the three legs of the canopy landing pattern with relation to the wind direction.
    描述降落伞着陆航线的三边与风向的关系。
16. At what altitude over the ground do aircraft enter the traffic pattern at your airport?
    飞机在地面上什么高度进入本地机场的起落航线？
17. Why is it undesirable to land off the end of a runway?
    为什么在跑道的尽头着陆是不好的？

4-C C 单元 Category C

INTRODUCTION「序言」

By this time, you have had several opportunities to learn controlled, stable fall. Freefall students (AFF and tandem) have a head start on the point of the next lesson's freefall skills: relaxed control using the procedure, "altitude, arch, legs, relax."
到目前为止，学生已有多次机会学习受控的、稳定的自由落体。经历过自由落体的学生（AFF 和双人伞培训方法）已率先学习了下一节课程的自由落体技能：通过“高度、弓形、控腿、放松”的流程在放松状态下进行自由落体控制。

Tandem and AFF students usually begin this category with two AFF Instructors but should jump with only one before advancing.
双人伞和 AFF 学生通常在两位 AFF 教练的帮助下开始这一单元，但在进入下一单元之前将只与一个教练跳伞。

IAD and static-line students perform the first jump in this category identically to the last jump in Category B, preferably on the same day. On subsequent jumps, they practice controlled freefall for ten seconds before deployment on at least two jumps to become accustomed to the shift in direction of the relative wind from ahead to below. It also introduces them to the speed of a near-terminal-velocity freefall.
IAD 和 Static Line 学生在本单元的第一跳与在 B 单元中的最后一跳相同，且最好在同一天进行。在随后的跳伞中，学生需要在至少两次跳伞中练习在开伞之前保持 10 秒受控自由落体，以适应相对气流由从飞机前方吹来到从下方吹来的方向变化。这同时也让学生能够初次进行接近终端速度的自由落体。

You need to establish confidence and relaxed freefall control. A controlled freefall in Category C may include some random heading drift, which you learn to lessen by relaxing and focusing on the basics: altitude, arch, legs, and relax.
学生需要建立信心，在放松状态下进行自由落体控制。C 单元的受控自由落体中，学生可能会有一些随机的朝向偏移。放松并专注于基础：“高度、弓形、控腿、放松”，可以减少朝向偏移的发生。

The instructor shows you more about how to plan a canopy pattern for various wind speeds and directions to improve traffic flow and avoid conflicts with obstacles and other jumpers. You learn to predict, avoid, and react to turbulence induced by wind over obstacles and heated areas.
教练会向学生介绍更多关于如何针对不同的风速和风向来规划降落伞航线的知识，以改善交通情况，避开障碍物，并避免与其他跳伞者的航线发生冲突。学生将学会如何预测、避开和应对乱流（乱流一般因风吹过障碍物和较热的区域引起）。

You'll learn ways to approach an off-field landing, and the drop zone manager explains how off-field landings may affect neighbor relations.
学生将学习如何进行场外降落，跳伞基地管理者也会解释场外降落可能如何影响邻居关系。

You'll meet the FAA-rated parachute rigger, who packs and maintains the reserve parachute. He or she will familiarize you with the closed parachute system, and you'll observe the pre-flight equipment check.
学生将见到联邦航空局认证的降落伞装备师。装备师负责备伞的叠伞和保养。降落伞装备师会让学生熟悉已关包的降落伞，学生也将观察学习如何进行飞行前的装备检查。

Emergency review includes discussion on an inadvertently opened parachute in and around the aircraft and how to avoid and respond to it. Also, your instructor provides more details on recognizing and avoiding landing obstacles and how to approach off- field landings.

紧急情况回顾的内容包括关于机内以及机外的意外开伞的讨论，以及如何避免和应对这种情况。同时，教练也会教授更多关于识别和避开着陆障碍物以及如何进行场外降落的细节。

Instructor: Transition Protocol「教练：转换规则」

The USPA Tandem program terminates after Category B. All former tandem students may continue in the AFF program, or the remainder of the USPA IAD or static-line progression.

USPA 双人伞培训方法的内容在 B 单元后结束，所有原双人伞学生应转至 AFF 培训方法，或 IAD、Static Line 培训方法。

Crossover students to AFF who have completed Category B in the IAD and static-line program will need additional training on the AFF climbout, set-up, and count; AFF freefall communications; use of the altimeter in freefall; and the main parachute deployment device, including deployment device malfunctions. IAD and static-line students may make the first jump in this category with one AFF Instructor on the recommendation of the USPA IAD or Static-Line Instructor and with the concurrence of the USPA AFF Instructor.

在 IAD 或 Static Line 培训方法中完成 B 单元学习的、转换至 AFF 培训方法的学生需要额外培训以下内容：AFF 培训方法中的爬出机舱、准备就位和出舱信号；自由落体时与教练的沟通；自由落体时高度表的使用；主伞开伞装置的使用，包括开伞装置故障的相关知识。IAD 和 Static Line 学生可在 USPA IAD 或 Static Line 教练的建议下，并且在 USPA AFF 教练的同意下，与一名 AFF 教练进行该单元的第一跳。

Crossover students to IAD or static line who have completed Category B in another training method will need additional training on the IAD or static-line climbout, set-up, and exit commands and use and malfunctions of the IAD or static-line deployment system. AFF and tandem students who have completed Category B must demonstrate a stable practice deployment on an IAD or static-line jump before proceeding to a clear and pull.

在其他培训方法中完成 B 单元学习的、转换至 IAD 或 Static Line 培训方法的学生需要额外培训以下内容：IAD 或 Static Line 培训方法中的爬出机舱、准备就位和出舱指令，以及 IAD 或 Static Line 开伞系统的使用和故障。完成 B 单元学习的 AFF 和双人伞学生在开始练习净空开伞之前，必须能够在进行 IAD 或 Static Line 跳伞时进行稳定的模拟开伞。

AFF「AFF」

- two jumps　2 跳

IAD/STATIC-LINE「IAD 或 Static Line」

- three jumps　3 跳

RECOMMENDED MINIMUM DEPLOYMENT「建议最低开伞高度」

- 4,000 feet
  4000 英尺

Category at a Glance「单元概览」

ADVANCEMENT CRITERIA「晋级标准」

EXIT AND FREEFALL「出舱和自由落体」

AFF STUDENTS「AFF 学生」

- demonstrate the ability to freefall safely with one AFF Instructor
  有能力仅与一名 AFF 教练一起安全进行自由落体
- stable solo deployment at assigned altitude
  在指定的高度稳定地独立开伞

IAD AND STATIC-LINE STUDENTS「IAD 和 Static Line 学生」

- one stable clear and pull
  一次稳定的净空开伞
- two stable ten-second freefalls
  两次稳定的 10 秒钟自由落体

ALL STUDENTS「所有学生」

- control within five seconds of exit
  出舱后 5 秒内，保持控制
- stable, relaxed fall
  稳定、放松的自由落体
- ability to dampen turns and heading drift using “altitude, arch, legs, relax”
  能通过“高度、弓形、控腿、放松”的技巧抑制不受控转弯和方向偏移
- wave-off and pull at the assigned altitude
  在指定高度挥手示意并开伞

CANOPY「伞控」

- fly a recognizable pattern with minimal assistance
  在尽量少协助的情况下按可辨识的航线飞行
- flare with minimal assistance
  在尽量少协助的情况下刹车拉平

SPOTTING AND AIRCRAFT「看点定位和飞机」

- understanding of how to plan and adjust the landing pattern for wind speed and direction
  理解如何根据风速和风向规划和调整着陆航线

ORAL QUIZ「口试」

BOOK STUFF「参考资料」

- review BSRs on equipment required for student jumps, SIM Section 2-1.M.2 – 5
  复习基本安全要求中关于学生跳伞所需的装备（SIM 2-1.M.2-5）
- study FAR 105.43.b.1 (SIM Section 9-1) regarding the requirements for periodic inspection and repacking of reserve parachute systems
  学习 FAR 105.43.b.1（SIM 9-1）中关于定期检查和备伞系统重新叠伞的要求
- discuss with the drop zone owner the ramifications of off-field landings, both legal and from a neighbor and public relations perspective
  从法律和邻居及公共关系的角度，与跳伞基地所有者讨论场外降落的后果
- read the canopy owner’s manual

CATEGORY C: LEARNING AND PERFORMANCE OBJECTIVES 「学习和能力表现目标」

- unassisted freefall with heading maintenance「无辅助自由落体且保持朝向」
- hover control「悬停控制」
- solo deployment「独立开伞」
- landing patterns for higher winds「大风着陆航线」
- downwind landings「顺风降落」
- wing loading「翼载」
- accidental opening review「意外开伞情况的复习」
- turbulence「乱流」
- landing off「场外着陆」
- obstacle recognition「地面障碍物的识别」
- the FAA rigger「联邦航空局认证的降落伞装备师」
- the closed parachute system「已关包的降落伞系统」

A. EXIT AND FREEFALL「出舱和自由落体」

1. Pull priorities:
   开伞的优先事项：
   a. Jumpers must deploy at the planned altitude, regardless of stability.
      无论稳定性如何，跳伞者必须在计划高度开伞。
   b. Priorities are in the following order of importance (top down):
      优先事项按重要性排序（从上到下）：
      (1) Pull「开伞」
      (2) Pull at the correct altitude「在正确的高度开伞」
      (3) Pull while stable「以稳定姿态开伞」
2. Review of smooth climbout and exit (minimal assistance)
   回顾如何平稳地爬出机舱和跳出（在尽量少的协助下）
   a. exact hand and foot placement
      手脚摆放位置准确
   b. smooth launch to reduce momentum
      平稳地跳出，减少冲力
   c. correct presentation of hips and chest to the relative wind
      髋部和胸部正确地迎向相对气流
   d. legs out for a few seconds to add control
      把双腿伸出几秒钟以增强控制力
3. Single-instructor exit (AFF, when applicable)
   单名教练陪同出舱（AFF，如适用）
   a. Revise the climbout procedure for one instructor.
      修改爬出机舱的程序，以适配仅有一名教练陪同的情况。
   b. Prepare for slightly different results after launch with one instructor (typically more vertical).
      与一名教练一起出舱的效果略有不同（通常姿态更垂直）。
4. Review of stability recovery and maintenance “altitude, arch, legs, relax” (IAD and static-line students only after successful clear and pull)—
   回顾如何恢复稳定和保持稳定：“高度、弓形、控腿、放松”（IAD 和 Static Line 学生须先能成功完成净空开伞）—
   a. A.I.R. Provided you are Altitude aware, In control, and Relaxed (AIR), you may continue in freefall and deploy at the assigned altitude.
      A.I.R.——如果学生有足够的高度意识（Altitude aware）、能保持控制（In Control），且处于放松状态

（Relaxed），则可以继续进行自由落体并在指定高度开伞。

b. If you are above your assigned deployment altitude but cannot control your freefall (spinning rapidly or tumbling) employ the stability recovery and maintenance procedure. If unsuccessful after 5 seconds deploy your main canopy immediately. Deploy your main canopy at the assigned deployment altitude regardless of stability.
如果学生处于指定的开伞高度以上，但不能控制自由落体（快速旋转或翻滚），应采取恢复稳定和保持稳定的程序，如果超过 5 秒仍未成功恢复，则立即打开主伞。如果已下落到指定开伞高度，不管稳定性如何，都要打开主伞。

c. If you are above your assigned deployment altitude and falling in a back-to-earth orientation, roll to one side to recover to a stable, belly-to-earth body position. Check altitude, arch, look towards the ground to the right, bring the right arm in across your chest, as your body rolls to the right and you are facing the ground bring your right arm back to the freefall position. Check altitude. This is commonly referred to as the "roll out of bed" technique.
如果学生处于指定开伞高度以上，并以背部朝下的姿态下落，则需要翻滚向一边以恢复到稳定的、腹部朝下的姿态。首先检查高度、然后做弓形，看向右边的地面，右臂越过胸部，当身体向右翻滚，脸朝地面时，再把右臂放回去，做回自由落体姿态。检查高度。该技巧俗称为“翻滚起床”。

d. know the altitude by reading the altimeter or counting from exit (depending on exit altitude).
通过看高度表或从出舱开始计数来了解高度是多少（取决于出舱高度）。

e. arch at the hips to improve belly- to-wind stability.
顶胯以提高腹部迎风的稳定性。

f. check your leg position and adjust as needed (probably extend to 45 degrees).
检查腿的姿势并根据需要调整（可能要把双腿伸展到 45 度）。

g. relax by taking a breath and letting go of unwanted body tension.
深呼吸放松，并释放不必要的身体紧张。

h. recognize heading (actively correct only if turn training was introduced in Category B).
识别朝向（只有在 B 单元中进行过转向培训时才能主动纠正朝向）

5. Alternate freefall altitude references
其他自由落体期间的高度参考

a. Judge altitude by keeping track of time (average ten seconds for the first 1,000 feet, 5.5 seconds for every additional 1,000 feet).
通过跟踪时间流逝来判断高度（出舱后的前 10 秒内约下落 1000 英尺，此后每 5.5 秒下落 1000 英尺）。

b. Look at the ground during the climb to altitude and cross check against the altimeter.
在乘飞机爬升的过程中观察地面，并交叉对照高度表读数。

c. Observe the cloud bases on the ride to altitude to use later as an altitude reference.
在乘飞机爬升的过程中观察云层，以稍后将其作为高度参考。

d. Look at the ground after initiating deployment and while waiting for inflation; check what you observed against the altimeter after opening.
在启动开伞程序后，等待伞布充气时看看地面；开伞后，将高度表读数与所观察到的地面情况进行对照。

6. IAD and static-line students (after first successful clear and pull)：
IAD 和 Static Line 学生（第一次成功净空开伞后）：

a. exposure to continuous freefall (two stable ten-second delays recommended to complete Category C)
连续进行自由落体训练（建议两次出舱后 10 秒再开伞，期间保持稳定，以完成 C 单元训练）

b. transition of the relative wind from opposite the aircraft heading to below
适应相对气流由从飞机前进方向吹来转换至从下方吹来的过渡过程

c. altitude, arch, legs, relax
高度、弓形、控腿、放松

d. wave-off to signal other jumpers prior to deployment

开伞前挥手以向其他跳伞者示意。

B. CANOPY「伞控」

1. Wing loading and canopy size「翼载和降落伞尺寸」
   a. The wing-loading ratio is the jumper's exit weight (geared up) divided by the square footage of the canopy.
   翼载比值是跳伞者出舱时（穿着装备）的重量除以降落伞面积（单位为平方英尺）。

WING LOADING EXAMPLES「翼载算例」	
jumper's exit weight 跳伞者出舱时的重量	215（磅）
divided by canopy size (sq. ft.) 除以降落伞面积（平方英尺）	280
wing loading 得到翼载	0.77
jumper's exit weight 跳伞者出舱时的重量	215（磅）
divided by canopy size (sq. ft.) 除以降落伞面积（平方英尺）	195
wing loading 得到翼载	1.1

   b. The canopy manufacturer publishes wing loading or load recommendations for each model of canopy.
   降落伞制造商通过以下方式发布每种类型的降落伞的翼载或载荷建议。
      (1) in the canopy owner's manual
      在降落伞用户手册中
      (2) on the manufacturer's website
      在制造商的网站上
   c. Canopy performance changes with wing loading.
   降落伞性能随着翼载的变化而改变。
      (1) With a higher wing loading, expect:
      在更重的翼载下，预计有以下效果：
         (i) faster forward speed
         更快的前进速度
         (ii) faster descent rate
         更快的下降速度
         (iii) quicker turns
         更快的转向
         (iv) steeper and longer dive from a turn
         转向导致更陡的更长时间的俯冲
         (v) more violent malfunctions
         发生故障时，故障来得更猛烈
         (vi) more skill to flare correctly
         需要更高的技能以正确地拉平
      (2) With a lighter wing loading, expect
      在更轻的翼载下，预计有以下效果：
         (i) less drive against a strong wind
         在强逆风中较难前进

(ii) slower turns
转向速度更慢
(iii) more forgiveness of landing errors
着陆失误的容错率更高
(iv) less predictable in turbulence
遇到乱流更难控制

d. Use the example to calculate the wing loading for the canopy the student is about to jump (one of the Category C advancement criteria).
使用上面的示例计算学生将要跳的降落伞的翼载（C 单元晋级标准之一）。

e. Canopies may appear easier to land with more weight, to a point.
在某种程度上，载荷更重时，降落伞似乎更容易进行降落。
(1) A good landing in ideal conditions does not mean a smaller canopy is safe to jump in all conditions.
能够在理想条件下进行良好的着陆并不意味着所有条件下更小的降落伞都是安全的。
(2) A more highly loaded canopy will stall at a higher airspeed.
一个负载更高的降落伞会在更高的空速下失速。

f. With the same wing loading a smaller canopy of the same model will exhibit more lively performance characteristics.
翼载相同时，同一型号的更小的降落伞将表现出更高的性能。
(1) faster turns and turn response
更快的转向和更敏感的转向
(2) quicker dynamic stall response
更快发生动态失速

2. Converting forward speed to lift:
将前进速度转换成升力：

a. Flaring the canopy quickly to half brakes causes the canopy to slow down abruptly.
快速地将降落伞拉平到半刹车位置会使降落伞突然减速。

b. Your momentum causes you to swing forward briefly, raising the front of the canopy and flattening the glide.
惯性会使跳伞者被短暂地向前甩、降落伞前部被抬高、滑翔轨迹变平。

c. Continue to flare, braking the canopy more and holding the high nose angle to maintain your lift while reducing the forward speed.
继续拉平，加深刹车，保持降落伞处于高俯仰角姿态，以保持升力，同时降低前进速度。

d. Time your flare so your feet touch the ground before you begin to swing back under the canopy (dynamic stall) or begin to fly backwards (full stall).
选好拉平的时机，在身体开始向后甩（动态失速）或倒退飞行（完全失速）之前，脚刚好接触地面。

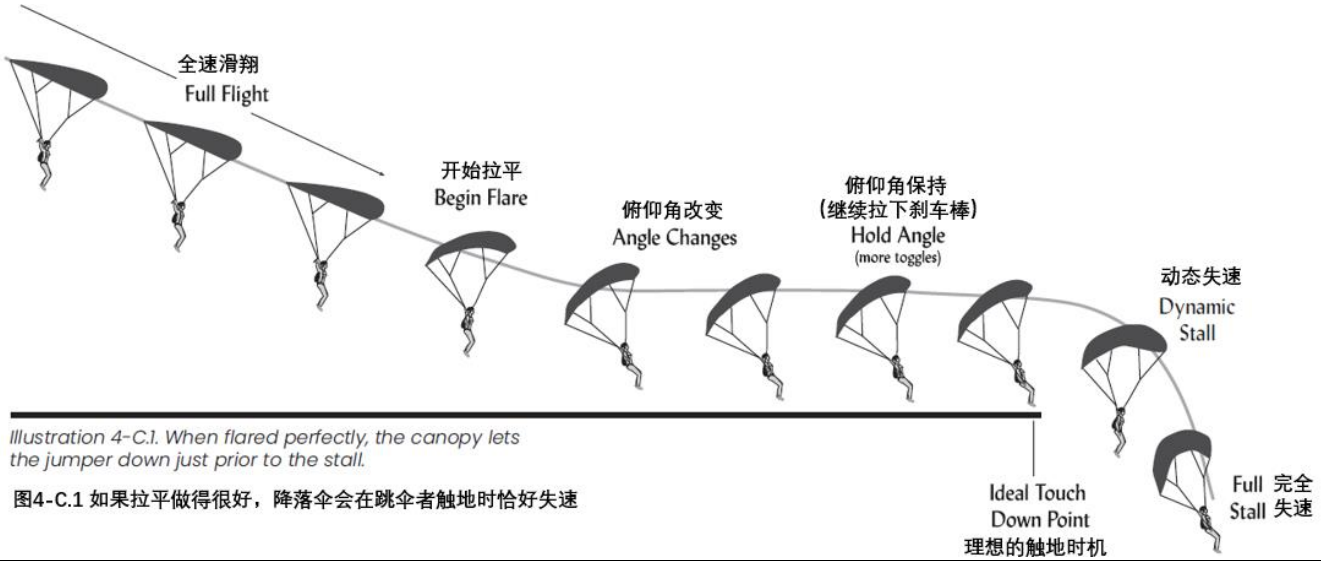


Illustration 4-C.1. When flared perfectly, the canopy lets the jumper down just prior to the stall.

图4-C.1 如果拉平做得很好，降落伞会在跳伞者触地时恰好失速

3. Turbulence sometimes occurs in the landing area.
着陆区有时候会有乱流。
   a. Anticipate turbulence 10-20 times the height of an obstacle on the downwind side.
   在障碍物下风处，障碍物高度 10-20 倍的距离范围内，预计会出现乱流。
   b. The effects and likelihood of turbulence increase with wind speed.
   随着风速的增大，乱流的影响会增大，出现乱流的可能性也会增加。
   c. Turbulence often occurs—
   乱流经常发生在—
      (1) near runways「跑道附近」
      (2) alongside roads「道路沿线」
      (3) where two areas of different colors or textures meet「两块不同颜色或质地的区域接壤的地方」
      (4) behind other canopies (wake turbulence)「其他降落伞后面（尾流乱流）」
      (5) over irregular terrain「不规则地形上」
      (6) downwind of the propeller wash of a taxiing aircraft「滑行中的飞机的螺旋桨尾流的下风处」

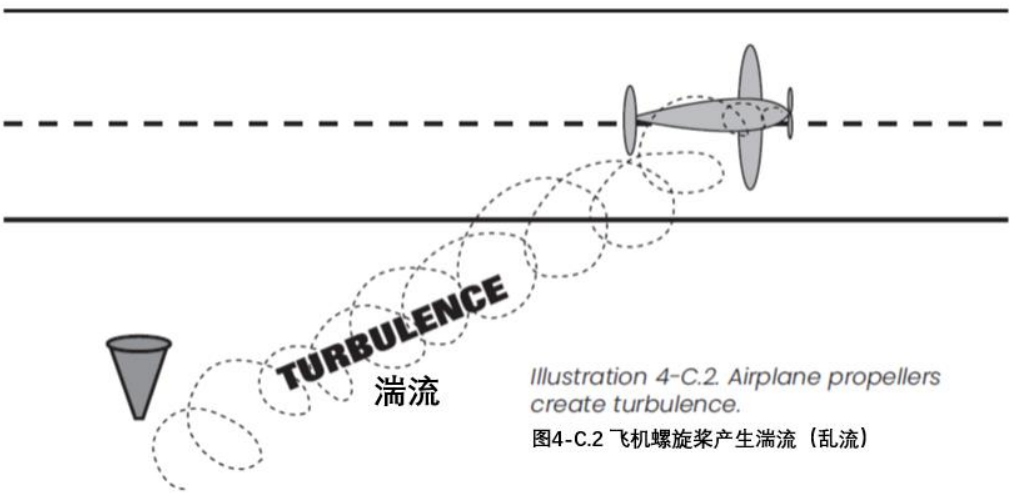
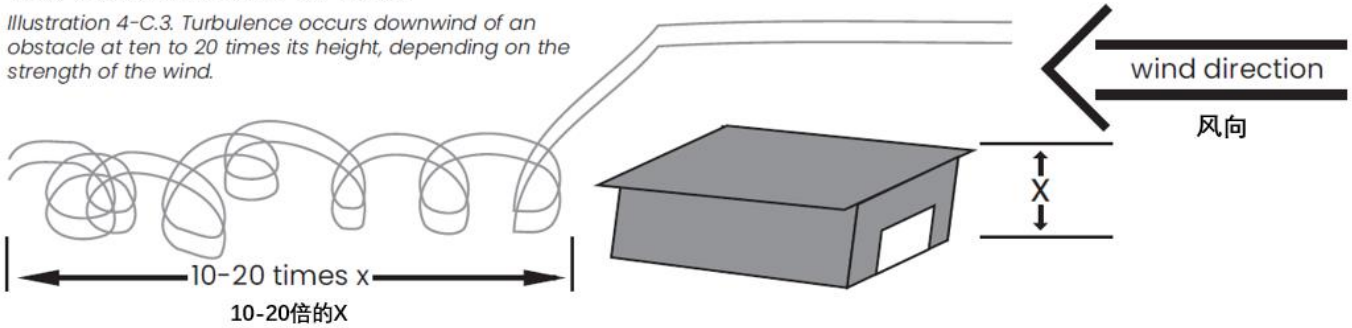


Illustration 4-C.2. Airplane propellers create turbulence.
图4-C.2 飞机螺旋桨产生湍流（乱流）

图4-C.3 在障碍物下风处（在10-20倍障碍物高度的距离范围内，具体取决于风力大小）会产生乱流

Illustration 4-C.3. Turbulence occurs downwind of an obstacle at ten to 20 times its height, depending on the strength of the wind.



4. When flying in turbulence—
在乱流中飞行时—
   a. Maintain the desired heading using smooth but effective toggle input.

平稳且有效地使用刹车棒微调以保持所需的朝向。

b. Fly full speed or as directed in canopy owner's manual.
全速飞行，或按照降落伞用户手册的指示飞行。

c. Prepare for a hard landing.
为硬着陆做准备。

5. Recognition of a clear field
空旷区域的识别

a. Power lines run along roads and between buildings, as well as randomly in open fields.
高压线一般在道路沿线和建筑物之间，在开阔区域中也会随机出现。

b. A row of vegetation often hides a fence.
一排植被通常意味着隐藏的围栏。

c. Rocks, hills, and other terrain irregularities often remain invisible until just prior to touchdown.
岩石、小丘和其他不规则地形通常是看不见的，直到快着陆前。

d. Inspect an unfamiliar landing area more closely at every 500-foot interval during descent and continuously below 500 feet.
对于不熟悉的着陆区要更仔细地观察，在下降过程中，每隔 500 英尺观察一次，并在 500 英尺以下不断地观察地形。

6. Planning a landing pattern (intended landing area or alternate) for smooth flow and separation of traffic:
规划好着陆航线（计划着陆区或备降场地），以实现顺畅的交通，并保持与其他跳伞者的间距：

a. Jumpers on left-hand (left-turning) approaches should land on the left side of the landing area; jumpers on right-hand approaches should land on the right side of the landing area to prevent conflicts.
为防止冲突，走左手航线（左转）的跳伞者应降落在着陆区的左边；走右手航线的跳伞者应降落在着陆区的右边。

b. The turn from base leg to final is the most hazardous because of opposite approaching traffic.
从基线边（第二边）到最后进近（第三边）的转向是最危险的，因为可能遇到正对面接近的跳伞者。

c. See and avoid.
观察并避开。

7. Downwind landings are better than low turns.
顺风降落比低转要好。

a. On calm days, unexpected wind shifts sometimes require jumpers to land with a light wind, instead of against it.
在风力温和的日子里，意外的风向变化有时会要求跳伞者在微风中进行顺风降落，而不是逆风降落。

b. On windy days, jumpers sometimes fly downwind too long and run out of time to complete a turn into the wind, also requiring them to land with the wind.
在大风的日子里，跳伞者有时会向下风向飞太长时间，导致来不及完成转向以能够逆风降落，这种情况也会要求跳伞者顺风降落。

c. When faced with deciding between a low turn or a downwind landing, the downwind landing is the correct decision.
当面临要低转还是顺风降落的决定时，顺风降落是正确的决定。

d. When making a downwind landing—
顺风降落时—

(1) Flare at the normal altitude, regardless of ground speed.
不管地速如何，在正常高度拉平。

(2) Roll on landing, using the PLF hard-landing procedure.
使用 PLF 硬着陆程序，在着陆时翻滚。

(3) Tripping when trying to run out a high-speed landing can result in serious neck injury or death.
在较高速度下尝试跑步着陆时，如果绊倒可能会导致严重的颈部受伤或死亡。

8. When to attempt a stand-up landing:
   什么时候可以尝试站立着陆：
   a. when you're in control of all the variables
      有把握控制所有的变量时
   b. after a good flare at the appropriate altitude
      在适当的高度正确拉平后

C. EMERGENCY PROCEDURE REVIEW「紧急程序回顾」

Note: Tandem students should additionally review all Category B emergency procedures on the same day before making any jump in Category C. IAD and static-line students should additionally review procedures for deployment handle problems, premature container opening in freefall (hand deployment), and pilot-chute hesitations before making any jump in Category C.

注：双人伞学生在进行 C 单元的任何一跳之前应在当天额外回顾所有 B 单元的紧急程序。在进行 C 单元的任何一跳之前，IAD 和 Static Line 学生应额外回顾以下问题的处理程序：开伞把手的问题、在自由落体状态下伞包意外过早打开的情况（手抛式开伞）、以及引导伞迟滞。

1. Open parachute in aircraft
   在飞机上降落伞被打开的情况
   a. extreme care required when leaning back against anything in aircraft
      背靠飞机上任何东西时都需要非常小心
   b. importance of a pre-jump equipment check before leaving the aircraft
      在出舱前须进行跳伞前装备检查
   c. importance of careful movement near or outside the door, especially with an AAD
      在舱门附近或舱门外须小心移动，特别是在使用自动激活装置（AAD）的情况下
   d. If a parachute opens in the plane:
      如果降落伞在飞机上打开：
      (1) If door is closed, secure the parachute and land with the plane.
          如果舱门是关着的，保护好降落伞，然后和飞机一起降落。
      (2) If the door is open, contain the parachute, close the door, and land with the plane.
          如果舱门是开着的，收住降落伞，关上舱门，然后和飞机一起降落。
      (3) If the parachute goes out the door, so must the jumper.
          如果降落伞已飞出舱门，跳伞者也必须跟着出舱。
2. Importance of deployment at the correct altitude, regardless of stability
   不管稳定性如何，都要在正确的高度开伞
3. If an off-DZ landing is unavoidable—
   如果场外着陆不可避免—
   a. Look for an open, clear, accessible field.
      寻找一个开阔、空旷、易进入的场地。
   b. Decide on an alternate landing area by 2,000 feet.
      在下降到 2000 英尺之前，选定备降场地。
   c. Fly a predictable landing pattern.
      以可预测的着陆航线飞行。
   d. Transpose the planned landing pattern from the intended field onto the alternate field.
      将计划好的着陆航线从预定着陆场地平移至备降场地。
   e. Land well clear of turbulence and obstacles.
      着陆应远离有乱流和障碍物的区域
   f. Prepare for a hard landing in any unfamiliar landing area.
      在任何不熟悉的区域进行着陆时，都要准备好硬着陆。

g. Be considerate of the property owner when leaving the landing area.
离开着陆区域时要为土地所有者考虑。
(1) Cross only at gates or reinforced areas.
仅通过大门或固化地表通行。
(2) Leave all gates as they are found.
所有的大门，原来是什么样，离开后都弄回原样。
(3) Do not disturb cattle.
勿惊扰牛。
(4) Walk parallel to (between) any rows of crops until reaching the end of the field.
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。
(5) Repair or replace any damaged property.
修理或更换任何被损坏的财物。

4. Review of landing priorities
着陆优先事项的回顾
a. Land with the wing level and flying in a straight line.
降落伞伞翼要水平，沿直线飞行。
b. Land in a clear and open area, avoiding obstacles.
在空旷开阔的地方着陆，避开障碍物。
c. Flare to at least the half-brake position.
至少拉平到半刹车位置。
d. Perform a parachute landing fall.
执行 PLF。

5. Collapse an inflated canopy on landing by pulling in one toggle and running toward it.
在着陆时，通过拉其中一个刹车棒，并向降落伞伞布跑去，可让充气的降落伞伞布塌缩。

D. EQUIPMENT「装备」

1. The automatic activation device:「自动激活装置（AAD）」
a. activates the main or reserve parachute
用于打开主伞或备伞
b. is worn only as a back-up
只能作为备份措施使用

Note: Detailed AAD operation is explained in Category D.
注：详细的 AAD 操作将在 D 单元中说明。

2. Observe the instructor performing the pre-flight check:
观察教练如何执行飞行前的装备检查：
a. top to bottom, back—
从上到下，检查伞包背面—
(1) reserve pin in place and straight.
备伞关包针到位并保持笔直
(2) reserve closing loop must have no visible wear.
备伞关包绳不得有任何可见磨损
(3) reserve ripcord cable movement in housing.
备伞开伞拉索是否可以移动
(4) reserve packing data card and seal (especially on an unfamiliar or rental rig).
检查备伞卡（备伞叠伞记录卡）和铅封（尤其是在使用不熟悉的或租用的装备时）
(5) AAD turned on and/or calibrated.
AAD 已开启，并且/或者已校准

(6) 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

(7) main closing loop worn no more than ten percent.
主伞关包绳磨损不超过 10%

(8) pilot chute bridle routing or ripcord cable movement.
引导伞系带的走线，或拉索能否移动

(9) main activation handle in place.
主伞开伞把手就位

b. top to bottom, front—
从上到下，检查伞包前面—

(1) overview operation of three-ring release—pulling the cable releases the rings
三环释放系统的操作概览——拉动切伞把手会释放三环
Note: Pre-flight details for the three-ring release are covered in Category D. Disassembly and maintenance are explained in Category H.
注：三环释放系统的飞行前检查在 D 单元中具体说明。三环释放系统的拆卸和维护在 H 单元中说明。

(2) RSL connection, routing, and basic function to back up the jumper in pulling the reserve following a cutaway
RSL 的连接、走线，以及熟悉 RSL 的基本功能：RSL 是跳伞者切伞后，打开备伞的备份措施
Note: Comprehensive RSL operation is explained in Category E.
注：全面的 RSL 相关知识将在 E 单元中说明。

(3) chest strap and hardware intact
胸带以及胸带的金属部件完好

(4) cutaway handle in position
切伞把手到位

(5) reserve handle in position
备伞把手到位

(6) 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. RULES AND RECOMMENDATIONS「规则和建议」

1. The BSRs list gear requirements for student jumps in Section 2-1.M.2 through 5.
本手册 2-1.M.2 至 5 的基本安全要求列举了关于学生跳伞的装备要求。
2. The FAA also regulates the training and certification of the FAA rigger, according to FAR 65.
联邦航空局还根据 FAR 65 对降落伞装备师的培训和认证进行管理。
3. Some skydiving centers are subject to state and local rules or restrictions concerning landing off the DZ.
一些跳伞基地还需要遵守州和地方的有关场外降落的规定。
4. The student should discuss with the drop-zone staff how an off-field landing may affect the jumper and the DZ.
学生应与跳伞基地工作人员讨论场外降落对跳伞者和跳伞基地的影响。

F. SPOTTING AND AIRCRAFT「看点定位和飞机」

1. The landing pattern is square on a calm day, with each leg based on the canopy's projected glide distance from 300 feet of altitude (see illustration).
在静风的日子里，着陆航线类似正方形，航线每一边的长度为降落伞下降 300 英尺所需的预计滑翔距离（见图）。

a. Each jumper must know his or her own canopy's glide distance from 300 feet in no wind to plan a pattern.
跳伞者必须知道自己的降落伞在无风时下降 300 英尺高度的滑翔距离，以规划航线。

b. The instructor estimates the 300- foot no-wind glide distance for beginning students.

教练替刚开始学习跳伞的学生预估无风时降落伞下降 300 英尺的滑翔距离。

2. The planned final approach must be shortened from the known zero-wind square pattern as the wind increases; for example, cut the final approach approximately in half for ten mph.
以已知的无风正方形航线为基准，随着风速的增加，最后进近边（第三边）须缩短；例如，如果风速为 10 英里/小时，需要将最后进近边（第三边）缩短大约一半。
3. The base leg also shortens as the wind increases; for example, also cut the base leg approximately in half for a ten-mph wind.
随着风速的增加，基线边（第二边）也会缩短；例如，如果风速为 10 英里/小时，也需要将基线边（第二边）缩短大约一半。
4. Plan the 1,000-foot pattern entry point farther upwind as winds increase; for example, double the length of the downwind leg used for calm conditions, ending at the new projected 600-foot point for ten-mph winds.
随着风速的增加，1000 英尺高度的着陆航线起始点须往上风处移动；例如，在风速为 10 英里/小时的情况下，须将无风时的下风边（第一边）的长度增加一倍，下风边（第一边）的终点位于新的预估 600 英尺参考点。

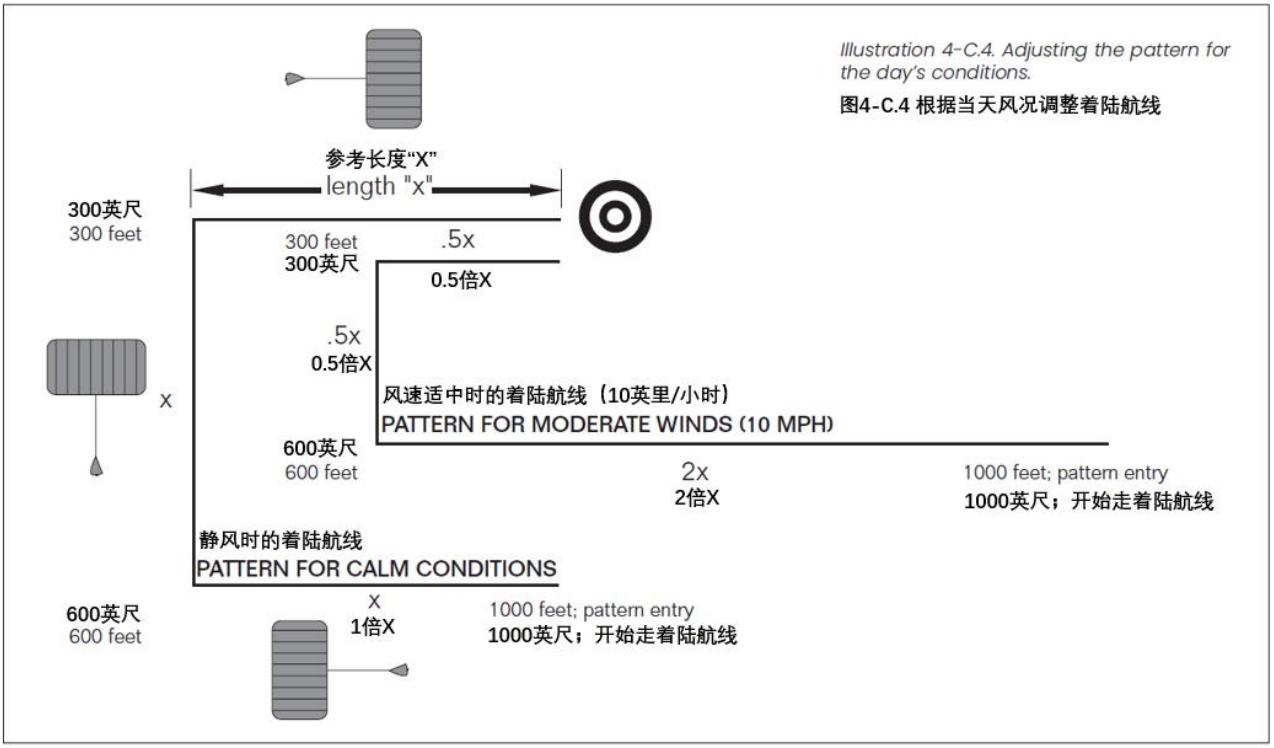
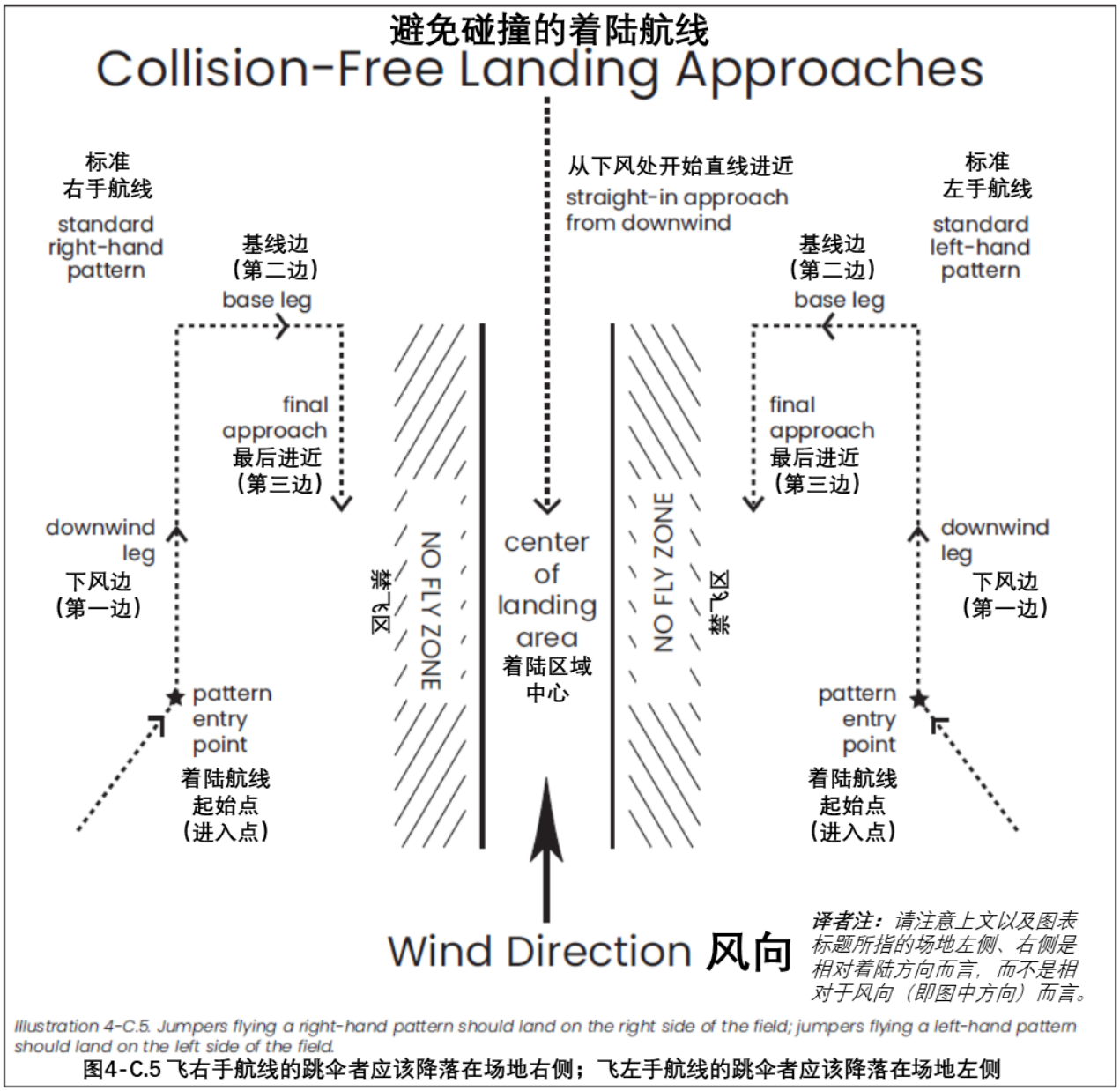


Illustration 4-C.4. Adjusting the pattern for the day's conditions.
图4-C.4 根据当天风况调整着陆航线



译者注：请注意上文以及图表标题所指的场地左侧、右侧是相对着陆方向而言，而不是相对于风向（即图中方向）而言。

Illustration 4-C.5. Jumpers flying a right-hand pattern should land on the right side of the field; jumpers flying a left-hand pattern should land on the left side of the field.

图4-C.5 飞右手航线的跳伞者应该降落在场地右侧；飞左手航线的跳伞者应该降落在场地左侧

dive flows「跳伞流程」

CATEGORY C FREEFALL DIVE FLOWS「C 单元自由落体流程」

AFF「AFF」

- Exit in a relaxed arch.「在放松的弓形姿态中出舱。」
- Circle of Awareness.「高度意识（看高度）。」
- Practice deployment(s) until smooth and without assistance.「练习模拟开伞直到动作流畅且不需要协助。」
- Circle of Awareness.「高度意识（看高度）。」
- Instructor(s) release grips as situation allows.「如果情况允许的话，教练可松手。」
- Altitude, arch, legs, relax。「高度、弓形、控腿、放松。」
- Instructor(s) make sure of student control by 6,000 feet or re-grip through deployment.
  「教练确保学生能在下落至 6000 英尺前做好控制，否则教练在学生开伞过程全程重新抓住学生。」
- Wave-off at 5,500 feet and deploy by 4,000 feet.
  「在 5500 英尺高度挥手示意，并在 4000 英尺以上开伞。」

IAD AND STATIC-LINE DIVE PLAN #1: CLEAR AND PULL

「IAD 和 Static Line 计划 1：净空开伞」

- Exit on command with legs extended.「根据指令出舱，双腿伸展。」
- Initiate deployment sequence as practiced on prior jumps, regardless of stability.
  「无论稳定性如何，像之前跳伞时练习过一样，启动开伞流程。」
- Check canopy.「检查降落伞」

IAD AND STATIC-LINE DIVE PLAN #2: TEN-SECOND FREEFALL (TWO JUMPS)

「IAD 和 Static Line 计划 2：十秒自由落体（2 跳）」

- Exit with legs extended.「出舱并伸展双腿。」
- Relax into neutral.「放松，进入中性的姿势。」
- Maintain count to ten by thousands while checking altimeter.
  「在检查高度表的同时，持续计数，一直数到 1010（1001、1002、...1010）。」
- Wave-off at seven seconds or 4,500 feet and initiate deployment by ten seconds or 4,000 feet, regardless of stability.
  「在第 7 秒时或在 4500 英尺高度挥手示意，无论稳定性如何，第 10 秒或 4000 英尺高度启动开伞程序。」

CATEGORY C CANOPY DIVE FLOW「C 单元开伞后流程」

- Release brakes and address any routine opening problems.「释放刹车棒，解决常见开伞故障」。
- Look left, turn left.「向左看，再向左转」。
- Look right, turn right.「向右看，再向右转」
- Flare.「拉平」
- Check altitude, position, and traffic.「检查高度、位置、交通」
- Find the landing area and pattern entry point.「找到着陆区和着陆航线起始点」
- Divide the flight path by thousands of feet.「以千英尺为单位划分飞行路线」
- Identify suspect areas of turbulence.「辨别疑似有乱流的区域」
- Verify landing pattern and adjust as necessary.「确定着陆航线，如有需要，进行调整」
- Steer over correct portion of flight path until 1,000 feet.
  「沿着飞行航线的正确部分控制降落伞飞行，直至 1000 英尺高度」
- Follow planned pattern over landing area or alternate.「按照预先计划的航线着陆，或者进行备降」
- Flare to land and PLF.「拉平着陆，并执行 PLF」。

CATEGORY C INSTRUCTOR NOTES「C 单元教练注意事项」

- Following release by their AFF Instructors, AFF students who have not received turn training in Category B may encounter heading drift. These students should be taught to recognize a heading change, consider it acceptable, and to correct it using the "altitude, arch, legs, relax" procedure.

B 单元中没接受过转向培训的 AFF 学生可能会在 AFF 教练松手后发生朝向偏移。这些学生应该学会识别朝向的变化，接受朝向的变化，并通过"高度、弓形、控腿、放松"来纠正它。

- Students who were taught turn technique in Category B may add "correct turn" at the end of that sequence, placing emphasis on the other four, more important points. Relaxed stability must first be established for proper, relaxed control.

在 B 单元中接受过转向技巧培训的学生可以在动作的末尾加上刻意的正确转向动作，把注意力放在其他四个更重要的点。学生必须能先在放松状态下保持稳定，才能够进行正确、放松的控制。

- The instructor should advance students only according to the recommended progression during the rudimentary skills training in Categories A-D. Repetition of fewer basic skills improves success later.

在 A 至 D 单元基本技能培训期间，教练只能按照建议的进度让学生学习。反复练习较少的基本技能可以提高后面单元的成功率。

category c quiz「C 单元小测」

ADMINISTERED PRIOR TO CONDUCTING JUMPS IN THE NEXT CATEGORY「测试应在进入下一单元跳伞前进行」

Quiz answers are listed in Appendix B.「测验答案列在附录 B 中」

1. In flat and stable freefall at terminal velocity, how long does it take an average jumper to fall 1,000 feet?
   在稳定的腹飞自由落体中，以终端速度下落时，一名平均身材的跳伞者需要多长时间才能落下 1000 英尺？
2. What is the correct procedure for recovering from instability to the belly-to-earth position?
   从不稳定状态恢复到腹部朝下的姿态的正确流程是什么？
3. Which is better, to pull at the planned altitude or to fall lower to get stable before pulling?
   在计划的高度开伞，或为了恢复姿态稳定而继续下落，哪个选择更好？
4. What is the purpose of the wave-off before deployment?
   在开伞之前挥手示意的目的是什么？
5. What is the purpose of the parachute landing fall (PLF), and why is it important for skydivers?
   执行 PLF 着陆的目的是什么，为什么这对于跳伞者来说很重要？
6. What part of the landing pattern is most dangerous to skydivers?
   着陆航线的哪一部分对跳伞者来说是最危险的？
7. How do higher wind speeds affect the planned landing pattern as compared to the pattern plan for a calm day?
   与静风时的着陆航线相比，更高的风速对着陆航线的规划有什么影响？
8. In moderately strong winds, how far downwind of an obstacle would you expect to find turbulence?
   在中等风速的情况下，障碍物的下风处多远范围内预计会出现乱流？
9. What is the best procedure to use when flying your canopy in turbulent conditions?
   降落伞在飞行中遇到乱流时，最佳应对措施是什么？
10. What weather conditions and wind direction(s) are most likely to cause turbulence at your drop zone?
    在什么样的天气和风向条件下，跳伞基地最有可能出现乱流？
11. Why is it important to protect your parachute system operation handles when in and around the aircraft?
    为什么在机内和机外注意保护降落伞系统的各个操作把手很重要？
12. Describe the equipment pre-flight strategy to use before putting on your gear.
    描述穿上装备之前，装备的飞行前检查策略。
13. How does the three-ring main canopy release system disconnect the main parachute from the harness?
    三环释放系统如何将背带与主伞分开？
14. How do you know if a reserve parachute has been packed by an FAA rigger within the last 180 days?
    怎么知道备伞是否被联邦航空局认证的降落伞装备师在过去的 180 天内叠过？
15. How do you know the reserve container has not been opened since the FAA rigger last closed it?
    怎么知道自从降落伞装备师上次叠好备伞并关包后，备伞伞包没有被打开过？
16. If the surface winds are blowing from west to east, which direction will you face to fly the downwind leg of the landing pattern (instructor's illustration)?
    如果地面风是从西向东吹的，着陆航线的下风边（第一边）应朝哪个方向飞（参考教练的示意图）？
17. What is the wing loading of the parachute you will use on your next jump?
    进行下一次跳伞时，你要用的降落伞的翼载是多少？
18. Which canopy size (same model design) will exhibit quicker control response?
    哪个尺寸的降落伞（同型号）会对跳伞者的操作有更快的响应？
    a. 210-square feet with a 210-pound jumper (geared up)
       210 平方英尺的降落伞，带一个 210 磅的跳伞者（穿着装备）
    b. 170 square feet with a 170-pound jumper (geared up)
       170 平方英尺的降落伞，带一个 170 磅的跳伞者（穿着装备）
19. When is it OK to attempt a stand-up landing?

什么时候可以尝试站立着陆？

Visualization: Mind Over Body「视觉化（想象）：内心引导身体」

Did you know that done properly, visualizing what you're about to do can be as effective as practicing it for real? Studies show that the only part of an athlete's performance that visualization won't help is gaining the strength necessary to perform the task.
你知道吗，如果方法正确，通过想象要做的事情可以达到与真实练习一样的效果。研究表明，想象唯一不起作用的地方是获得任务所需的身体力量。

Exercise is hard, and skydiving is expensive, but visualization is cheap and easy. To begin, go where you can relax and where distractions won't affect you. (Potential distractions may be all around, but you can train your mind to tune them out.) Breathe rhythmically and slowly and recall or imagine a pleasant experience or moment where you are calm and very comfortable.
练习很难，跳伞也很贵，但是想象很便宜也很容易。首先，找一个能放松的，不易分心的地方。（潜在的使人分心的事可能无处不在，但学生可以训练自己的大脑去排除这些影响。）有节奏地缓慢呼吸，回忆或想象一个愉快的经历或时刻，回味那时的平静舒适的感觉。

Then, imagine your upcoming performance exactly as you want it to occur. Start from the beginning, which includes moving to the door of the aircraft, and imagine your actions through to the end. You should even visualize your descent under canopy.
然后，按照你希望发生的情况来想象你接下来要做的事情。从头开始，包括爬到舱门，想象所有的动作，一直到最后。你甚至可以想象开伞后降落伞的下降过程。

Visualize every detail: where you will place your hands and feet in the door, the cold air rushing in, the noise of the plane, the clean smell of the air, the feel of the aircraft metal on your hands, and everything you can associate with the upcoming experience.
视觉化每一个细节：手和脚放在舱门的什么位置，冷空气冲进来，飞机的噪音，空气的清新气味，手触摸飞机金属部件的感觉，以及与即将到来的体验相关的一切细节。

Imagine how you will move every part of your body during the count and exit and how you will feel as you fly away from the plane. Think of where you will position your hands, feet, head, and torso, particularly as you explore techniques for maneuvering in freefall. Visualize every move, including looking at the ground, checking your altimeter, and seeing your instructors.
可以想象一下，在做出舱信号和出舱的过程中，身体的每一部分将如何移动，跳离飞机时，会有什么感觉。想想手、脚、头和躯干的摆放位置，特别是在自由落体中探索动作控制技巧时。视觉化每一个动作，包括看地面、检查高度表、看教练。

Some athletes visualize the upcoming performance from their point of view, while others visualize as if they were watching themselves on TV from above or alongside.
一些运动员从第一人称角度来视觉化即将要做的事情，而另一些运动员的想象则类似于在电视中从上方或旁边看自己。

Visualize in slow motion or real time, but no faster. See your performance as one continuous flowing action, rather than as snapshots. As you visualize your actions, associate the motions by feigning the small movements with your hands or your legs with each action ("twitch") as you mentally rehearse the performance.
应以慢动作或实时的方式进行视觉化想象，而不能更快。将自己的表现视为一个连续的动作流，而不是快照。视觉化每个动作的过程中，在心里排练时，通过手脚的微小动作将要做的实际动作关联起来。

Leave yourself a few minutes to take in the sights and sounds on the way to altitude, but keep your performance first on your mind. The jumpers who succeed best all practice their routines on the climb to altitude, so you shouldn't feel out of place. Just look around at the others doing the same thing!
留给自己几分钟的时间，在乘飞机爬升的途中欣赏风景和声音，但要把动作任务放在第一位。最优秀的跳伞者都会在飞机爬升的过程中练习他们的动作，所以不应该感到尴尬。看看周围的人，他们都在做同样的事情！

At this stage of your training, your performance requires as much of your attention as any skydiver training for competition. Use these same visualization tips that help top athletes in skydiving and other sports to help you improve your performance and increase your overall satisfaction from each jump.
到了这个培训阶段，学生对自己表现的关注度，需要和任何跳伞者在比赛训练时需要倾注的关注度一样高。可使用这些使顶级运动员在跳伞和其他运动中受益的视觉化技巧，以帮助提升自身表现，并提高每一跳的整体满意度。

At this stage of your training, your performance requires as much of your attention as any skydiver training for competition.
到了这个培训阶段，学生对自己表现的关注度，需要和任何跳伞者在比赛训练时需要倾注的关注度一样高。

4-D D 单元Category D

INTRODUCTION「序言」

By now, you have learned to safely control freefall by keeping track of your altitude, focusing on a neutral body position—especially your hips and legs—and relaxing. In Category D, you'll learn to control heading by modifying the neutral position using your upper body to deflect air. You will want to demonstrate relatively effortless control of 90-, 180-, and 360-degree freefall turns before moving on to aerobatics, introduced in Category E.
到目前为止，学生已学会了通过跟踪高度变化、把注意力放在中性身体姿态（特别是髋部和腿部）并保持放松来安全地控制自由落体。在 D 单元中，学生会学习通过调整中性的身体姿态，使用上半身偏转气流来控制朝向。在 E 单元进行特技动作之前，学生需要能够相对轻松地进行 90 度、180 度和 360 度的自由落体转弯。

IAD and static-line students start this category with a 15-second freefall, using the altimeter. IAD and static-line students jump from progressively higher altitudes as they demonstrate control and awareness. On delays of 15 seconds or more, a USPA Instructor should accompany the student in freefall for observation and coaching.
IAD 和 Static Line 学生在本单元开始时会进行 15 秒的自由落体，并利用高度表估算自由落体时间。当学生能展示出控制力以及高度和姿态意识时，会从越来越高的高度开始跳伞。在出舱后 15 秒或更长时间再开伞的情况下，USPA 教练应陪同学生跳伞，以便观察和指导学生。

Under canopy, you'll explore rear-riser control, which opens new safety options and adds fun to the canopy ride. Before advancing, you should demonstrate the ability to return to the drop zone and steer a planned, recognizable landing pattern without assistance. To progress to Category E, you should also by now be able to flare and land with minimal assistance. And each student should have been able to stand up on landing by the end of this category.
开伞后，学生会探索使用后组提带控制，这将提供新的安全选项，并增加降落伞控制的乐趣。在进入下一单元之前，学生需要在无协助的情况下能够飞回跳伞基地降落区并按照预先计划的、易辨识的着陆航线飞行。为能晋级至 E 单元，学生还应该能够在尽量少协助的情况下拉平着陆。到本单元培训结束之前，每个学生都应能够进行站立着陆。

In Category C, you observed your instructor prepare and inspect your gear for the jump. Now, it's your turn. In Category D, you'll begin studying skydiving equipment in earnest to become responsible for your own pre-flight equipment checks. You'll read the owner's manual for the automatic activation device and learn how to operate one.
在 C 单元中，学生观察了教练在跳伞前如何替学生准备装备并检查装备。现在学生需要能独立这么做。在 D 单元中，学生开始认真学习跳伞装备知识，并负责自行执行飞行前的装备检查。学生将阅读 AAD 用户手册，并学会如何操作 AAD.

The USPA Instructor introduces some of the elements of spotting, which means choosing the correct exit point and guiding the pilot to it. You'll observe jump-run operations from the door.
USPA 教练会向学生初次讲解一些看点定位的要素，看点定位的意思是选择正确的出舱点并引导飞行员飞到那里。学生会在舱门处观察跳伞航线的操作。

Study assignments include the FAA requirements for cloud clearance and visibility, which you will need to memorize.
学习任务还包括联邦航空局对云层间距和能见度的要求。学生需要记住这些要求。

INSTRUCTOR: TRANSITION PROTOCOL「教练：转换规则」

AFF students transferring to the remainder of the IAD or static-line progression must first exit stable on an AFF jump without instructor contact or make a stable IAD or static-line jump with a practice deployment (BSRs).
转换至 IAD 或 Static Line 培训方法的剩余部分培训内容的 AFF 学生，必须能先在无需教练扶稳的情况下，在 AFF

培训方法的跳伞中稳定地出舱，或者进行一次稳定的 IAD 或 Static Line 跳伞，包括完成模拟开伞（基本安全要求）。

AFF「AFF」

- two jumps　2 跳

IAD/STATIC-LINE「IAD 或 Static Line」

- four jumps　4 跳

RECOMMENDED MINIMUM DEPLOYMENT「建议最低开伞高度」

- 4,000 feet
  4000 英尺

Category at a Glance「单元概览」

ADVANCEMENT CRITERIA「晋级标准」

EXIT AND FREEFALL「出舱和自由落体」

AFF STUDENTS「AFF 学生」

- stability within five seconds after an unassisted poised exit
  在没有协助的情况下，扒机身（扒舱门、把手等飞机外部结构）出舱，姿态在 5 秒内稳定下来

ALL STUDENTS「所有学生」

- cumulative four 90-degree turns, 20-degree tolerance
  累计进行四次 90 度转向，误差在 20 度以内
- cumulative two 180-degree and two 360-degree turns, 45-degree tolerance
  累计进行两次 180 度、两次 360 度转向，误差在 45 度以内

CANOPY「伞控」

- cumulative two 90-degree rear riser turns with brakes set
  在不释放刹车棒的情况下，累计完成两次 90 度后组提带转向
- cumulative two 90-degree rear riser turns with brakes released
  释放刹车棒后，累计完成两次 90 度后组提带转向
- one 180-degree rear riser turn, and one 360-degree rear riser turn with brakes released
  释放刹车棒后，完成一次 180 度后组提带转向、一次 360 度后组提带转向
- two rear riser flares above 2,000 feet
  在 2000 英尺以上两次使用后组提带进行拉平
- landing within 165 feet of the target with minimal assistance
  在尽量少协助的情况下，在着陆目标 165 英尺的范围内进行着陆

EQUIPMENT「装备」

- operate the AAD
  AAD 的操作

SPOTTING AND AIRCRAFT「看点定位和飞机」

- recognize and observe the airport and the spot from the aircraft door during jump run
  在跳伞航线上，识别并观察机场，在舱门处观察出舱点。

ORAL QUIZ「口试」

BOOK STUFF「参考资料」

- read and memorize the table on cloud clearance and visibility requirements in FAR 105.17 (SIM Section 9-1)
  阅读并背下 FAR 105.17 中关于云层间距和能见度要求的表格（SIM 9-1）
- review SIM Section 2-1.G.9 (BSRs) on daylight requirements for student jumps
  回顾 SIM 2-1.G.9（基本安全要求）关于一天中可以进行学生跳伞的时间段的要求
- study SIM Section 5-1.F to review building landing procedures
  学习 SIM 5-1.F，复习建筑物着陆程序
- study SIM Section 5-1.E on equipment malfunctions
  学习 SIM 5-1.E 关于装备故障的内容
- read the AAD owner's manual
  阅读 AAD 用户手册

- study SIM Section 5-3.G on AADs
  学习 SIM 5-3.G 关于自动激活装置（AAD）的内容

CATEGORY D: LEARNING AND PERFORMANCE OBJECTIVES「学习和能力表现目标」

- solo, unassisted exit (AFF students)「独立无协助的出舱（AFF 学生）」
- freefall turns「自由落体转向」
- freefall speeds and times (review)「复习自由落体速度和时间」
- rear riser control「后组提带控制」
- building landing review「复习建筑物着陆」
- AAD (owner's manual)「AAD（用户手册）」
- pre-jump equipment check「跳前装备检查」
- introduction to three-ring release operation「三环释放系统简介」
- cloud clearance and visibility「云层间距和能见度」
- observe jump run「观察跳伞航线」

A. EXIT AND FREEFALL「出舱和自由落体」

1. AFF students: poised exit without assistance
   AFF 学生：在无协助的情况下扒机身出舱
   Note: Instructor grips are optional, based on previous performance.
   注：根据学生此前的表现，教练可选择是否抓稳学生。
   a. Use the same climbout, set-up, launch, and flyaway procedure as on previous exits.
      使用与以前一样的离机程序：爬出舱、准备就位、跳出、飞离。
   b. Prepare for slightly different results without an instructor gripping the harness on exit.
      如果出舱时教练不抓稳学生的背带，那么应为稍有不同的出舱效果做准备。
   c. Altitude, arch, legs, relax.
      高度、弓形、控腿、放松。
   d. Review Category C freefall stability recovery and maintenance procedures (AIR, ROB, Five-Second rule, etc.)
      回顾 C 单元中关于自由落体中如何恢复和保持稳定性的程序（AIR – "Altitude aware, In control, and Relaxed"、ROB – "Roll Out of Bed"、五秒规则等)。
   e. Exit without assistance and establish control within five seconds before advancing from Category D.
      进入下一单元之前，需能在无协助的情况下出舱，并在出舱后 5 秒内控制好姿态。
2. Initiating freefall turns
   自由落体转向的启动
   a. First establish a comfortable, relaxed, neutral body position.
      首先，采取舒适、放松、中性的身体姿势。
   b. Find a point ahead on the horizon as a primary heading reference (and also use the instructor).
      在前方地平线上找一个参考点作为方向参考（也可以把教练当作参考)。
   c. Initiate a turn by changing the level of your upper arms to deflect air to one side; the forearms should follow.
      通过改变上臂的水平姿态，让气流偏向一侧来启动转向；前臂跟随动作。
   d. Assist the turn's effectiveness by extending both legs slightly to counter the effects of tension in the upper body.
      可稍微伸展双腿以抵消上半身紧张状态的影响，提高转向的有效性。
   e. Any deviation from the neutral position (as when initiating a turn) demands more effort to maintain the rest of the body in neutral.
      任何偏离中性姿态的身体姿势（比如在启动转向时）都需要更努力地使身体的其余部分保持中性姿态。
   f. Maintain leg pressure and arch for a smooth turn.
      保持腿部压力和弓形姿态，以能够顺利转向。
   g. Stop small turns (90 degrees or less) by returning to the neutral body position.
      小角度转向（90 度或更小角度的转向）的停止，可通过让身体回到中性姿势来实现。
   h. Stop larger turns (180 and 360 degrees) using the "start-coast-stop" principle.

大角度转向（180 度和 360 度的转向）的停止，可遵循“启动、惯性、停止“原理。

(1) Start the turn using the turn position for the first half to three quarters of the turn.
在前 1/2 至 3/4 的转向中，采取转向姿势，以启动转向。

(2) Return to neutral (to coast) when the desired heading comes into view.
当目标方向出现在视野中时，回到中性身体姿态，靠惯性继续转向。

(3) Counter the turn if necessary to stop on heading.
如有需要，施加反向的转向，以在朝向正确方向时停下来。

i. To regain lost control: altitude, arch, legs, relax (neutral position), then pick a new heading to maintain.
如果失去控制，可使用“高度、弓形、控腿、放松”（中性的身体姿势）的技巧来恢复控制，然后选择新的朝向并保持。

j. Stop all maneuvers at 5,000 feet and maintain a stable arch on heading with positive leg pressure through wave-off and deployment.
在 5000 英尺高度停止所有动作，并且在挥手示意和开伞的过程中保持朝向、稳定的弓形，以及腿部压力。

3. Calculating freefall time according to exit altitude based on average terminal velocity of 120 mph:
根据出舱高度，按照 120 英里/小时的平均终端速度来计算自由落体的时间，如下：

a. ten seconds for the first 1,000 feet
出舱后的前 10 秒内约下落 1000 英尺

b. 5.5 seconds for each additional thousand feet (round down to five seconds for an added safety margin)
此后每 5.5 秒下落 1000 英尺（为增加安全裕度，可按 5 秒来计数）

c. example: jump from 5,000 feet with a planned deployment altitude of 3,000 feet—
示例：从 5000 英尺的高度跳下，计划的开伞高度是 3000 英尺—

(1) Allow ten seconds from 5,000 to 4,000 feet.
出舱后需要 10 秒才能从 5000 英尺下落到 4000 英尺。

(2) Add five seconds from 4,000 to 3,000 feet.
之后需要 5 秒才能从 4000 英尺下落到 3000 英尺。

(3) Plan a total of 15 seconds for freefall.
共规划 15 秒的自由落体时间。

B. CANOPY「伞控」

1. Rear riser steering
后组提带的控制

a. Steer using the rear risers with the brakes still set to change heading quickly after opening.
开伞后在不释放刹车棒的情况下，通过后组提带控制，可快速改变方向。

(1) With the brakes set, the canopy has less forward momentum to overcome for a turn.
在不释放刹车棒的情况下，降落伞在转向时需要克服的前进动量较小。

(2) The rear risers operate more than the entire back quarter of canopy.
后组提带可对降落伞的后部分的超过 1/4 的伞布进行操作。

b. Using risers to steer in case of a malfunctioned toggle (discussion)：
在刹车棒故障的情况下，可用组提带进行控制（讨论）：

(1) Release both brakes.
释放两个刹车棒。

(2) You need to conserve enough strength to complete all turns with rear risers until landing and still be able to flare.
应保留足够的力气，在降落前，全程使用后组提带完成所有转向，而且仍有力气拉平。

(3) Especially on a smaller canopy, you should practice riser flares many times above 2,000 feet on a routine jump before committing to a riser landing (important).
在尝试使用组提带进行着陆前，尤其是在使用小降落伞时，应先在平常的跳伞中，在 2000 英尺以上

高度多次练习使用组提带拉平（重要）。

(4) Your plan to land or cut away your canopy in the event of a malfunctioned toggle should be made before you ever encounter the problem.
在问题发生之前，就应已确定好遇到刹车棒故障时是切伞还是继续用这个伞降落的计划。

(5) One locked brake with the other released may necessitate a cutaway; decide and act by 2,500 feet.
在一个刹车棒锁定，而另一个刹车棒被释放的情况下，可能需要切伞；应在 2500 英尺以上做出决定并采取措施。

c. Practice all riser maneuvers above 2,000 feet and focus on the canopy pattern and traffic from 1,000 feet down, using a standard pattern for landing.
在 2000 英尺以上练习所有组提带机动，在 1000 英尺以下集中精力关注降落伞航线和空中交通，并使用标准着陆航线进行着陆。

d. Before making any turns, look in the direction of the turn to prevent collisions and entanglements.
在转向之前应先看向要转向的方向，以避免碰撞和缠绕。

2. With minimal assistance, land within 165 feet of the target before advancing from Category D.
进入下一单元之前，应能在尽量少协助的情况下，在距着陆目标 165 英尺的范围内着陆。

C. EMERGENCY PROCEDURE REVIEW「紧急程序回顾」

1. Training harness review (study Section 5-1.E of this manual)：
使用训练背带进行复习（学习本手册的 5-1.E）：

a. quicker recognition and decision-making ability for good or bad canopy (lower pull altitude)
能够更快地识别降落伞是否有问题，并快速做出正确决定（更低的开伞高度）

(1) Review sample problems not requiring a cutaway and practice the procedures.
回顾无需切伞的问题示例，并练习处理程序。

(2) Review premature deployment.
回顾意外过早开伞的处理。

(3) Review sample malfunctions requiring a cutaway and practice the procedures.
回顾需要切伞的故障示例，并练习处理程序。

b. procedures for testing a questionable canopy above cutaway altitude
在切伞高度以上，对怀疑能否正常工作的降落伞进行测试的程序

(1) Make two tries to clear the problem with toggles or back risers if altitude permits.
如果高度允许的话，尝试两次使用刹车棒或后组提带解决问题。

(2) The canopy must fly straight, turn, and flare reliably to be able to land safely.
降落伞必须能够可靠地沿直线飞行、可靠地转向、可靠地拉平，以安全降落。

(3) Decide to cut away or land the canopy by 2,500 feet and act.
在 2500 英尺以上决定是切伞还是继续用这个伞降落，并采取相应措施。

2. Procedures for landing on a building: Refer to the procedures in Section 5-1.F of this manual.
建筑物上着陆的程序：请参考本手册 5-1.F 的程序。

D. EQUIPMENT「装备」

1. Automatic activation device operation
自动激活装置（AAD）操作

a. The instructor or a rigger explains the basics of how to operate the AAD.
教练或降落伞装备师解释 AAD 的基本操作知识。

b. More AAD information is contained in the owner's manual, which every jumper should read.
有关 AAD 的更多信息请见用户手册。每个跳伞者都应阅读用户手册。

c. Refer to Section 5-3.G of this manual for more information on AADs.
请参考本手册 5-3.G 以了解有关 AAD 的更多信息。

2. Checking assembly of the three-ring release system:
检查三环释放系统的组装情况
Note: Disassembly and maintenance of the three-ring release is covered in Category H.
注：三环释放系统的拆卸和维护将在 H 单元中说明。
   a. Each ring passes through only one other ring.
   每个环只能穿过另一个环。
   b. The white retaining loop passes through only the topmost, smallest ring.
   白色固定绳只穿过（三个环中）最上面的最小的环。
   c. The white retaining loop passes through the cable housing terminal end.
   白色固定绳还应穿过切伞拉索收纳管末端的孔。
   d. The release cable passes through the loop.
   切伞拉索穿过该固定绳。
   e. The retaining loop is undamaged.
   固定绳应无磨损。
   f. The release cable is free of nicks, kinks, and burrs (especially on the end).
   切伞拉索不应有划痕、扭结或毛刺（特别在其末端）。
3. Pre-jump equipment checks「跳伞前装备检查」
Note: The instructor should guide you through a complete pre-flight equipment check using a written checklist.
注：教练应使用书面的检查清单来指导学生进行完整的飞行前装备检查。
   a. Before each jump, check your equipment before putting it on.
   每次跳伞前，穿上装备之前都需要检查装备。
   b. With the help of another jumper, get a complete equipment check with all your gear on before boarding
   穿好所有装备后，在登机前，在另一名跳伞者的协助下对所有装备进行全面检查
   c. Get your equipment checked once again before exiting the aircraft.
   在出舱前再次检查装备。
      (1) "check of threes" (jumper self-check)
      "三个三检查"（跳伞者自行检查）
         (i) three-ring assembly (and reserve static line)
         检查三环释放系统的组装（和 RSL）
         (ii) three points of harness attachment for snap assembly and correct routing and adjustment
         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
         (iii) three operation handles— main activation, cutaway, reserve
         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
      (2) pin check back of system (by another jumper) top to bottom
      从上到下，检查伞包背面（另一名跳伞者替你检查）
         (i) reserve pin in place (and automatic activation device on and set)
         备伞关包针到位（AAD 已开启，并且已设置好）
         (ii) main pin in place
         主伞关包针到位
         (iii) ripcord cable movement or correct bridle routing
         拉索能否移动，或引导伞系带的走线是否正确
         (iv) activation handle in place
         开伞把手位置正确
      (3) personal equipment check ("SHAGG")
      个人装备检查（"SHAGG"）
      Shoes「鞋子」—tied, no hooks「系好鞋带，鞋上没有会钩住东西的部件」
      Helmet「头盔」—fit and adjustment 「大小合适、调整到位」

Altimeter「高度表」—set for zero「调好零点」
Goggles「护目镜」—tight and clean「戴得紧、且护目镜干净清晰」
Gloves「手套」—lightweight and proper size「重量轻、尺寸合适」

4. Jumpsuit or clothes「连体服或衣服穿着规范」
   a. access to handles—shirt tails, jackets, and sweatshirts tucked in, pockets zipped closed
      穿上衣服后，手可以正常够到降落伞的各个把手—衬衫下摆，夹克和运动衫塞好，口袋拉链拉上
   b. protection on landing
      降落时可提供保护
   c. provide correct fall rate
      能提供正常的自由落体下降速率

E. RULES AND RECOMMENDATIONS「规则和建议」

1. Cloud clearance and visibility requirements for skydivers (FAR 105.17)
   对跳伞者的云层间距和能见度要求（FAR 105.17）
   a. Memorize the cloud clearance and visibility table in FAR 105.17 (or see illustration 4-D.1).
      背下 FAR 105.17 中的关于云层间距和能见度的表格（或参考示意图 4-D.1）。
   b. The FAA places the joint responsibility for cloud clearance and visibility on the jumper and the pilot.
      联邦航空局的规定，跳伞者和飞行员对遵守云层间距和能见度的要求负有共同责任。
2. USPA requires that all student jump operations be completed prior to sunset (BSRs).
   USPA 要求所有学生跳伞必须在日落前完成（基本安全要求）。

F. SPOTTING AND AIRCRAFT「看点定位和飞机」

1. Instructor-assisted planning with the landing pattern for the day's conditions
   在教练协助下根据当天的天气情况规划着陆航线
2. Overview of aircraft spotting and jump-run procedures (what "spotting" means):
   看点定位、跳伞航线程序的概览（知悉"看点定位"的含义）：
   Note: It is recommended that a jump pilot explain spotting procedures in Category E.
   注：建议跳伞作业飞行员在 E 单元中对看点定位程序进行讲解。
   a. determining the best opening point
      确定最佳的开伞点
      (1) calculations from wind forecasts
          根据风况预报进行计算
      (2) observation and discussion of previous jumpers' canopy descents
          观察并讨论不久前刚跳伞的跳伞者的伞降情况
   b. pre-flight briefing with the pilot to discuss the correct jump run and exit points
      与飞行员进行飞行前简报，讨论正确的跳伞航线和出舱点
   c. guiding the pilot on jump run
      在跳伞航线上引导飞行员
   d. verifying that the area below is clear of clouds and other aircraft before jumping
      跳伞前，应确认下方区域无云，且没有其他飞行器
3. During jump run, observe spotting procedures and demonstrate the technique for looking straight down from the aircraft.
   在跳伞航线上，观摩学习看点定位的程序，并学会如何看向飞机正下方。
   a. Sight from the horizon looking forward.
      往前方看，找一条从地平线延伸而来的直线
   b. Sight from the horizon looking abreast.
      往横向看，找另一条从地平线延伸而来的直线

c. The junction of the two perpendicular lines from the horizon marks the point straight below the aircraft.
两条直线的交点就是飞机正下方的地面位置。

4. You must get your head completely outside the aircraft to effectively look below for other aircraft and clouds.
必须把头完全伸出机外，才能够有效地观察到下面的云层和其他飞行器。

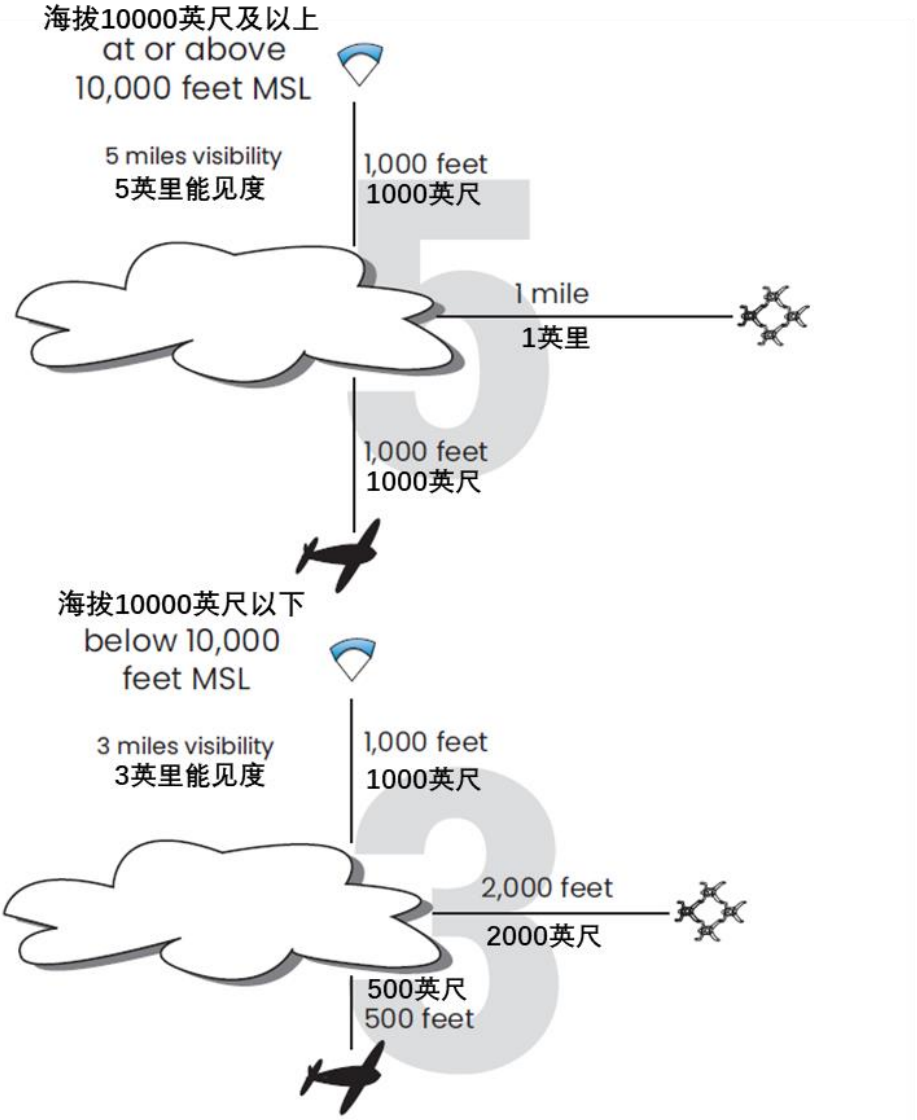


Illustration 4-D.1: Jumpers must observe the FAA requirements for visibility and clearance from clouds to avoid other aircraft flying over the drop zone.

图4-D.1 跳伞者必须遵守联邦航空局关于能见度和云层距离的要求，以避开其他在降落区上空飞行的飞行器

dive flows「跳伞流程」

CATEGORY D FREEFALL DIVE FLOWS「D 单元自由落体流程」

AFF DIVE PLAN #1: 90-DEGREE TURNS「AFF 计划 1：90 度转向」

- Observe spotting from the door.「从舱门处观摩学习看点定位。」
- Exit in a relaxed arch (grip optional).「在放松的弓形姿态中出舱（教练根据情况选择是否要抓住学生）。」
- Circle of Awareness.「高度意识（看高度）。」
- Practice pull(s) (optional).「模拟开伞练习（可选）。」
- Altitude, arch, legs, relax.「高度、弓形、控腿、放松。」
- Find a reference point on the horizon and determine the position of the instructor.
  「在地平线上找一个参考点，并确定教练的位置。」
- Ask permission to turn (head nod).「获得教练许可后进行转向（点头示意）。」
- Receive reply from instructor (head nod).「收到教练的回复（点头示意）。」
- Start a turn and stop at 90 degrees.「启动转向，转 90 度后停下来。」
- Altitude, arch, legs, relax.「高度、弓形、控腿、放松。」
- Perform (with instructor's permission each time) alternating 90-degree turns until 5,000 feet; initiate no turns below 6,000 feet.
  「执行 90 度交替转向（每次都需要得到教练允许），直到 5000 英尺高度；在 6000 英尺高度以下不得再启动转向。」
- Altitude, arch, legs, relax。「高度、弓形、控腿、放松。」
- Wave-off at 5,000 feet.「在 5000 英尺高度挥手示意。」
- Pull by 4,000 feet.「在 4000 英尺以上开伞。」

AFF DIVE PLAN #2: 180- AND 360-DEGREE TURNS「AFF 计划 2：180 度和 360 度转向」

- Observe spotting from the door.「从舱门处观摩学习看点定位。」
- Solo poised exit in a relaxed arch.「在放松的弓形姿态中独立扒机身出舱。」
- Circle of Awareness.「高度意识（看高度）。」
- Practice pull(s) (optional).「模拟开伞练习（可选）。」
- Altitude, arch, legs, relax。「高度、弓形、控腿、放松。」
- Find a reference point on the horizon and determine the position of the instructor.
  「在地平线上找一个参考点，并确定教练的位置。」
- Ask permission to turn (head nod).「获得教练许可后进行转向（点头示意）。」
- Receive reply from instructor (head nod).「收到教练的回复（点头示意）。」
- Start a turn and stop at 180 degrees.「启动转向，转 180 度后停下来。」
- Altitude, arch, legs, relax。「高度、弓形、控腿、放松。」
- If altitude permits, turn 180 degrees back to instructor.「如果高度允许的话，转 180 度回来对着教练。」
- Perform (with instructor's permission each time) alternating 360-degree turns until 5,000 feet; initiate no turns below 6,000 feet.
  「执行 360 度交替转向（每次都需要得到教练允许），直到 5000 英尺高度；在 6000 英尺高度以下不得再启动转向。」
- Altitude, arch, legs, relax.「高度、弓形、控腿、放松。」
- Wave-off at 5,000 feet.「在 5000 英尺高度挥手示意。」
- Pull by 4,000 feet.「在 4000 英尺以上开伞。」

IAD AND STATIC LINE:「IAD 和 Static Line 学生：」

90-, 180- and 360-Degree Turns
90 度、180 度和 360 度转向

Note: Recommended are two 15-second delays, two 30-second delays, and then longer delays until the cumulative four 90-degree, two 180-degree and two 360-degree turns required have been accomplished.
注：建议两跳出舱后 15 秒再开伞，两跳出舱后 30 秒再开伞，然后在后续跳伞中出舱后更长时间再开伞，直到累计完成所要求的四次 90 度、两次 180 度以及两次 360 度的转向。

- Observe spotting from the door.「从舱门处观摩学习看点定位。」
- Exit in a relaxed arch.「在放松的弓形姿态中出舱。」
- Awareness check (ground and altimeter).「高度意识检查（看地面和高度表）。」
- Practice pull (optional).「模拟开伞练习（可选）。」
- Altitude, arch, legs, relax.「高度、弓形、控腿、放松。」
- Find a point on ground 45-degrees ahead and below.「在下前方 45 度的地面上找一个参考点。」
- Start and stop a turn on a planned heading,「按计划的朝向，启动转向并停下。」
- 90 degrees (4)「90 度转向（4 次）」
- 180-degrees (2)「180 度转向（2 次）」
- 360-degrees (2)「360 度转向（2 次）」
- Between each turn: Altitude, arch, legs, relax.「每次转向之间：高度、弓形、控腿、放松。」
- Repeat turns in alternating directions until 5,000 feet.「重复交替改变转向方向，直到到达 5000 英尺高度。」
- Altitude, arch, legs, relax.「高度、弓形、控腿、放松。」
- Wave-off at 4,500 feet.「在 4500 英尺高度挥手示意。」
- Pull by 4,000 feet.「在 4000 英尺以上开伞。」

CATEGORY D CANOPY DIVE FLOWS「D 单元开伞后流程」

DIVE PLAN #1「计划 1」

- Correct minor canopy problems (line twist, slider, end cells) using rear risers with brakes set.
  「在不释放刹车棒的情况下，使用后组提带纠正降落伞出现的小问题（线缠绕、滑块布挂在上部、末端气室不完全充气）。」
- Look right, turn right 90 degrees using right rear riser.「向右看，再使用右边的后组提带向右转 90 度。」
- Check altitude, position, and traffic.「检查高度、位置、交通。」
- Repeat to the left.「向左转向，步骤同上。」
- Check altitude, position, and traffic.「检查高度、位置、交通。」
- Release brakes, conduct control check and move to the holding area
  「释放刹车棒，进行可控性检查，并飞到等待区。」
- Look right, turn right 90 degrees using rear risers.「向右看，再使用后组提带向右转 90 度。」
- Check altitude, position, and traffic.「检查高度、位置、交通。」
- Repeat to the left.「向左转向，步骤同上。」
- Look right, turn right 180 degrees using rear risers.「向右看，再使用后组提带向右转 180 度。」
- Check altitude, position, and traffic.「检查高度、位置、交通。」
- Repeat to the left.「向左转向，步骤同上。」
- Check altitude, position, and traffic.「检查高度、位置、交通。」
- Practice rear riser flares.「练习用后组提带拉平。」
- Return to normal controls for landing by 2,000 feet.「在 2000 英尺处恢复正常控制，以进行着陆。」

DIVE PLAN #2「计划 2」

- Clean up (line twist, slider, end cells) canopy with brakes set.
  「在不释放刹车棒的情况下，纠正降落伞可能出现的小问题（线缠绕、滑块布挂在上部、末端气室不完全充气）。」
- Look right, turn right 90 degrees using right rear riser.「向右看，再使用右边的后组提带向右转 90 度。」
- Check altitude, position, and traffic.「检查高度、位置、交通。」

- Repeat to the left.「向左转向，步骤同上。」
- Check altitude, position, and traffic.「检查高度、位置、交通。」
- Release brakes, conduct control check and move to the holding area
  「释放刹车棒，进行可控性检查，并朝等待区飞。」
- Look right, turn right 360 degrees using right rear riser.「向右看，再使用右后组提带向右转 360 度。」
- Check altitude, position, and traffic.「检查高度、位置、交通。」
- Repeat to the left.「向左转向，步骤同上。」
- Check altitude, position, and traffic.「检查高度、位置、交通。」
- Practice rear riser flares.「练习后组提带拉平。」
- Return to normal controls for landing by 2,000 feet.「在 2000 英尺处恢复正常控制，以进行着陆。」

category d quiz「D 单元小测」

ADMINISTERED PRIOR TO CONDUCTING JUMPS IN THE NEXT CATEGORY「测试应在进入下一单元跳伞前进行」

Quiz answers are listed in Appendix B.「测验答案列在附录 B 中」

1. For planned deployment initiation at 3,000 feet, approximately how long should an average-sized jumper fall after exiting at 5,000 feet?
   如果计划在 3000 英尺高度处开始开伞，那么在 5000 英尺高度出舱后，一名平均身材的跳伞者需要多长时间才能落到 3000 英尺高度？
2. What is the most appropriate response to loss of heading control in freefall?
   自由落体时如果失去方向控制，最合适的应对措施是什么？
3. What is the best way to avoid a canopy collision when turning?
   转向时避免与其他跳伞者发生碰撞的最佳方法是什么？
4. What is the quickest and safest way to change heading immediately after opening?
   开伞后立即改变方向的最快和最安全的方法是什么？
5. How would you steer a parachute that has a broken brake line?
   如果降落伞的刹车线断裂了，应怎么控制降落伞？
6. How would you prepare to land a canopy using the rear risers to flare?
   如果使用后组提带拉平降落的话，应该如何进行准备？
7. Describe your procedure for landing on a building
   描述在建筑物上着陆的程序。
8. What is the purpose of the automatic activation device?
   使用自动激活装置（AAD）的目的是什么？
9. Describe the “check of threes.”
   描述“三个三检查”。
10. What must the spotter do to determine what is directly underneath the aircraft while on jump run?
    在跳伞航线上，进行看点定位的跳伞者须做什么来确定飞机正下方的位置？
11. How far horizontally must jumpers be from any cloud?
    跳伞者与云层的水平距离应至少多远？
    a. below 10,000 feet MSL?
       在海拔 10000 英尺以下？
    b. 10,000 feet MSL and above?
       在海拔 10000 英尺及以上？
12. What are the minimum visibility requirements?
    能见度的最低要求是什么？
    a. below 10,000 feet MSL?
       在海拔 10000 英尺以下？
    b. 10,000 feet MSL and above?
       在海拔 10000 英尺及以上？
13. Who is responsible for a jumper observing cloud clearance requirements?
    谁负责确保跳伞者遵守云层间距要求？
14. According to the BSRs, what is the latest a student may jump?
    根据基本安全要求（BSR），学生最晚几点能跳伞？
15. Describe the technique for determining the point straight below the aircraft during jump run.
    描述在跳伞航线上如何确定飞机正下方的地面位置的技巧。
16. What must the jumper look for below before exiting the aircraft?
    跳伞者在出舱前，必须向下方观察什么？

Learning Spotting One Jump at a Time「在每次跳伞中学习看点定位」

Before earning a USPA A license, you are expected to learn to spot in routine conditions. "Spotting" simply means choosing the opening point and guiding the pilot to the correct position over the ground for exit. You can calculate the spot from a winds-aloft report. FAA Flight Service provides these reports, which you can get from the pilot.
在获得 USPA A 执照之前，你需要学会在常规条件下看点定位。简单地说，"看点定位"指选择开伞点并引导飞行员飞到正确的对应地面位置来让跳伞者出舱。你可以根据高空风况报告来计算点位，联邦航空局航班服务部可提供这些报告，也可以从飞行员那里得到这些信息。

When you're in the door before exit, spotting starts with determining exactly what's straight down and how the plane is moving across the ground. A good spotter's training never ends.
出舱前，在舱门处时，看点定位的第一步是看飞机正下方的地面位置，以及飞机相对地面的飞行轨迹。看点定位的练习提升是无止境的。

Here are some tips for beginners:
以下是一些给初学者的提示：

1. Be familiar with the DZ and surrounding area, including the correct exit and opening points for the day's conditions. The USPA Instructor will simply tell you at first and then show you how to figure it for yourself later.
建议跳伞者熟悉降落区及周边地区，包括适合当天情况的正确的出舱点和开伞点。USPA 教练首先会告诉你正确的出舱点和开伞点在哪里，然后向你展示如何独立确定这些点位。

2. Look out of the aircraft, obviously done best with the door open and your head all the way outside. Small aircraft give you more opportunities to practice spotting. In larger aircraft, your instructor will arrange some door time. First, just get comfortable looking out. Put your head all the way out into the windstream.
向飞机外看。最佳方法显然是舱门打开时把头完全伸出飞机外看。小型飞机让你有更多的机会练习看点定位。在大型飞机上，教练会安排一些从舱门处观察飞机外的时间。首先，要习惯把头伸出机外，把头一直伸出到气流中去。

3. Identify the DZ, the climbout point, and exit point from the open door of the aircraft. Point them out to your instructor or coach.
从打开的舱门处，找到降落区、舱门爬出点和出舱点。把这些点指给你的教练或初级教练看。

4. Look straight down, using horizon reference points. Avoid using the aircraft as a reference. On jump run, the plane is often climbing, banking, skidding, or crabbing.
使用地平线参考点往正下方看。避免使用飞机作为参考。在跳伞航线上，飞机经常在爬升、倾斜、滑行或侧滑。

5. Determine the track of the aircraft. Once you can identify two points straight below the plane on jump run, you know the actual path of the aircraft across the ground. If you see that it will take you too far to the left or right, suggest a correction to the one supervising your jump, who will relay your corrections to the pilot.
确定飞机的飞行轨迹。在跳伞航线上，一旦能识别出飞机经过的正下方的两个点，你就能知道飞机飞过地面的实际路径。如果你发现飞机会往左或往右飞太远，可以向监督你跳伞的人提出建议对此进行纠正，他会把你的建议转达给飞行员。

6. Allow enough time (distance) for your climbout and set-up to separate you from other jumpers. Learn when to climb out.
留出足够的时间（距离）爬出舱门和准备就位，以和其他跳伞者分开间隔。你应学会什么时候爬出舱门。

Soon, you'll give directions to the pilot under supervision. After a while, the USPA Instructor or Coach won't interfere unless your spotting appears unsafe.
很快，你就可以在受监督的情况下给飞行员发出指引。一段时间后，USPA 教练或初级教练不会再对此进行干涉，除非你看点确定的点位不安全。

Your spotting training will require several jumps, and the staff will log your progress. Spot as often as you can during your training as a student so you'll feel confident later when you're on your own.
你需要在多次跳伞中训练看点定位的能力，工作人员会记录你的进度。在培训过程中，作为一名学生，你要经常进行看点定位，这样当你独立跳伞时，才会胸有成竹。

When you're in the door before exit, spotting starts with determining exactly what's straight down and how the plane is moving across the ground. A good spotter's training never ends.
出舱前，在舱门处时，看点定位的第一步是看飞机正下方有什么，以及飞机相对地面的飞行轨迹。看点定位的练习提升是无止境的。

4-E E 单元 Category E

INTRODUCTION「序言」

This is the last category that distinguishes between students of different disciplines. Once you have demonstrated the ability to regain stability and control within five seconds after initiating a disorienting maneuver, a USPA Instructor in your discipline may clear you to jump without instructor supervision in freefall. At that point, any USPA Instructor may perform gripped exits with you, as well.
本单元是最后一个区分不同培训方法的单元。一旦学生能够展示他（她）有能力在故意扰乱姿态的动作之后 5 秒内仍能回到稳定和受控姿态，那么采用相应培训方法培训学生的 USPA 教练可以让学生在不受监督的情况下进行自由落体。到那时候，任意一位 USPA 教练都可被允许与学生做连接出舱。

From Category E on, a USPA Instructor makes sure you are properly trained and supervised on each jump.
从 E 单元开始，将由一名 USPA 教练负责确保学生受到适当培训，且每次跳伞都受到监督。

In Category E, you practice unpoised (door) exits and aerobatics to increase your confidence, awareness, and control in freefall. You should by now be jumping from the highest altitude available at your drop zone.
在 E 单元中，学生会练习舱门出舱（出舱时不扒机身外部结构）和特技动作，以增加学生在自由落体中的信心、高度和姿态意识，以及自由落体的控制力。到了现在，学生应从他（她）所在的跳伞基地可以跳下的最高高度跳伞。

Under canopy, you'll practice for softer landings by looking for the "sweet spot" in the flare—the flaring stroke that provides the best lift for that canopy with that jumper's weight. The goal is to flare your canopy to fly as flat as possible until you begin to touch down. The USPA Instructor will also remind you of your responsibility (and every jumper's responsibility) to observe and steer clear of other canopies.
在开伞后，学生会通过寻找拉平过程中的"甜点"来练习更轻的着陆。"甜点"是在当前的跳伞者的体重条件和降落伞型号和尺寸下，可提供最佳升力的拉平方式。目的是要让降落伞尽可能地平飞，直至跳伞者触地。USPA 教练也会提醒学生自身的责任（也是每位跳伞者的责任）—观察并避开其他降落伞。

By the end of Category D, you should have been able to land within 165 feet of the target with minimal assistance. In Category E, you should be able to do it on your own.
D 单元培训结束之前，学生应在尽量少协助的情况下，在着陆目标 165 英尺的范围内进行着陆。在 E 单元中，学生应有能力独立进行降落。

Part of the emergency procedure review includes a detailed discussion on preventing premature openings in freefall and more detailed procedures for two open canopies.
紧急程序回顾的部分内容包括关于自由落体时如何防止伞包过早意外打开的详细讨论，以及主伞和备伞同时打开时的详细处理程序。

A rigger or instructor will introduce you to the open parachute system to identify its key components, along with the FAA's rules for packing parachutes. Supervised packing begins in Category F.
降落伞装备师或教练会也让学生初次了解主伞展开后的降落伞系统，以辨别其关键组件，并讲解联邦航空局制定的叠伞规则。学生会从 F 单元开始进行受监督的叠伞。

You'll discuss weight, balance, airspeed, jump run procedures, and aircraft emergency procedures, usually with a jump pilot. A jump pilot or USPA Instructor also shows you how to read a winds-aloft report. From that information, you'll learn to calculate the best opening point over the ground.
学生还需要讨论重量、平衡、空速、跳伞航线程序和飞机紧急程序（通常与飞行员讨论）。飞行员或 USPA 教练也会

教学生如何看懂高空风报告。从这些信息中，学生要学习如何计算最佳开伞点对应的地面位置。

In Categories E through H, you're expected to select and prepare your equipment for jumping (with the supervising USPA Instructor's advice), including obtaining all recommended pre-jump equipment checks. You're also learning to spot, where to sit in the aircraft, and to allow enough distance between the jumpers exiting before you. You should know the surface winds and plan the appropriate landing pattern.
在 E 到 H 单元中，学生需要选择并准备好自己要用的跳伞装备（按照负责监督的 USPA 教练的建议），包括完成所有建议的跳伞前装备检查。学生也会学习如何看点定位，在飞机应上应坐在哪里，以及如何与早于自己出舱的跳伞者间隔开足够的距离。学生应了解地面风的情况，并规划适当的着陆航线。

In order to be cleared to student self-supervision by a USPA Instructor, you must have obtained the following skills and knowledge:
为了能够获得 USPA 教练的许可，以进入自我监督的跳伞阶段，学生必须具备以下技能和知识：

1. Demonstrated the ability to regain stability and control in freefall within five seconds after initiating a disorienting maneuver.
   能够展示他（她）有能力在自由落体中故意扰乱姿态的动作之后 5 秒内仍能回到稳定和受控姿态。
2. Demonstrated sufficient canopy control skills to land safely in all expected conditions.
   能够展示他（她）有足够的降落伞控制技能，并能确保在所有预期条件下都可安全地着陆。
3. Demonstrated the knowledge required to select and inspect gear before use.
   能够展示他（她）掌握了相关知识，能在使用装备前，选择好装备并检查装备。
4. Shown knowledge of spotting required to make reasonable judgment about suggested exit points,
   掌握了看点定位知识，能够对建议的出舱点进行合理的判断，
5. Shown knowledge of both normal and emergency aircraft procedures for all aircraft types in common use for skydiving.
   对跳伞者常用的所有飞机类型的正常程序和紧急程序有一定的了解。

ALL STUDENTS「所有学生」

- three jumps　3 跳

RECOMMENDED MINIMUM DEPLOYMENT「建议最低开伞高度」

- 4,000 feet
  4000 英尺

Category at a Glance「单元概览」

ADVANCEMENT CRITERIA「晋级标准」

EXIT AND FREEFALL「出舱和自由落体」

- cumulative two successive disorienting maneuvers with stability and altitude awareness recovered within five seconds
  累计连续两次故意扰乱姿态的动作之后 5 秒内仍能恢复稳定性和高度意识

Note: Once this requirement is met and you have received the endorsement of a USPA Instructor in your training discipline, your training may be supervised by any USPA Instructor. You may then self-supervise in freefall, but remain under USPA Instructor supervision. A USPA instructional rating holder should accompany you in the aircraft to verify the correct spot, clearance from clouds and aircraft, exit separation, and your position in the line-up.
注：一旦学生满足了上述要求，并且获得了持有其培训方法对应的教练评级的 USPA 教练的认可，就可以在后面的培训中由任意 USPA 教练进行监督。然后，学生就可以在自由落体中进行自我监督，但仍受 USPA 教练的监督。USPA 教学评级持有者应在飞机上陪同学生确认正确的点位、云层和其他飞行器的间距、出舱时的分开间隔，以及出舱顺序。

- cumulative one barrel roll, one back loop, and one front loop
  累计一次横滚，一次后空翻，一次前空翻
- one self-supervised freefall
  一次自我监督下的自由落体

CANOPY「伞控」

- unassisted landing within 165 feet
  在没有协助的情况下，在着陆目标 165 英尺的范围内进行着陆

EQUIPMENT「装备」

- complete open parachute system orientation
  了解主伞展开后的降落伞系统
- RSL orientation
  了解联动装置（RSL）

SPOTTING AND AIRCRAFT「看点定位和飞机」

- correct calculation of the opening point given simple wind conditions
  在简单风况下能够正确计算开伞点
- active participation with spotting procedures on jump run
  在跳伞航线上积极地参与看点定位

ORAL QUIZ「口试」

BOOK STUFF「参考资料」

- review BSRs on wind restrictions for students, SIM Section 2-1.H
  复习基本安全要求（BSR）中关于学生需要遵守的风速限制（SIM 2-1.H）
- read BSRs on oxygen requirements for jumps above 15,000 feet MSL, SIM Section 2-1.N; also FAR 91.211.A.3
  阅读基本安全要求（BSR）中关于在海拔 15000 英尺以上跳伞的氧气要求（SIM 2-1.N；也可参考 FAR 91.211.A.3）
- read and discuss USPA recommendations on dual ram-air deployments, SIM Section 5-1.E

阅读并讨论 SIM 5-1.E 中 USPA 对于两个冲压空气式降落伞被同时打开的情况的建议

- read and discuss USPA recommendations on reserve static lines in SIM Section 5-3.F
  阅读并讨论 SIM 5-3.F 中 USPA 关于联动装置（RSL）的建议
- read and discuss USPA recommendations on altimeters in SIM Section 5-3.J
  阅读并讨论 SIM 5-3.J 中 USPA 关于高度表的建议
- read and understand FAA Part 91 sections contained in SIM Section 9-1
  阅读并理解 SIM9-1 中联邦航空局规章制度第 91 部分各节内容
- read and discuss with an FAA rigger FAR 105.43.a and .b (SIM Section 9-1) on parachute packing and supervision requirements for packers

阅读 FAR 105.43.a 和 b（SIM 9-1）中关于叠伞的内容，以及关于叠伞员的监督要求的内容，并与联邦航空局认证的降落伞装备师进行讨论

CATEGORY E: LEARNING AND PERFORMANCE OBJECTIVES「学习和能力表现目标」

- door (unpoised) exit「舱门出舱（即出舱时不扒机身外部结构）」
- recovering stability and awareness「恢复稳定性和稳定意识」
- freefall aerobatics「自由落体特技」
- canopy stalls「降落伞失速」
- the canopy's "sweet spot"「降落伞的"甜点"」
- two canopies deployed (review)「两个降落伞（主伞和备伞）同时打开的情况（复习）」
- high-wind landings「大风着陆」
- RSL「联动装置（RSL）」
- open parachute orientation「了解展开的降落伞」
- parachute packing and supervision「降落伞的叠伞和叠伞监督」
- wind limits for students「风速限制」
- aircraft briefing「飞机简报」
- aircraft emergency procedures「机内紧急程序」
- selecting the opening point「选择开伞点」

A. EXIT AND FREEFALL「出舱和自由落体」

1. Stable door (unpoised) exit—
   稳定的舱门出舱（出舱时不扒机身外部结构）
   a. Position for the best launch.
      准备好最佳跳出姿势
   b. Present the front of your hips to the relative wind.
      髋的前部迎向相对气流
   c. Exit in a neutral position with your legs slightly extended (better stability).
      以中性身体姿态出舱，双腿稍微伸展（稳定性更好）。
   d. Maintain your arch as the relative wind changes from ahead to below after exit.
      出舱后，在相对气流由从飞机前进方向吹来转换至从下方吹来的过渡过程中需要保持弓形姿态。
2. Recovering from exit and freefall instability—
   从出舱后和自由落体中的不稳定状态恢复的步骤如下—
   a. Altitude, arch, legs, relax (review).
      高度、弓形、控腿、放松（复习）。
   b. If falling stable back-to-earth although arching, briefly retract one arm and look over that shoulder at the ground to return face-to-earth (half barrel roll).
      如果做了弓形，但还是一直以背部朝下的姿态下落，则可短暂收回一只手臂，视线越过这一侧的肩膀，看向地面，以恢复面朝对地面的姿态（半横滚）。
3. Barrel rolls, back loops, and front loops (instructor's preferred technique)
   横滚、后空翻、前空翻（看教练倾向哪个）
   a. Try barrel rolls first, because they have a built-in recovery component from back-to-earth.
      先尝试横滚，因为横滚动作的一部分能够被学生用来从背部朝下的姿态恢复。
   b. Any two disorienting maneuvers with recovery and reorientation within five seconds qualify you for self-supervision in freefall (the same one may be used twice).
      如果做出任何两次故意扰乱姿态的动作之后 5 秒内仍能回到稳定和受控姿态，学生就有资格在自由落体中进行自我监督（同样的动作可以两次使用）。
4. Rolls, loops and other freeflying maneuvers result in faster and erratic fall rates; check altitude often.
   横滚、空翻和其他自由飞动作会导致更快的且不稳定的下降速率；因此应经常检查高度。
5. Visual altimeters, especially when chest-mounted, may be unreliable during inverted positions (see SIM Section 5-3.J.4).

（目视读数的）高度表，尤其是戴在胸前的高度表，在背部朝下的姿态中读数可能不可靠（参考 SIM 5-3.J.4）。

B. CANOPY「伞控」

1. Types of stalls「失速类型」
   a. An aerodynamic stall is a stable, steady-state stall, or sink, with decreased glide and increased rate of descent.
   空气动力失速：一种稳定的、稳态的失速或下坠，降落伞的滑翔能力减弱，下降速率加快。
      (1) associated with older designs and specialized accuracy canopies
      较旧型号的降落伞和专门用于精准定点着陆的降落伞易发生空气动力失速
      (2) may not be achievable with newer, flatter-gliding canopies, which often fly flatter almost until a full stall
      较新的、滑翔轨迹较平的降落伞可能难以发生空气动力失速，这些降落伞在完全失速之前飞行轨迹通常是更平坦的
   b. A dynamic stall occurs at the end of a flare when the jumper begins to rock back under the canopy and the canopy begins to nose forward.
   动态失速：发生在拉平结束时，跳伞者的身体开始向后甩，降落伞伞布的前缘向前冲。
      (1) associated with a sharp dive
      急剧俯冲时可发生
      (2) may signal a full stall
      可能紧接着会完全失速
   c. A full stall occurs when the trailing edge (tail) is pulled below the leading edge (nose) and the canopy begins to fly backwards.
   完全失速：当降落伞伞布后缘（尾部）被拉到前缘（头部）下方，降落伞开始倒退飞行时，会发生完全失速。
      (1) collapses the canopy
      它会使降落伞伞布塌缩
      (2) may result in unrecoverable line twist in smaller, more highly loaded wings stalled with the toggles (a back-riser stall may be more controllable)
      在面积较小、翼载较高的降落伞上，因拉刹车棒而导致的完全失速可能会诱发无法恢复的线缠绕（后组提带操作导致的失速可能更可控）。
      (3) may be contrary to the manufacturer's recommendations
      可能与制造商的建议矛盾
      (4) may result in entanglement with the jumper if released too abruptly
      如果太突然地释放刹车棒或者后组提带，可能会导致降落伞与跳伞者缠绕在一起
      (5) may result in injury if done too low
      如果在太低的高度失速，可能会导致受伤
2. Raise the controls smoothly after any stall to avoid diving and partial collapse.
   在发生任何失速后，平稳地升起操作输入（刹车棒或后组提带），可避免降落伞俯冲和发生部分塌缩。
3. Proper flare technique:
   适当的拉平技巧：
   a. Keep your feet and knees together to maintain heading during the landing flare (level harness).
   保持双脚和膝盖并拢以在着陆拉平过程中保持方向（背带水平而不倾斜）。
   b. Flare with the hands in front to provide visual feedback for level control.
   拉下刹车棒时，双手应在身体前侧，这样可以很清楚看到两只手是否同步地、水平地拉下两个刹车棒。
4. Discovering the best landing flare ("sweet spot") for the canopy being jumped (nine practice flares)：
   探索当前使用的降落伞的最佳拉平方式（找"甜点"）（九次拉平练习）：
   Note: Complete all maneuvers above 1,000 feet.
   注：需要在 1000 英尺以上完成所有动作
   a. From full glide, flare to a mid-point in the toggle range.

从全速滑翔开始，拉平到刹车棒活动范围的中点。

(1) approximately the bottom of the rib cage
大约拉平至肋骨的底部

(2) at a medium rate of flare
以中等的速度拉平

b. Feel the amount and duration of lift before the stall.
在发生失速前，感受升力的大小和持续时间。

c. Return gently to full flight for at least ten seconds.
温和地恢复至全速飞行，并保持至少 10 秒钟。

d. Repeat to the same depth.
重复以相同的深度进行拉平。

(1) once at a faster rate
一次以更快的速度拉平

(2) once at a slower rate
一次以更慢的速度拉平

e. Compare the strength and duration of the lift before the stall.
比较发生失速前，升力的强度和持续时间。

f. Flare at three different speeds to a point deeper in the toggle stroke, approximately at the hips.
以三种不同的速度刹车拉平，把刹车棒拉到更低的位置，大约在髋部水平。

g. Flares at three different speeds to a higher point in the toggle stroke, approximately at the shoulders.
以三种不同的速度刹车拉平，把刹车棒拉到更高的位置，大约在肩膀水平。

h. Compare the flares to determine the stroke rate and depth that produces the maximum combined strength and duration of lift for that canopy.
比较不同的拉平方式，以确定在当前使用的降落伞型号和尺寸下，可以提供最大综合升力和最长持续时间升力的拉平速度和深度。

5. Best flare height above the ground
离地的最佳拉平高度

a. Use the best flare procedure (discovered during the nine practice flares) upon landing, beginning one body height above ground.
在着陆时采用最合适的拉平流程（可以在九次拉平练习时找到），从离地一个身高的高度处开始拉平。

b. Flare to minimum descent (or flat) and hold that toggle position when the glide begins to flatten.
拉平以使下降速度降到最低（或平飞），当滑翔轨迹开始变平时，保持该刹车棒位置。

c. Smoothly continue the toggle stroke to maintain the flat glide.
接着继续平稳拉下刹车棒以保持平坦的滑翔轨迹。

d. If the canopy begins to stall and drops several feet, begin the flare that much lower on the next jump.
如果降落伞开始失速并下落数英尺，则在下一次跳伞时应从低得多的高度开始拉平。

e. If you don't achieve the flattest glide before landing, begin to flare slightly higher on the next jump.
如果在着陆前没有达到最平坦的滑翔轨迹，那么在下一次跳伞时应从稍微高点的高度开始拉平。

6. Review of traffic avoidance procedures:
避开其他跳伞者的程序（复习）：

a. Watch for other traffic, especially upon entering the landing pattern.
注意其他空中交通，特别是在进入着陆航线时。

b. The most dangerous point of the pattern occurs when two jumpers on opposite base-leg approaches turn to final approach.
从基线边（第二边）到最后进近（第三边）的转向是着陆航线中最危险的部分，因为跳伞者可能遇到正对面接近的其他跳伞者。

c. The lower canopy has the right of way, but one jumper should not maneuver to assert right of way over

another.
高度更低的降落伞有优先通行权，但跳伞者不应通过故意采取一些动作来维护自己相对于另一名跳伞者的优先通行权。

d. It takes two people to have a collision, but only one to avoid it.
碰撞的发生涉及两方的参与，但只需要其中一个人做好避让，碰撞就可以避免。

C. EMERGENCY PROCEDURE REVIEW「紧急程序回顾」

1. Preventive measures for two open canopies
两个降落伞（主伞和备伞）同时打开的预防措施
   a. Deploy the main parachute at the correct altitude to avoid AAD activation.
   在正确的高度开主伞，以避免 AAD 激活。
   b. Initiate malfunction procedures high enough to cut away safely and avoid AAD activation.
   在足够的高度处启动故障处理程序以安全切伞，并避免 AAD 激活。
   c. Maintain and correctly operate hand-deployed pilot chutes, especially collapsibles.
   维护并正确操作手动释放的引导伞，特别是可缩引导伞。
   d. Protect your equipment before exit to prevent pins or handles being knocked loose.
   在出舱前保护好装备，以防止关包针或把手被撞松。
   e. Some AADs, particularly those used for student jumping, will activate under a fully open parachute when controlled too aggressively at lower altitudes.
   一些 AAD，特别是那些用于学生跳伞的 AAD，如果跳伞者在较低的高度操作降落伞进行激烈机动，就会在主伞完全打开的情况下下激活 AAD。
2. Review detailed procedures for two canopies out as they pertain to experienced jumpers, found in SIM Section 5-1.
复习在 SIM 5-1 中，有经验的跳伞者在两个降落伞同时打开时的详细处理程序。
3. Procedures for high-wind landings「大风着陆的程序」
   a. Before landing, disconnect the RSL as a precaution in case a cutaway becomes necessary to prevent being dragged.
   着陆前，断开 RSL，以防在需要切伞时被降落伞拖动。
   b. Choose a point to the side or well downwind of any obstacle that may generate turbulence.
   如有可能产生乱流的障碍物，则应在障碍物的侧面或下风处较远的位置着落。
   c. Land using a PLF and pull one toggle in as quickly as possible until the canopy collapses.
   执行 PLF 着陆，并尽可能快地拉下一边的刹车棒，直到降落伞塌缩。
   d. After landing, cut away if necessary (with an SOS, cutting away may open the reserve container, but only the reserve pilot chute will likely deploy).
   着陆后，如有需要，可切伞（使用单把手紧急系统（SOS）时，切伞可能会导致备伞伞包的打开，但最可能只有备伞引导伞会释放）。

D. EQUIPMENT「装备」

1. Attend the Category E Open Parachute Orientation (inset) to prepare for packing lessons.
参加 E 单元的关于主伞展开后的降落伞的培训（见本节后方），为叠伞课做好准备。
2. Typical characteristics of elliptical canopies, compared to rectangular canopies of the same size and material:与与相同尺寸和材质的矩形伞型相比，椭圆伞型的典型特征如下：
   a. flatter glide for same airspeed
   在相同的空速下，有更平坦的滑翔轨迹
   b. faster turns
   更快的转向
   c. greater loss of altitude in a turn

在转弯时更大的高度损失

d. may continue to dive after stopping control input following a turn
在转弯后停止控制输入后降落伞可能继续俯冲

e. slower, less predictable opening (some models)
更慢的，更难以预测的开伞（某些型号）

f. shorter toggle stroke for flare (some models)
刹车拉平时，所需的刹车棒行程更短（某些型号）

g. quicker, more abrupt stall (some models)
更快、更突然的失速（某些型号）

3. The stall speed of any wing increases with higher wing loading.
任何降落伞伞翼的失速速度都会随着翼载的增加而增加。

a. more suspended weight
悬挂的载荷更重

b. sudden maneuvers, such as flaring hard after a dive
俯冲后，进行突然的动作（如拉平）会很难

c. Use and limitations of the reserve static line, or RSL (SIM 5-3).
RSL 的使用和局限（SIM 5-3）。

E. RULES AND RECOMMENDATIONS「规则和建议」

1. Winds「风」

a. Students are limited to 14 mph (ten mph for round reserves).
学生可以跳伞的风速上限是 14 英里/小时（圆形备伞的上限是 10 英里/小时）。

b. A USPA S&TA may file a waiver for students to jump in higher winds (see Section 2-2 on waivers to the BSRs, for the procedure).
USPA 安全和培训顾问可以为学生在更高的风速中跳伞做出豁免申请（豁免程序请参考本书 2-2 节关于基本安全要求的豁免的部分）。

c. Licensed jumpers must exercise judgment.
有执照的跳伞者须按情况作出判断。

2. The FAA publishes rules for the periodic inspection and repacking of the main and reserve parachute system, found in FAR 105.43.a and b (SIM 9-1).
联邦航空局公布了关于定期检查主伞和备伞，以及主伞和备伞系统重新叠伞的规则，请参考 FAR 105.43.a 和 b（SIM 9-1）。

F. SPOTTING AND AIRCRAFT「看点定位和飞机」

1. Attend the Aircraft Briefing (inset).
参加飞机简报（见本节后方）。

2. Spotting (pilot or instructor)
看点定位（飞行员或教练）

a. how to read a winds-aloft report「如何阅读高空风报告」

b. true v. magnetic heading「真航向与磁航向的区别」

c. jump-run procedures「跳伞航线程序」

d. spotting corrections「看点定位的纠正」

(1) manual (hand signals, shoulder taps)「以手动方式沟通（做手势、拍肩）」

(2) electronic (spotting buttons and lights)「用电子设备沟通（看点定位按钮和指示灯）」

(3) verbal「口头沟通」

3. The effect of winds during canopy descent
风对降落伞下降过程的影响

a. A canopy descends at approximately 1,000 feet per minute.
降落伞以每分钟约 1000 英尺的速度下降。

b. Divide the opening altitude by 1,000 feet to determine time of descent, e.g., 3,000 feet = three minutes of descent.
将开伞高度除以 1000 英尺，以确定降落伞的下降时间，例如 3000 英尺=3 分钟的下降时间。

c. Estimate in miles per minute the amount of drift during descent, as in Table 4-E.1:
以英里/分钟为单位预估降落伞下降过程中的漂移量，如表 4-E.1 所示：

MPH **英里/小时**	**MILES PER MINUTE** **英里/分钟**	**DRIFT FROM 3,000FEET** **从 3000 英尺开始的漂移**
60	1	-
30	1/2	-
20	1/3	1 英里
15	1/4	3/4 英里
10	1/6	1/2 英里
5	1/12	1/4 英里

Table 4-E.1. Convert miles per hour to miles per minute and multiply times three minutes (approximately 1,000 feet of descent per minute) to estimate drift under canopy.

表 4-E.1 将风速的单位“英里/小时”转换为“英里/分钟”，然后乘以 3（分钟）（大约每分钟下降 1000 英尺）来预估开伞后因风导致的降落伞漂移量。

4. Calculate the drift under canopy from 3,000 feet, based on the average of the known winds and a canopy descent rate of 1,000 feet per minute, to choose the correct opening point—example (Table 4-E.2):
示例（表 4-E.2）：根据已知的风的平均速度和每分钟 1000 英尺的下降速率来计算从 3000 英尺开始的降落伞漂移量，以选择正确的开伞点：

   a. canopy descent time from 3,000 feet (at 1,000 feet per minute): three minutes
   从 3000 英尺开始的降落伞下降时间（假设下降速率为 1000 英尺/分钟）：3 分钟

   b. total (uncontrolled) drift at 1/4 mile per minute: 3/4 mile
   以每分钟 1/4 英里的漂移速度计算总漂移量（在不对降落伞进行控制的条件下）：3/4 英里

   c. ideal opening point: 3/4 mile due west
   则理想的开伞点为：正西 3/4 英里

WINDS (FORECAST AND OBSERVED) 风况（预测和观测数据）		
Altitude 高度	**Direction 风向**	**Speed 风速**
3000 英尺（AGL*）	280 度	20
Surface 地面	260 度	10
Average 平均	270 度	15

Use Table 4-E.1 above to estimate the canopy's drift during a three-minute descent in winds averaging 15 mph. under canopy.
可参照表 4-E.1，计算降落伞在平均风速 15 英里/小时的情况下，下降 3 分钟的过程中风造成的漂移量。
**AGL：Above Ground Level 的缩写，指离地高度*

DRIFT 漂移量			
Open 开伞后高度	**Time 降落伞下降时间**	**Distance 漂移距离**	**Direction 漂移方向**
3000 英尺	3 分钟（乘 1/4）	3/4 英里	从 270 度（向 90 度漂移）

Table 4-E.2: Average the wind direction and velocity to estimate drift after opening at 3,000 feet above the ground
表 4-E.2：计算平均风向和风速，以估计在离地高度 3000 英尺处开伞后，降落伞在下降过程中的漂移量。

5. Observe and ask jumpers on a previous load about the wind conditions and spot.
   观察不久前刚跳伞的跳伞者的情况，并询问他们关于风况和看点定位的情况。
6. Jumper procedures during jump run
   在跳伞航线上跳伞者的程序如下：
   a. The pilot determines when the door may be opened and may prefer to operate the door.
      飞行员决定什么时候可以打开舱门，并可能会倾向于自己控制舱门。
   b. Look below to—
      看向下方，以—
      (1) check for clouds「检查云层」
      (2) check for aircraft「检查其他飞行器」
      (3) verify the jump run is correct「确认跳伞航线是否正确」
   c. When the pilot gives the OK to jump, verify that the aircraft is the desired distance from the drop zone and begin exit procedures.
      当飞行员给出可以跳伞的信号时，确认飞机与跳伞基地的距离是否符合要求，并开始出舱程序。
7. Be sure to establish communications for spotting corrections with the pilot prior to flight.
   请注意，飞行前一定要与飞行员确认纠正点位的沟通方式。

ALTERNATE METHOD FOR CALCULATING FREEFALL AND CANOPY DRIFT
计算自由落体漂移量和降落伞漂移量的替代方法

EXAMPLE FOR CALCULATING FREEFALL DRIFT
自由落体漂移量计算示例

Altitude 高度	Heading 风的去向	Speed(mph) 风速（英里/小时）
3000 英尺	250 度	15 英里/小时
6000 英尺	260 度	18 英里/小时
9000 英尺	280 度	22 英里/小时
12000 英尺	290 度	25 英里/小时
Average 平均	270 度	20 英里/小时

To simplify the process, convert mph to mile per minute (mpm)
为了简化过程，将"英里/小时"转换为"英里/分钟"。
**Assuming a one minute freefall, 20 divided by 60 equals .33 miles. Freefall drift is equal to .33 miles at 270 degrees.*
**风速 20（英里/小时）除以 60（分钟/小时）等于 1/3（英里/分钟）。*
假设自由落体 1 分钟，则自由落体漂移量为 1/3 英里，方向为朝向 270 度。
（译者注：此算例之所以被称作"替代方法"，是因为风的表示由"Direction"，即风的来源方向（风向一般默认以来源方向表示），改为了"Heading"，即风的去向，使得漂移量的计算结果更为直观，无需反转 180 度进行转换）

EXAMPLE FOR CALCULATING CANOPY DRIFT
降落伞漂移量计算示例

Altitude 高度	Heading 风的去向	Speed(mph) 风速（英里/小时）
Surface 地面	180 度	12 英里/小时
3000 英尺	200 度	18 英里/小时
Average 平均	190 度	15 英里/小时

To simplify the process, convert mph to mile per minute (mpm)
为了简化过程，将"英里/小时"转换为"英里/分钟"。
**Assuming a four-minute canopy flight, 15 divided by 60 is equal to .25 miles. Canopy drift is equal to .25 miles multiplied by four minutes which is equal to one mile at 190 degrees.*
**风速 15（英里/小时）除以 60（分钟/小时）等于 1/4（英里/分钟）。假设降落伞飞行 4 分钟，则降落伞漂移量为 1/4（英里/分钟）乘以 4（分钟），即 1 英里，方向为朝向 190 度。*

AIRCRAFT BRIEFING「飞机简报」

The following briefing for Category E students covers the interaction between the jumpers, the aircraft, and the pilots:
以下对 E 单元学生进行的简报内容涉及跳伞者、飞机和飞行员之间的互动：

1. Sufficient airspeed is necessary for flight; without it, the aircraft wing stalls.
   足够的空速是飞机飞行的必要条件；没有足够的空速，飞机的机翼就会失速。
2. Weight「重量」

a. Aircraft weight limits are specified in the aircraft owner's manual and other documentation and, by law, may not be exceeded.
飞机重量限制可在飞机用户手册和其他文件中找到，根据法律规定，飞机载荷不得超过重量限制。

b. Weight includes:「飞机的重量包括：」
(1) fuel「燃料」
(2) occupants「乘客」
(3) skydiving equipment「跳伞装备」
(4) other (jump seats, oxygen systems, etc.)「其他（跳伞者座椅、氧气系统等）」

c. The weight must be calculated for each load.
每次跳伞必都须计算载荷的重量。

3. Weight distribution (center of gravity)「重量分布（重心）」
a. The load in an aircraft must be distributed within center of gravity limits to fly.
飞机上的载荷必须分布在重心限制范围内，飞机才能飞行。

b. Limits are published in the owner's manual and other documentation.
重心限制可在飞机用户手册和其他文件中找到。

c. The pilot must calculate and monitor weight distribution for each flight.
飞行员必须计算并监测每次飞行的重量分布。

d. Jumpers moving around the aircraft can place the load out of limits.
在飞机上移动的跳伞者可能会使载荷超出重心限制范围。
(1) In aircraft with a door in the rear, some jumpers must remain forward as groups congregate near the door.
如果舱门在飞机的后部，当一群人聚集在舱门附近时，一些跳伞者必须留在飞机前部。
(2) Large groups planning to exit together should inform the pilot.
一大组跳伞者计划一起出舱时，应先通知飞行员。

4. Seat belts—「安全带」
a. prevent injuries in an emergency
可在紧急情况下防止受伤

b. maintain the load within the center- of-gravity limits
可使载荷保持在重心限制范围内

5. Jumpers outside the aircraft—
扒在飞机外的跳伞者—
a. can block air flow to the control surfaces
可能会阻碍气流正常流过飞机的控制面（*译者注：如尾翼升降舵*）

b. add drag that makes it harder to maintain the necessary airspeed
会增加飞机的飞行阻力，使保持必要的空速变得更加困难

c. When floaters (outside the aircraft) are out, jumpers must exit quickly to reduce the effect of drag.
当舱外离机者处在飞机外部时，跳伞者必须迅速出舱，以减少其产生的阻力的影响。

6. Apply the concept of weight, balance, and drag to aircraft at the DZ.
将重量、平衡和阻力的概念应用到跳伞基地的飞机上。

7. Aircraft emergency procedures
机内紧急程序

8. Discussion on the sections of FAR 91 provided in this manual (Section 9-1); only the sections pertinent to skydiving are included there.
讨论本手册中（9-1）提供的 FAR 91 相关内容；那里仅收录了与跳伞有关的章节规定。

OPEN PARACHUTE ORIENTATION「了解主伞展开后的降落伞」

A rigger or instructor introduces you to the parachute system when it is unpacked. You will learn the common points of

parachute wear and maintenance requirements during Category G. Assembly and maintenance of the three-ring release is covered in Category H.

降落伞装备师或教练会向学生介绍主伞未叠时的降落伞系统。在 G 单元中，学生会了解降落伞的磨损以及相应的维护要求。H 单元则会讲解三环释放系统的组装和维护。

1. Packing is a function of identifying and organizing the parachute.
   叠伞有助于学生辨识和整理降落伞。
2. Identify「辨识降落伞的各部件」:
   a. pilot chute, bridle, and collapsing system「引导伞、引导伞系带、可缩引导伞系统」
   b. deployment bag or other device「D 包和其他设备」
   c. pilot chute attachment「引导伞连接处」
   d. top skin and discuss the different characteristics of F-111 (0-3 cfm) and zero-P fabric
      降落伞伞布上表面，讨论 F-111（0-3 立方英尺/分钟）材质和 ZP 材质的不同特点
      （译者注：1. “立方英尺/分钟”为衡量织物透气性的单位；2. ZP—即 zero-P 或 Zero Porosity 的缩写，指织物的孔隙率。）
   e. packing tabs「叠伞辅助布条」
   f. bottom skin「降落伞伞布下表面」
   g. leading edge (nose)「降落伞伞布前缘（头部）」
   h. trailing edge (tail)「降落伞伞布后缘（尾部）」
   i. center of tail (warning label or tab)「降落伞伞布的伞尾中间处（警告布）」
   j. stabilizers「稳定翼」
   k. manufacturer’s label or logo (to identify end cell) 「制造商的标签或标识（用于辨别末端气室）」
   l. slider stops「滑块布限位器」
   m. loaded and unloaded ribs「承受载荷和非承受载荷的伞肋」
   n. crossports「气室间的通风切口」
   o. A, B, C, D, and brake lines「A、B、C、D 线和刹车线」
   p. 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」
   q. slider and slider grommets 「滑块布和滑块布的孔环」
   r. connector links and link protectors「（伞绳和组提带的）连接器和连接器保护套」
   s. risers and brake system「组提带和刹车棒系统」
3. Review and discuss (preferably with an FAA rigger) FAR Part 105.43.a and b (Section 9-1 of this manual).
   回顾并讨论（最好是与联邦航空局认证的降落伞装备师一起）FAR 105.43.a 和 b 部分（本手册 9-1）。
   a. who may pack a main parachute
      谁有资格叠主伞
   b. how often it needs to be packed
      主伞需要多长时间叠一次
   c. rigger supervision of non-rated packers
      降落伞装备师监督未获评级的叠伞员进行叠伞的相关规定

dive flows「跳伞流程」

CATEGORY E FREEFALL DIVE FLOWS「E 单元自由落体流程」

DIVE PLAN #1: BARREL ROLL AND RECOVERY「计划 1：横滚和恢复」

- Assist with spot.「在协助下进行看点定位。」
- Solo, ungripped exit.「独立的，无需教练抓稳的出舱。」
- Altitude, arch, legs, relax.「高度、弓形、控腿、放松。」
- Barrel roll.「横滚。」
- Altitude, arch, legs, relax.「高度、弓形、控腿、放松。」
- Barrel roll (or other disorienting maneuver).「横滚（或其他故意扰乱姿态的动作）。」
- Altitude, arch, legs, relax.「高度、弓形、控腿、放松。」
- Continue aerobatics until 6,000 feet.「持续做特技动作，直到 6000 英尺。」
- Altitude, arch, legs, relax between each maneuver.「每次动作之间使用“高度、弓形、控腿、放松”的技巧。」
- Wave-off at 4,500 feet.「在 4500 英尺高度挥手示意。」
- Pull by 4,000 feet.「在 4000 英尺以上开伞。」

DIVE PLAN #2: FRONT LOOPS AND BACK LOOPS「计划 2：前空翻、后空翻」

- Assist with spot.「在协助下进行看点定位。」
- Optional exit.「自选出舱方式。」
- Altitude, arch, legs, relax.「高度、弓形、控腿、放松。」
- Perform required aerobatics to standards until 6,000 feet.「按照标准要求做所需的特技动作，直到 6000 英尺。」
- Altitude check between each maneuver.「每次动作之间检查高度。」
- Wave-off at 4,500 feet.「在 4500 英尺高度挥手示意。」
- Pull by 4,000 feet.「在 4000 英尺以上开伞。」

CATEGORY E CANOPY DIVE FLOW「E 单元开伞后流程」

- Check altitude, position, and traffic.「检查高度、位置、交通。」
- Flare to chest at a medium speed and hold.「以中等速度拉平到胸部位置并保持。」
- Recover to full flight for ten seconds.「恢复到全速飞行，并保持 10 秒钟。」
- Check altitude, position, and traffic.「检查高度、位置、交通。」
- Flare to chest at a quicker speed and hold.「以更快的速度拉平到胸部位置并保持。」
- Recover to full flight for ten seconds.「恢复到全速飞行，并保持 10 秒钟。」
- Check altitude, position, and traffic.「检查高度、位置、交通。」
- Flare to chest at a slower speed and hold. 「以较慢的速度拉平到胸部位置并保持。」
- Recover to full flight for ten seconds.「恢复到全速飞行，并保持 10 秒钟。」
- Check altitude, position, and traffic.「检查高度、位置、交通。」
- Flare to hips at a medium speed and hold.「以中等速度拉平到髋部位置并保持。」
- Recover to full flight for ten seconds.「恢复到全速飞行，并保持 10 秒钟。」
- Check altitude, position, and traffic.「检查高度、位置、交通。」
- Flare to hips at a quicker speed and hold.「以更快的速度拉平到髋部位置并保持。」
- Recover to full flight for ten seconds.「恢复到全速飞行，并保持 10 秒钟。」
- Check altitude, position, and traffic.「检查高度、位置、交通。」
- Flare to hips at a slower speed and hold.「以较慢的速度拉平到髋部位置并保持。」
- Recover to full flight for ten seconds.「恢复到全速飞行，并保持 10 秒钟。」
- Check altitude, position, and traffic.「检查高度、位置、交通。」
- Flare to shoulders at a medium speed and hold.「以中等速度拉平到肩部位置并保持。」
- Recover to full flight for ten seconds.「恢复到全速飞行，并保持 10 秒钟。」

- Check altitude, position, and traffic.「检查高度、位置、交通。」
- Flare to shoulders at a quicker speed and hold.「以更快的速度拉平到肩部位置并保持。」
- Recover to full flight for ten seconds.「恢复到全速飞行，并保持 10 秒钟。」
- Check altitude, position, and traffic.「检查高度、位置、交通。」
- Flare to shoulders at a slower speed and hold.「以较慢的速度拉平到肩部位置并保持。」
- Recover to full flight for ten seconds.「恢复到全速飞行，并保持 10 秒钟。」
- Evaluate the most effective flare according to the strongest sustainable lift ("sweet spot").
  「以最强有力的、持续时间最长的升力（"甜点"）为判断标准，评估哪种拉平方式最有效。」
- Initiate the best flare at head height above the ground.
  「在离地一个身高的高度时，开始用最佳的拉平方式进行拉平。」
- Continue to flare to maintain a flat glide until landing.「继续拉平，以保持平坦的滑翔轨迹，直到着陆。」
- Evaluate the flare height according to the landing results.「根据着陆效果来判断合适的拉平高度。」

CATEGORY E EQUIPMENT「E 单元装备」

- Open Parachute Orientation「了解主伞展开后的降落伞系统」

CATEGORY E SPOTTING AND AIRCRAFT「E 单元看点定位和飞机」

- Aircraft Briefing「飞机简报」

CATEGORY E INSTRUCTOR NOTES:「E 单元教练注意事项：」

- Each student should complete the equipment, spotting, and aircraft procedures training before advancing to Category F.
  学生在进入 F 单元之前必须完成装备、看点定位和飞机程序的培训。
- When possible, an FAA rigger should conduct the Open Parachute Orientation and review of the FARs on packing.
  如果有可能，联邦航空局认证的降落伞装备师应开展关于主伞展开后的降落伞系统的培训，并协助学生回顾 FAR 中关于叠伞的内容。
- When possible, a jump pilot should conduct the Aircraft Briefing and overview of the pertinent sections of FAR 91.
  如果有可能，跳伞作业飞行员应进行飞机简报，并概述 FAR 第 91 部分的相关内容。

category e quiz「E 单元小测」

ADMINISTERED PRIOR TO CONDUCTING JUMPS IN THE NEXT CATEGORY「测试应在进入下一单元跳伞前进行」

Quiz answers are listed in Appendix B.「测验答案列在附录 B 中」

1. What happens to a jumper's fall rate when performing rolls, loops, or other freeflying maneuvers?
   在进行横滚、空翻和其他自由飞动作时，跳伞者的下降速率会发生什么变化？
2. What happens to a visual altimeter when it's in the jumper's burble?
   当高度表处于跳伞者上方的涡流中时，会发生什么？
3. What is the best way to recover from a stall to full glide?
   从失速状态恢复至全速滑翔状态的最佳方法是什么？
4. Describe an aerodynamic stall as it applies to a ram-air canopy.
   请描述空气动力失速如何影响冲压空气式降落伞。
5. When does a dynamic stall occur?
   动态失速在什么时候发生？
6. What happens after a dynamic stall if the tail is held lower than the nose?
   发生动态失速后，如果伞翼后缘（尾部）的位置比前缘（头部）更低，会发生什么？
7. What is the best way to determine a canopy's optimum flare speed and depth for landing?
   找到降落伞着陆时的最佳拉平速度和深度的最好方法是什么？
8. Describe your procedure for landing in high winds.
   请描述大风着陆的程序。
9. How many A-lines does a nine-cell canopy have?
   九孔伞有多少条 A 线？
10. To what part of the canopy do the steering lines (brake lines) connect?
    刹车线连接降落伞的哪个部分？
11. What lines go through the rear slider grommets?
    哪些伞绳穿过滑块布后面的两个金属孔？
12. Where does the main pilot chute bridle attach to the canopy?
    主伞引导伞系带连接降落伞伞布的哪里？
13. Who may pack a main parachute?
    谁可以叠主伞？
14. How often do the main and reserve parachute need to be packed?
    主伞和备伞需要多久叠一次？
15. Who is in command of the aircraft?
    指挥飞机操作的人是谁？
16. Name two purposes for wearing seat belts in an aircraft.
    请说出在飞机上系安全带的两个目的。
17. Who is responsible that the aircraft is in condition for safe flight?
    谁负责确保飞机处于可安全飞行状态？
18. Above what altitude MSL is the pilot of an unpressurized aircraft required to breathe supplemental oxygen?
    在海拔多少英尺以上，非增压机舱的飞机的飞行员需要补充氧气?
19. Above what altitude MSL are all occupants of an unpressurized aircraft required to be provided with supplemental oxygen?
    在海拔多少英尺以上，非增压机舱的飞机上的所有乘客都需要补充氧气？
20. In an aircraft with the exit door near the back, what must jumpers do to maintain the balance during exit procedures?
    在一架舱门在机尾的飞机上，在各跳伞者出舱的过程中，为了保持飞机平衡，跳伞者必须做些什么？

21. What is the biggest danger to a jumper when flying the canopy pattern?
    当跳伞者在降落伞航线上飞行时，最大的危险是什么？
22. What is the best way to avoid a canopy collision?
    避免与其他跳伞者发生碰撞的最佳方法是什么？
23. How does the RSL work?
    联动装置（RSL）的工作原理是什么？
24. What would happen if the main riser attached to the RSL breaks?
    如果连接 RSL 的主伞组提带断裂，会发生什么情况？
25. What is the best way to prevent risers from breaking?
    预防组提带断裂的最佳方法是什么？
26. Name one way to prevent a dual deployment.
    请说出一种防止两个降落伞（主伞和备伞）同时打开的方法。
27. What is generally the best action to take in the following two-canopy-out scenarios?
    在以下的两个降落伞同时打开的情况中，最佳的应对措施通常是什么？
    a. Biplane「两伞一前一后的情况」
    d. Side by side「两伞一左一右紧贴的情况」
    e. Downplane「主伞和备伞分处两边的情况」

Categories F-H Group Skydiving Skills「F 至 H 单元：团体跳伞技能」

Skydiving is a sport for individualists who like to do things together. In the first portion of the USPA Integrated Student Program, Categories A-E, you focused on the skills required to survive independent freefall: stability control, deployment at the correct altitude, landing in a clear area, and how to use the equipment.
跳伞是个性主义者们喜欢一起做的运动。在 USPA 综合学生计划的第一部分，即 A 单元至 E 单元中，重点是独立自由落体所需的生存技能：稳定控制、在正确高度开伞、在空旷区域着陆，以及如何使用装备。

The remaining three categories, F-H, prepare you for more advanced freefall control. More importantly, you get ready for skydiving in groups—in freefall and under canopy.
剩下的三个单元，即 F 单元至 H 单元，是为更高级的自由落体控制做准备。更重要的是，学生要准备好进行团体跳伞—自由落体时和开伞后。

Your education continues in canopy flight, equipment, and aircraft skills essential for safety. Soon, you'll graduate and become independent of supervision. Detailed review also continues on the emergency procedures introduced in the first-jump course.
伞控，装备和飞机等必不可少的安全技能教学也会继续进行。很快，学生将会毕业并且无需监督。第一跳课程中介绍的紧急程序也会在下面继续回顾。

With the direct assistance of other qualified staff members, such as the USPA Coach, the USPA Instructor continues to supervise your training and monitor your progress during all remaining student jumps until you obtain your USPA A license.
在其他合格工作人员（如 USPA 初级教练）的直接协助下，USPA 教练继续监督学生的培训，并在所有剩余的学生跳期间监控进度，直至学生获得 USPA A 执照。

The freefall portions of Categories F through H address group flying techniques and skills. Under the supervision of a USPA Instructor, a USPA Coach may train you for the freefall skills in these last three categories and accompany you in freefall.
F 单元至 H 单元的自由落体部分教授团体飞行的技巧和技能。在 USPA 教练的监督下，USPA 初级教练可为学生培训最后三个单元的自由落体技术，并陪同学生进行自由落体。

After completing all training and jumps at the end of Category H, you may sign up for a USPA A-license check dive with a USPA Instructor.
在完成 H 单元的所有的训练和跳伞后，学生可以与 USPA 教练进行 USPA A 执照检查跳。

Categories F-H prepare you for more advanced freefall control. More importantly, you get ready for skydiving in groups—in freefall and under canopy.
F 单元至 H 单元是为更高级的自由落体控制做准备。更重要的是，学生要准备好进行团体跳伞—自由落体时和开伞后。

4-F F 单元 Category F

INTRODUCTION「序言」

Tracking is a basic group skydiving skill that enables jumpers to gain sufficient freefall separation for a safe opening. It is such an important skill that the freefall training in this category is devoted entirely to tracking techniques.
Tracking 是一项基本的团体跳伞技术，它能使跳伞者之间有足够的自由落体距离间隔，从而能够安全地开伞。这是一项非常重要的技能，因此本单元自由落体训练完全聚焦于 Tracking 技术。

To begin, while supervising yourself in freefall, you practice the basics of the delta position, the first step toward a flat track. The USPA Coach will evaluate and refine your tracking skills as part of the jumps in Categories G and H. Tracking evaluation is also part of the A-license check dive with the USPA Instructor.
首先，学生在自由落体状态下进行自我监督时，要练习三角（Delta）姿势的基本技能，这是通向平 Track 的第一步。作为 G 单元和 H 单元的一部分，USPA 初级教练将评估和帮助学生改善 Tracking 技能。Tracking 也是 USPA 教练评估 A 执照检查跳的一部分。
（*译者注：平 Track，即 Flat Track，是一种前进速度较快，下降速率较慢，Tracking 轨迹相对于地面的角度较平坦的 Tracking*）

Flying the canopy slowly and performing flat, altitude-conserving turns is an important skill that can help you out of a difficult landing approach in a tight area.
操作降落伞缓慢飞行，并会在转向时保持平缓，减少高度损失是一项重要的技能，可以帮助学生在狭小的降落区应对较困难的着陆进近。

You'll learn more about how to handle aircraft emergency exit procedures independently. Emergency review includes power line recognition, avoidance, and landing procedures. During this category, former AFF students should make a practice clear and pull from 5,500 feet, followed by a clear-and-pull jump from 3,500 feet, as required for the A license.
学生将了解更多关于如何独立进行飞机紧急出舱程序的知识。紧急程序的复习回顾部分则包括了高压线的识别、回避和着陆程序。在这一单元中，原 AFF 学生应根据 A 执照的要求，练习一次 5500 英尺的净空开伞，并随后进行一次 3500 英尺的净空开伞（*译者注：即分别跳 5500 英尺和 3500 英尺的低空*）。

By now, you're ready to learn how to pack and should begin working with a packing instructor.
现在，学生已经准备好学习如何叠伞，并应该开始向叠伞教练学习。

The staff continues to build your understanding of aircraft procedures on jump run with emphasis on separation between groups exiting on the same pass. You also learn the specific procedures for coordinating with the pilot or jumpmaster in the event of an aircraft emergency.
工作人员将继续帮助学生加深对飞机跳伞飞行程序的理解，并重点强调同批次不同组的团体出舱时间间隔。学生还将学习在飞机紧急情况下与飞行员或跳伞指导（Jumpmaster）协调的具体程序。

ALL STUDENTS「所有学生」

- two tracking jumps
  2 次含 Tracking 的跳伞

FORMER AFF STUDENTS「原 AFF 学生」

- two clear-and-pulls
  2 次净空开伞（低空）

RECOMMENDED MINIMUM DEPLOYMENT「建议最低开伞高度」

- 4,000 feet
  4000 英尺

Category at a Glance「单元概览」

ADVANCEMENT CRITERIA「晋级标准」

EXIT AND FREEFALL「出舱和自由落体」

- cumulative three tracking sequences: track for five seconds within 30 degrees of the planned heading, turn 180 degrees, and track back for five seconds
  Tracking 三步走：在预定方向的 30 度范围内进行 5 秒 Tracking，转 180 度，然后做 5 秒 Tracking 回来.
- two clear and pulls (already accomplished by former IAD and static-line students)
  2 次净空开伞（原 IAD 和 Static Line 学生已经完成）

CANOPY「伞控」

- cumulative four 180-degree turns under canopy while flying in deep brakes
  开伞后，在深拉刹车的状态下做四个 180 度转向
- braked approach and landing on a canopy that allows for a safe braked landing
  使用允许带刹车着陆的降落伞进行带刹车进近和着陆
- cumulative two unassisted landings within 82 feet of the planned target (jumps from previous categories count toward accuracy requirements)
  在距离计划着陆目标 82 英尺的范围内累计进行两次无协助的着陆（前面单元的跳伞降落如果达到这个精度要求，也算在内）

EQUIPMENT「装备」

- one complete pack job with assistance
  在协助下叠一次伞
- perform a pre-jump equipment check on another jumper fully rigged and ready to jump
  对另一位完全穿好装备并准备好的跳伞者进行跳伞前装备检查

AIRCRAFT AND SPOTTING「飞机和看点定位」

- spot the aircraft, including all procedures, with minimum assistance
  在最低限度的协助下定位飞机的位置，包括所有流程

ORAL QUIZ「口试」

BOOK STUFF「参考资料」

- study USPA Basic Safety Requirements for A license holders (SIM Sections 2-1.B; G.3; H.2; J.1.a; J.2-3; M.5; and N)
  学习 USPA 对 A 执照持有者的基本安全要求（SIM 2-1.B、G.3、H.2、J.1.a、J.2 至 3、M.5 和 N）
- study USPA conditions, requirements, and privileges for A-license holders (SIM Section 3-1)
  学习 USPA A 执照持有者的条件、要求和特权（SIM 3-1）
- study USPA recommendations on recurrent training (SIM Section 5-2)
  学习 USPA 关于复训的建议（SIM 5-2）
- study SIM Section 5-1.F to review power-line landing procedures
  学习 SIM 5-1.F，回顾高压线着陆程序
- study USPA recommendations on group separation during jump run (SIM Section 5-7)
  学习 USPA 关于跳伞航线上团体之间的出舱间隔的建议（SIM 5-7）
- read the owner's manuals for the main and reserve canopies and the harness and container system in use for jumps in this category
  阅读本单元所使用的降落伞的主伞、备伞、背带和伞包系统的用户手册

CATEGORY F: LEARNING AND PERFORMANCE OBJECTIVES「学习和能力表现目标」

- introduction to tracking「Tracking 入门」
- two clear and pulls (former AFF students)「2 次净空开伞（原 AFF 学生）」
- braked turns, approaches, and landings「带刹车转向、进近和着陆」
- extending the glide「延长滑翔距离和时间」
- power-line landing review「复习高压线着陆」
- packing with assistance「在协助下进行叠伞」
- checking others' equipment「检查他人的装备」
- procedures following inactivity「长期不跳伞后的复训流程」
- winds aloft and the exit point「高空风和出舱点」
- separating groups during exit「如何分组出舱，以及出舱间隔」

A. EXIT AND FREEFALL「出舱和自由落体」

1. Initiating track「Tracking 的开始」
   a. First locate a point on the horizon.
      首先在地平线上找一个参考点。
   b. Smoothly extend both legs fully to initiate forward motion.
      双腿平稳完全伸直，以开始向前运动。
   c. Control in the delta and track positions:
      Delta 和 Tracking 的方向控制：
      (1) Dip one shoulder slightly in the direction of the turn to make heading corrections (instructor technique may differ).
          向转向方向稍微沉肩，以修正方向（教练可能教不同的技巧）。
      (2) Make only small corrections.
          仅做微调。
   d. Slowly extend your torso by stretching your shoulders toward your ears and flatten your arch.
      慢慢地伸展躯干，肩膀耸向耳朵，减少弓形，身体展平。
   e. Fully extend your arms to the side 90 degrees to your spine and level with your hips (instructor technique may vary).
      双臂充分伸展，与脊椎呈约 90 度角，并与臀部平齐（教练可能教不同的技巧）。
2. Refining the track「Tracking 的优化」
   a. Once establishing a heading in a positive forward dive, fully extend both legs with your knees locked and toes pointed.
      一旦开始方向稳定地俯冲向前运动，充分伸展双腿，锁住膝盖，脚尖伸直。
   b. Stiffen your body slowly into a slight reverse arch, pushing down and forward slightly with your shoulders, while keeping your hands level with your hips.
      身体绷直，做轻微的反向弓形，肩膀微微向下前方推，同时双手继续与臀部保持平齐。
   c. Continually adjust your body position to effectively meet the relative wind.
      不断调整身体姿态，以有效顶风。
3. Tracking practice procedure「Tracking 练习流程」
   a. Experienced jumpers often allow only five to ten seconds to obtain adequate separation.
      经验丰富的跳伞者通常只用 5 到 10 秒的时间来分开足够的距离。
   b. Practice entering and refining an on-heading track for five seconds, reversing direction, and repeating.
      用 5 秒钟练习如何启动方向稳定的 Tracking 并优化姿态，然后转向，继续重复。
4. Tracking jump safety「Tracking 的安全」
   a. Fly exactly perpendicular to the jump run to avoid others up and down the line of flight.

垂直于飞机的跳伞航线飞行，以避免他人出现在 Tracking 路线的上方或下方。

b. Always plan tracking dives with other groups in mind.
计划 Tracking 时，一定要考虑到其他团体。

c. Learn to control a track on heading first, then develop techniques for pitch and speed.
首先要学会控制 Tracking 的方向，然后再提升俯仰调整和速度调整的技巧。

5. Clear and pull (AFF students only—IAD and static-line students have already met the clear-and-pull requirement in Category C.)
净空开伞（仅限 AFF 学生— IAD 和 Static Line 学生已经满足 C 单元的净空开伞要求）

a. A clear and pull is used for emergency exits and pre-planned low-altitude jumps.
净空开伞被用于紧急离机和有计划的低空跳伞。
（译者注：国内教学中常将学生阶段的净空开伞训练称作“跳低空”，应注意，从建筑物、山崖等处定点跳伞也常称作“低空跳伞”，但两者是不同的概念）

b. Use a familiar, stable exit technique.
使用熟悉的、稳定的出舱方法。

c. Present your hips to the relative wind and execute normal pull procedures (without wave-off) to deploy within five seconds of exit.
顶胯朝向来流，执行正常的开伞程序（无需挥手示意），在出舱后 5 秒内开伞。

d. Expect the parachute to open in relation to the relative wind, not overhead as usual.
由于相对气流方向的原因，做好心理预期，降落伞可能不像往常一样在头顶上方打开。

e. The sequence consists of a clear and pull from two altitudes:
该系列训练由两个高度的净空开伞组成：

(1) first from 5,500 feet
第一次是 5500 英尺净空开伞

(2) once successful, from 3,500 feet
一旦成功，再进行 3500 英尺净空开伞

B. CANOPY「伞控」

1. Braked turns:「带刹车转向」

a. Performed correctly, braked turns provide the quickest heading change with the least altitude lost.
如果方法正确，带刹车转向可以让跳伞者以最快的角速度转向，同时高度损失最小。

b. A braked turn may be the best choice when a quick heading change is needed.
当需要快速改变方向时，带刹车转向可能是最佳选择。例如以下情况：

(1) when suddenly encountering another jumper under canopy or someone in the landing area
降落伞飞行期间突然遇到另一位跳伞者，或降落区有人时

(2) recognizing an obstacle
识别障碍物时

(3) too low to recover from a full- flight turn
高度太低，无法从全速飞行的转向中恢复直飞时

c. Practice braked turns.
练习带刹车转向。

(1) From the slowest speed at which the canopy will fly, raise one toggle slightly to initiate a heading change in the opposite direction.
从降落伞能够正常飞行的最慢速度开始，稍微升起一侧刹车棒，以转向相反方向。

(2) Try to change heading as quickly as possible without banking or stalling.
尽可能快地改变航向，同时避免转向时伞倾斜或者失速。

2. Using brakes to attain the maximum glide and minimum descent:
使用刹车实现最高效的滑翔和最小下降率：

a. On lower-glide designs, the minimum descent may begin nearer the half-braked position.
对于低滑翔设计的降落伞，最小下降率可能在接近半刹车位置。

b. On higher-glide designs, the minimum descent may be nearer the three-quarter braked position or just prior to a full stall (reverse flight).
对于高滑翔设计的降落伞，最小下降率可能在接近四分之三刹车位置，或者刚好在完全失速（倒退飞行）之前。

c. Some canopies achieve minimum descent using the back risers instead of the toggles.
有些降落伞通过后组提带而不是刹车棒来实现最小下降率。

d. Minimum sustainable descent (float)：
最慢的可持续的下降（国内俗称 Hold 住）：

(1) allows the jumper to remain above other jumpers on descent
能让跳伞者在伞降时保持在其他跳伞者上方

(2) allows the canopy to cover a greater distance
能让降落伞飞行更远的距离

3. Recognizing and adjusting for minimum descent and maximum glide path
识别与调整，以实现最小下降率和最大滑翔航迹（Glide Path）

a. Look ahead to the point on the ground that appears not to rise or sink in your field of vision.
向前看地面，找视野中不上升或下降的点：

(1) Everything before that point appears to fall.
该点之下的东西看起来都在向视野下方移动。

(2) Everything beyond it appears to rise.
该点之上的东西看起来都在向视野上方移动。

(3) That point is the projected landing point on the canopy's current glide path.
该点就是降落伞当前滑翔航迹上的预计着陆点。

b. Pull the toggles down slightly to see if the stationary point moves farther away.
稍微向下拉动刹车棒，看那个点是否向远处移动。

(1) If so, the glide path has flattened.
如果是这样，那么滑翔航迹变得比之前更平了。

(2) The canopy will cover more distance.
降落伞将飞行更远的距离。

c. Repeat until the point begins to move closer, then return to the maximum glide position that you have just determined.
重复上述步骤，直到这个点开始转而往近处移动，那么刚才的刹车位置就是最大滑翔位置。

4. When flying downwind in maximum glide:
以最大滑翔状态顺风飞行时：

a. As the winds decrease at lower altitudes, your glide path will become steeper.
当高度降低，风力减弱时，滑翔航迹将变得更陡。

b. The actual landing area will be closer than you initially anticipated.
实际着陆区域将比最初预期的要近。

5. Increasing the glide when flying against the wind:
逆风飞行时提高滑翔效率可能会有以下效果：

a. in lighter winds, may improve distance
在较弱的风中，可以延长飞行距离

b. in stronger winds, may slow the canopy too much and reduce its upwind range
在强风中，可能会使降落伞飞行过慢，并缩短逆风飞行的距离

6. Braked pattern and landing approach
带刹车的着陆航线和着陆进近

a. Fly one entire landing pattern in at least half brakes, to determine the effect on glide path.
以至少半刹车的方式飞一次完整的着陆航线，以确定其对滑翔航迹的影响。

b. Plan for a change in glide path.
更改计划，以适配滑翔航迹的改变。

(1) A lower-glide design may require a smaller pattern when flown in brakes.
带刹车飞行时，低滑翔设计的降落伞可能需要缩小着陆航线。

(2) A higher-glide design may require a bigger pattern when flown in brakes; extend the final approach to avoid overshooting the target.
带刹车飞行时，高滑翔设计的降落伞可能需要放大着陆航线；延长最后进近（第三边）以避免越过目标。

c. Fly final approach in quarter to half brakes.
在四分之一刹车到半刹车之间进行最后进近。

d. Flare carefully from the braked position:
小心地从刹车位置开始拉平：

(1) Practice high to avoid a stall.
先在较高的高度练习以避免失速。

(2) To get the best flare may require a shorter, quicker stroke initiated lower to the ground.
为了获得最佳的拉平效果，在接近地面时可能需要短时间内快速拉下刹车。

(3) The stall may occur more abruptly.
失速可能发生得更突然。

(4) Plan for a PLF.
准备 PLF。

e. A smaller canopy may descend too quickly in deep brakes for a safe braked landing.
面积较小的降落伞在深刹车时可能会下降太快，难以安全降落。

7. Accumulate two unassisted landings within 82 feet of the planned target.
在距离计划着陆目标 82 英尺的范围内累计进行两次无协助的着陆。

C. EMERGENCY PROCEDURE REVIEW「紧急程序回顾」

1. Recognizing and avoiding power lines
识别和避开高压线

a. Expect power lines along roads, between buildings, in paths in the forest, and in random places.
道路沿线，建筑物之间，林中小路等随机的地方，都可能有高压线

b. Scan every 500 feet of descent into an unfamiliar landing area and continually scan below 500 feet.
在不熟悉的着陆区域时，每下降 500 英尺仔细观察一次，并在 500 英尺以下持续观察。

2. Power-line landing emergency procedures (training harness): Refer to Section 5-1 of this manual.
高压线紧急着陆程序（使用训练背带练习）：参考本手册 5-1。

D. EQUIPMENT「装备」

1. Pack at least one parachute with the assistance of a knowledgeable packer.
在资深叠伞员的帮助下，至少叠一次降落伞。

2. Discuss the most important points of packing:
讨论叠伞要点：

Note: An FAA rigger is your best resource for this discussion.
注：联邦航空局认证装备师是讨论的最佳人选。

a. lines straight and in place in the center of the completed pack job
伞绳是绷直的，并在叠好的伞的中间

b. slider up

滑块布在上面（滑块布的初始位置）

c. tight line stows to prevent premature line deployment
皮筋绑紧伞绳以防止伞绳被过早释放出去

3. Perform a pre-jump equipment check on another jumper who is in full gear.
对另一位穿好装备的跳伞者执行跳伞前装备检查：

a. “check of threes” in the front
在这位跳伞者面前进行“三个三检查”

(1) three-ring assembly (and reserve static line)
三环系统的装配（以及 RSL）

(2) three points of harness attachment for snap assembly and correct routing, adjustment, and no twists
背带系统的三个卡扣，走线是否正确，是否需要调整，有无扭曲

(3) three operation handles—main activation, cutaway, reserve
三个操作把手：开伞把手、切伞把手、备伞把手

b. pin check back of system, top to bottom
在这位跳伞者背后从上到下检查装备

(1) reserve pin at least halfway seated (and automatic activation device on)
备伞关包针至少在一半位置（且 AAD 打开）

(2) main pin fully seated
主伞关包针完全就位

(3) ripcord cable movement or correct bridle routing
拉索能否移动，引导伞系带的走线是否正确

(4) if collapsible pilot chute, check the indicator window
如果是可缩引导伞，检查指示器窗口

(5) activation handle in place
开伞把手位置正确

c. check personal equipment (“SHAGG”)
检查个人设备（“SHAGG”）
Shoes「鞋子」—tied, no hooks「系好鞋带，鞋上没有会钩住东西的部件」
Helmet「头盔」—fit and adjustment 「大小合适，调整到位」
Altimeter「高度表」—set for zero「调好零点」
Goggles「护目镜」—tight and clean「戴得紧，且护目镜干净清晰」
Gloves「手套」—lightweight and proper size「重量轻、尺寸合适」

E. RULES AND RECOMMENDATIONS「规则和建议」

1. Study USPA BSRs applicable to USPA A-license holders, including Sections 2-1.B; G.2; H.2; I.1.a, 2, and 3; L.5; and M.
学习适用于 USPA A 执照持有者的 USPA 基本安全要求，包括 2-1.B；G.2；H.2；I.1.A、2、3；L.5；M。
2. Study USPA recommendations on training following periods of inactivity, SIM 5-2.
学习 USPA 关于长期不跳伞后的训练建议，SIM 5-2

F. SPOTTING AND AIRCRAFT「看点定位和飞机」

Note: This section should be conducted by a jump pilot or USPA Instructor.
注：本节应由飞行员或 USPA 教练进行教学。

1. Acting without a rated USPA instructor during routine jump operations and aircraft emergencies
在日常跳伞时，以及在飞机有紧急情况时，如果没有 USPA 教练在飞机上：

a. The person spotting the load usually serves as the jumpmaster.
负责给这个架次看点定位的跳伞者通常充当跳伞指导（Jumpmaster）。

b. In larger aircraft, the jumpmaster should establish an exclusive chain of communication with the pilot.
在大飞机上，跳伞指导应与飞行员有专门的通信方式。
(1) A communication assistant should be able to communicate directly with the pilot and the jumpmaster simultaneously.
应有一位沟通助理，能同时与飞行员和跳伞指导进行直接沟通。
(2) Other jumpers should not get involved in communication among the pilot, communications assistant, and the jumpmaster.
其他跳伞者不应干扰飞行员、沟通助理和跳伞指挥之间的沟通。

2. Review of low-altitude exit procedures
低空出舱程序回顾
a. The jumpmaster must determine if jumpers are over a safe landing area and communicate this information to the pilot.
跳伞指导必须确定跳伞者是否在安全着陆区上空，并将此信息传达给飞行员。
b. Establish firm altitudes at which certain aircraft emergency decisions would be made (DZ policy);
确定飞机紧急情况的决断高度（跳伞基地政策）：
(1) altitude below which all jumpers will land with the aircraft
决断高度一：在这个高度以下，飞机发生紧急情况时，所有跳伞者须留在机内与飞机一起降落
(2) altitude below which all jumpers will jump using their reserves
决断高度二：在这个高度以下，飞机发生紧急情况时，所有跳伞者应使用备伞跳伞
(3) altitude below which all jumpers will jump and immediately use their main parachutes
决断高度三：在这个高度以下，飞机发生紧急情况时，所有跳伞者应使用主伞跳伞
c. Jumpers must maintain correct weight distribution in the aircraft, especially during emergency exit procedures.
跳伞者在飞机上的重量分布必须正确，特别是在紧急出舱程序中。

3. The effect of the winds aloft on the exit point
高空风对出舱点的影响
a. Subtract the speed of the headwind on jump run (if flown into the wind) from the true airspeed of the aircraft to determine the ground speed.
跳伞航线上，飞机的真空速减去逆风的风速（如果逆风飞行），可算出飞机的地面速度。
b. Jumpers first get thrown forward on exit (approximately 0.2 miles in calm winds, less with headwind) from residual aircraft speed and then fall straight down or blow toward the target.
跳伞者出舱后，首先会由于飞机的前进速度而被往前抛（无风时大约被前抛 0.2 英里，逆风则近些），然后再垂直下落或随风漂。
c. The winds aloft will cause freefalling jumpers to drift according to the wind's strength and direction.
高空风会使自由落体的跳伞者依风的强度和方向发生漂移。
d. Winds generally diminish at lower altitudes.
风力通常在较低的高度减弱。
e. Average the speed and the direction of the winds from exit altitude to 3,000 feet AGL to estimate freefall drift. See the example in Table 4-F.1 for a sea-level drop zone:
可以计算从出舱高度到 3000 英尺之间的平均风速和风向，以估计自由落体漂移距离。以海拔高度为 0 的降落区为例，见表 4-F.1：
(1) If flying jump run upwind, use the average heading of 270 degrees.
如果飞机在跳伞航线上逆风飞行，假设以 270 度作为风的平均去向。
（译者注：下表中，风以"Heading"（去向）表示，而不是以"Direction"（来源方向）表示，根据上下文，本句中的"average heading"应指风的平均去向，而不是飞机的航向）
(2) Aircraft forward throw is approximately 1/8-1/4 mile upwind in the light-to-moderate headwind.
在轻到中等的逆风中，飞机的前抛距离约为逆风 1/8-1/4 英里。

(3) Jumpers fall for one minute, drifting at 1/4 mile per minute for 1/4 mile of drift downwind.
跳伞者自由落体一分钟，以每分钟 1/4 英里的速度在顺风方向上漂移 1/4 英里。

(4) Since the forward throw and the freefall drift approximately cancel each other, the ideal exit point is almost straight over the ideal opening point in this example.
由于飞机前抛和自由落体漂移几乎相互抵消，在本例中，理想出舱点几乎就在理想开伞点的正上方。

CALCULATING FREEFALL DRIFT **计算自由落体漂移量**		
EXAMPLE FOR CALCULATING FREEFALL DRIFT 算例		
Altitude 高度（英尺）	**Heading 风的去向（度）**	**Speed(mph) 速度（英里/小时）**
3,000	250	7
6,000	260	14
9,000	280	16
12,000	290	23
Average 平均	**270**	**15**
Table 4-F.1. Averaging the winds aloft. ***表 4-F.1. 计算平均高空风***		
Note: Averaging wind force and direction works sufficiently in common jump conditions. A vector analysis provides more accurate results. *注：对风速和风向计算平均值已经足够用于大多数跳伞情形。如需更高精度的计算结果，可进行向量分析。*		

4. Group separation on jump run (SIM 5-7).
跳伞航线上，各团体出舱的间隔（SIM 5-7）
5. Perform all duties on jump run with minimum assistance, including—
在最低限度的协助下完成跳伞航线上的所有任务，包括—
   a. operating the door (if the pilot allows)
   操作舱门（如果飞行员允许）
   b. monitoring progress during jump run
   在跳伞航线上监视飞行进度
   c. directing the pilot to the correct spot
   引导飞行员飞到正确的点位
   d. choosing the correct exit point
   选择正确的出舱点

dive flows「跳伞流程」

CATEGORY F FREEFALL DIVE FLOWS「F 单元自由落体流程」

DIVE PLAN #1: TRACKING

「计划 1：Tracking」

- Spot with minimal assistance.「在尽量少的协助下看点定位」
- Choice of exit position.「选择出舱姿势」
- Track for five seconds, turn 180 degrees, return.「做 5 秒 Tracking，转 180 度，再 Tracking 回来」
- Altitude check.「检查高度」
- Repeat until 6,000 feet.「重复进行，直至 6000 英尺」
- Wave off and pull by 4,000 feet.「挥手示意并在 4000 英尺开伞」

DIVE PLAN #2: CLEAR AND PULL FROM 5,500 FEET (FORMER AFF STUDENTS ONLY)

「计划 2：5500 英尺净空开伞（原 AFF 学生）」

- Spot with minimal assistance.「在尽量少的协助下看点定位」
- Poised exit.「扒机身出舱」
- Initiate deployment within five seconds.「在 5 秒内开始开伞」

DIVE PLAN #3: CLEAR AND PULL FROM 3,500 FEET (FORMER AFF STUDENTS ONLY)

「计划 3：3500 英尺净空开伞（原 AFF 学生）」

- Spot with minimal assistance.「在尽量少的协助下看点定位」
- Poised exit.「扒机身出舱」
- Initiate deployment within five seconds.「在 5 秒内开始开伞」

CATEGORY F CANOPY DIVE FLOW「F 单元开伞后流程」

DIVE PLAN #1: BRAKED TURNS

「计划 1：带刹车转弯」

- Check altitude, position, and traffic.「检查高度、位置、交通」
- Pull toggles smoothly and evenly to deep brakes.「平稳且两侧对称地拉下刹车至深刹车位置」
- Perform a 180-degree-braked turn then return to full flight.「进行 180 度的带刹车转弯，然后恢复全速飞行」
- Check altitude, position and traffic.「检查高度、位置、交通」
- Pull toggles smoothly and evenly to deep brakes.「平稳且两侧对称地拉下刹车至深刹车位置」
- Perform a 180-degree-braked turn in the other direction then return to full flight.
  「向另一方向进行 180 度的带刹车转弯，然后恢复全速飞行」
- Check altitude, position and traffic.「检查高度、位置、交通」
- Repeat to no lower than 2,000 feet.「重复上述流程，直至 2000 英尺」
- The coach measures the student's landing distance from the planned target.
  「降落后测量学生与计划着陆目标的距离」

DIVE PLAN #2: BRAKED MANEUVERS AND LANDING (FROM 5,000 FEET):

「计划 2：带刹车机动和降落（从 5000 英尺开始）」

- Check altitude, position, and traffic.「检查高度、位置、交通」
- Pull toggles smoothly and evenly to half-brakes hold for 3 seconds and finish the flare at a normal speed.
  「平稳且两侧对称地拉下刹车至半刹车位置，保持 3 秒，然后以正常速度完成拉平」
- Return to full flight for 10 seconds.「恢复全速飞行 10 秒」
- check altitude, position, and traffic.「检查高度、位置、交通」
- Pull toggles smoothly and evenly to a half-brake position hold for 3 seconds and finish the flare at a quicker than

normal speed.
「平稳且两侧对称地拉下刹车至半刹车位置，保持 3 秒，然后快于正常的速度完成拉平」

- Return to full flight for 10 seconds.「恢复全速飞行 10 秒」
- check altitude, position, and traffic.「检查高度、位置、交通」
- Pull toggles smoothly and evenly to a half-brake position while facing into the wind and observe glide path change.
  「逆风飞行时，平稳且两侧对称地拉下刹车至半刹车位置，观察滑翔航迹的变化」
- Return to full flight.「恢复全速飞行」
- check altitude, position, and traffic.「检查高度、位置、交通」
- Turn 180 degrees.「转 180 度」
- Pull toggles smoothly and evenly to a half-brake position while going with the wind and observe glide path change.
  「顺风飞行时，平稳且两侧对称地拉下刹车至半刹车位置，观察滑翔航迹的变化」
- Return to full flight.「恢复全速飞行」
- check altitude, position, and traffic.「检查高度、位置、交通」
- Fly landing pattern in half-brake position, if winds permit.「半刹车走着陆航线，如果风况允许的话」
- Flare from the braked position, if winds and canopy permit.「从半刹车位置开始拉平，如果风况允许的话」
- The coach measures the student's landing distance from the planned target.
  「降落后测量学生与计划着陆目标的距离」

CATEGORY F EQUIPMENT「F 单元装备」

- Pack with assistance.「在协助下叠伞」

category f quiz「F 单元小测」

ADMINISTERED PRIOR TO CONDUCTING JUMPS IN THE NEXT CATEGORY「测试应在进入下一单元跳伞前进行」

Quiz answers are listed in Appendix B.「测验答案列在附录 B 中」

1. What is the best way to change the direction of canopy flight while conserving the most altitude?
   在降落伞转向时减少高度损失的最佳方法是什么？
2. What happens if a canopy is controlled too deeply in the brakes?
   如果降落伞刹车拉太深会发生什么？
3. Describe the difference between flaring from half brakes and full glide.
   描述从半刹车位置开始拉平和从全速飞行状态下开始拉平之间的区别。
4. How does the half-braked position affect the canopy's flight?
   半刹车如何影响降落伞的飞行？
5. What is a glide path?
   什么是滑翔航迹？
6. How do you determine your glide path?
   如何确定滑翔航迹？
7. How does wind affect the glide path?
   风对滑翔航迹有什么影响？
8. How is heading corrected during a track?
   如何在 Tracking 中纠正航向？
9. When making tracking jumps from a large plane, why is it important to track perpendicular to the jump run?
   在大飞机上进行 Tracking 跳伞时，为什么垂直于跳伞航线飞很重要？
10. What is the ground speed of a jump aircraft with a true airspeed of 90 knots when flying against a 50-knot headwind on jump run?
    一架真空速为 90 节的飞机，在跳伞时迎着 50 节的逆风飞行时的地面速度是多少？
11. How can jumpers assure adequate separation between groups exiting the aircraft?
    跳伞者如何确保出舱的各团体之间有足够的间隔距离？
12. What are the three most important aspects of packing the main canopy?
    叠主伞最重要的三个方面是什么？
13. How can you tell if the RSL is routed correctly?
    如何判断 RSL 的走线是否正确？
14. What is the make and model of parachute system you are jumping?
    你要跳的降落伞系统是什么牌子和型号的？
    a. Main canopy?
       主伞？
    b. Harness and container system?
       背带和伞包系统？
    c. AAD?
       自动激活装置（AAD）？
15. What is the minimum pull altitude allowed for student skydivers and A license holders?
    学生和 A 执照持有者允许的最低开伞高度是多少？
16. What are the maximum winds allowed for student skydivers?
    学生的最大风力限制是多少？
17. If a jumper falls for one minute through upper winds averaging 30 mph from the west:
    如果一名跳伞者在平均时速 30 英里的从西边吹来的高空风中自由落体 1 分钟：
    a. How far will the jumper drift? Note: 60 mph = 1 mile per minute; therefore, 30 mph = 1/2 mile per minute.

跳伞者会飘多远？注：60 英里/小时=1 英里/分钟，因此 30 英里/小时=0.5 英里/分钟。

b. In which direction?
往哪个方向飘？

18. Describe your procedure for landing in power lines.
描述高压线着陆程序。

19. In the event of an aircraft emergency with no students or instructors aboard, who should coordinate procedures between the pilot and the other jumpers on the load?
如果飞机发生紧急情况，且没有学生或教练在飞机上，谁应该负责飞行员和其他跳伞者之间的协调？

20. At your drop zone, what is the lowest altitude the pilot would likely ask jumpers to leave the plane during a routine engine-out emergency?
在你的降落区，在常规的发动机熄火紧急情况下，飞行员可以要求跳伞者离开飞机的最低高度是多少？

21. In an aircraft emergency, what is the lowest exit altitude that you would deploy your main parachute before choosing the reserve instead?
在飞机紧急情况下，你可以选择仍然使用主伞而不是备伞的最低出舱高度是多少？

22. How many jumps are required for the USPA A license?
USPA A 执照需要多少跳数？

23. What does a USPA A license permit a skydiver to do?
USPA A 执照允许跳伞者做什么？

24. What should an A-licensed jumper do to regain currency after a ten-week period of inactivity?
持 USPA A 执照的跳伞者在 10 周不跳伞后，应该做些什么来恢复独立跳伞资格？

25. What should an A-licensed jumper do to regain currency after a four-month period of inactivity?
持 USPA A 执照的跳伞者在 4 个月不跳伞后，应该做些什么来恢复独立跳伞资格？

4-G G 单元Category G

INTRODUCTION「序言」

Freefall skills in Category G address group skydiving maneuvers. They are outlined here for the discipline of formation skydiving (flat, or belly flying) but can be performed in other orientations with a USPA Coach knowledgeable in those techniques. The same performance and advancement criteria for maneuvering, docking, breakoff, and gaining separation for a safe opening apply, however.
G 单元的自由落体技能主要针对团体自由落体，概述了进行编队跳伞（腹飞）的原则，有其他形式编队跳伞相关经验的 USPA 初级教练也可以进行该形式的编队跳伞教学。但不管怎样，在移动、连接、分离、在足够远的距离下安全开伞这些方面，对学生表现的要求和晋级标准是一致的。

In Category G, you'll review more in depth the procedures for avoiding and responding to canopy collisions, always more of a risk in group jumping. By now, you should be looking for traffic and steering with rear risers before releasing your brakes.
在 G 单元中，学生将更深入地回顾避免降落伞碰撞的程序以及如何应对降落伞碰撞的程序，通常这是团体跳伞时较大的风险。到目前为止，学生应该能够在释放刹车棒之前，先看清交通状况，并先用后组提带转向。

After opening, you'll explore the performance envelope of the ram-air canopy to prevent surprises near the ground. Practice includes maximum-performance turns, reverse turns, and keeping the wing in balance during performance maneuvers to avoid a line twist. You'll learn to feel the turn.
开伞后，学生将探索冲压空气式降落伞的性能范围，以防止在地面附近发生预料之外的情况。本单元的练习包括最大性能转向，反向转弯，以及让伞翼在高性能机动期间仍保持平衡，以避免线缠绕。学生要学会感受转向。

You'll take another look at avoiding tree landings and what to do in case one is inevitable.
学生将复习如何避免降落在树上，以及在树降不可避免的情况下该怎么办。

By now, you should be packing with minimal assistance, but USPA recommends supervision until your A license. Along with practicing packing, you'll learn how to inspect the equipment for wear and how to prevent it. Before advancing, you should understand the responsibilities of the FAA rigger, who maintains most items
现在，学生应该在几乎无协助的情况下叠伞，但 USPA 建议学生获得 A 执照前的叠伞都受到监督。练习叠伞的同时，学生将学会检查装备的磨损情况，以及如何减缓磨损。在晋级至下一单元之前，学生应该了解联邦航空局认证的降落伞装备师的职责。装备师负责大部分装备部件的维护。

All skydivers need to respect the power of various kinds of weather, which begins with understanding basic weather patterns and reading the danger signals. A pilot or instructor advises you on practical ways to predict the kind of weather that could compromise your safety
跳伞者需尊重天气的力量，首先要了解基本的天气模式，解读危险天气的信号。飞行员或教练评级持有者会教一些实用的方法来预测可能危及跳伞安全的天气。

ALL STUDENTS「所有学生」

- four jumps 4 跳

RECOMMENDED MINIMUM DEPLOYMENT「建议最低开伞高度」

- 3,500 feet
  3500 英尺

Category at a Glance「单元概览」

ADVANCEMENT CRITERIA「晋级标准」

EXIT AND FREEFALL「出舱和自由落体」

- two redocks from ten feet without assistance
  在无协助的情况下，从 10 英尺处起进行 2 次再连接
- two redocks requiring an adjustment in fall rate
  2 次需要调整下降速率的再连接
- break off at the planned altitude without prompting
  无需提示的情况下，在计划高度分离
- track 50 feet within ten degrees of the planned heading
  在计划航向 10 度范围内进行 50 英尺的 Tracking

CANOPY「伞控」

- four maximum-performance reverse canopy turns
  四次最大性能反向转弯
- two unassisted landings within 65 feet of the target (jumps from previous categories count toward accuracy requirements)
  在距离计划着陆目标 65 英尺的范围内累计进行两次无协助的着陆（前面单元的跳伞降落如果达到这个精度要求，也算在内）

EQUIPMENT「装备」

- one complete pack job without assistance
  一次完整的叠伞，无需协助

AIRCRAFT AND SPOTTING「飞机和看点定位」

- spot the aircraft, including all procedures, without assistance
  在没有协助的情况下，定位飞机位置，包括所有流程

ORAL QUIZ「口试」

BOOK STUFF「参考资料」

- read and discuss USPA recommendations for tree landings (SIM Section5-1.F)
  阅读并讨论 USPA 关于树降的建议（SIM 5-1.F）
- read and discuss USPA recommendations to experienced jumpers for automatic activation devices and reserve static lines (SIM Sections 5-3.F and G.)
  阅读并讨论 USPA 对有经验的跳伞者的自动激活装置（AAD）和 RSL 的建议（SIM 5-3.F 和 G）
- read and discuss USPA recommendations for canopy collisions (SIM Section 5-1.H)
  阅读并讨论 USPA 关于降落伞碰撞的建议（SIM 5-1.H）
- read and discuss USPA recommendations regarding weather (SIM Section 5-5)
  阅读并讨论 USPA 关于天气的建议（SIM 5-5）
- read and discuss USPA recommendations on group freefall skydiving, SIM Section 6-1
  阅读并讨论 USPA 关于团体自由落体跳伞的建议（SIM 6-1）
- read and discuss additional USPA recommendations on breakoffs for freeflying groups in SIM Section 6-2.E.5
  阅读并讨论 SIM 6-2.E.5 中 USPA 关于自由飞的团体的分离的补充建议
- read and discuss FAR 65.125 through .133 (performance standards for parachute rigger privileges, record keeping,

and seal requirements)

阅读并讨论 FAR 65.125 至.133（关于降落伞装备师的特权、记录流程和铅封要求的标准）

- read and discuss FAA regulations for packing main and reserve parachutes (FAR 105.43.a and .b)
  阅读并讨论联邦航空局关主伞和备伞的叠伞规定（FAR 105.43.a 和.b）
- read and discuss FAA regulations for maintaining automatic activation devices (FAR 105.43.c)
  阅读并讨论联邦航空局关于维护自动激活装置（AAD）的规定（FAR 105.43.c）

CATEGORY G: LEARNING AND PERFORMANCE OBJECTIVES「学习和能力表现目标」

- group exits「团体出舱」
- floater position「舱外离机者的位置」
- forward and backward movement「向前和向后移动」
- adjusting fall rate「调整下降速率」
- start and stop「动作的开始和停止」
- docking「连接」
- maximum-performance canopy turns「降落伞的最大性能转向」
- collision avoidance and response review「避免降落伞碰撞以及应对措施的回顾」
- tree landing review「树降的回顾」
- equipment maintenance inspection「装备维护检查」
- weather for skydivers「跳伞天气」

A. EXIT AND FREEFALL「出舱和自由落体」

1. Group exits「团体出舱」
   a. Practice for an efficient climbout and launch.
      练习高效的爬出机舱和跳出。
      (1) Each jumper in a group has an assigned exit position and should know that position before climbout.
      团体跳伞中的每个跳伞者都有指定的出舱位置，在爬出机舱之前应该知悉这个位置。
      (2) The exit position should include specific, exact foot and hand placement for the best launch position and presentation of hips and limbs into the relative wind.
      出舱位置的安排应涵盖特定且精确的手和脚的位置，以获得最佳跳出姿势，让胯部和四肢正确迎风。
      (3) The jumpers count together with body movement, where possible, for a simultaneous or near-simultaneous launch.
      如有可能，跳伞者可通过身体动作信号来协同出舱时刻，以便同时或几乎同时跳出。
   b. Exit into a neutral body position and hold aircraft heading.
      出舱后采取中性身体姿势，身体朝向同飞机航向。
   c. Relax and confirm stability prior to turning toward your coach.
      在转向教练之前，放松并保持稳定。
   d. exit grips「互相抓握着一起出舱」
      (1) If taken, grips should allow all jumpers to leave in a natural flying position.
      如果跳伞者之间互相抓握着一起出舱，所采用的抓握方式应便于各跳伞者以中性飞行姿势出舱。
      (2) Main lift web and chest strap grips are counterproductive for most belly-to-earth group exits.
      如果抓住另一位跳伞者的主支撑带（Main Lift Web，简称 MLW）和胸带来出舱，往往会加大腹飞出舱的难度。
2. Forward and backward movement (belly to earth)
   （腹飞）向前和向后移动
   a. Use legs only for forward movement and steering.
      只将腿用于控制向前运动和转向。
      (1) Extending both legs tilts the jumper head-low and begins a slide in that direction.
      伸展双腿会使头往下倾，并开始向那个方向滑行。
      (2) Extending one leg more than the other causes a turn in the opposite direction.
      一条腿比另一条腿伸得多，会导致向反方向转向。
         (i) Extending the right leg causes a left turn.
         伸展右腿会导致左转。
         (ii) Extending the left leg causes a right turn.

伸展左腿会导致右转。

b. Maintain both arms in neutral during forward movement and docking.
在向前移动和连接时，保持双臂处于中性姿势。

c. Extend both arms and push down for backward movement.
伸展双臂并向下压，会使跳伞者向后移动。

d. Extending the arms slightly to take a grip will counter forward movement but cause backsliding if initiated too soon or for too long.
稍微伸展双臂以握住另一位跳伞者时，会抵消向前的移动效果，如果伸臂太快或太久，还会导致倒退移动。

3. Adjusting fall rate (belly to earth)
（腹飞）调整下降速率

a. Increase vertical freefall speed by streamlining.
通过更加流线型的姿势来加快垂直自由落体下落速率。
(1) hips forward「顶胯」
(2) shoulders back「肩膀后收」
(3) relax abdominal muscles「放松腹部肌肉」

b. Slow freefall speed by creating maximum turbulence.
通过增大湍流来减慢自由落体下落速率。
(1) cupping the shoulders around the sternum
肩膀前弯，含胸
(2) rounding the spine (cupping the abdomen)
脊柱前弯（腹部呈杯状）
(3) extending arms or legs to counterbalance and maintain a level attitude
伸展手臂或腿以保持平衡和水平的姿态

c. When recovering altitude from below the level of a formation:
当低于自由落体团体编队的高度，需要回到编队高度时：
(1) Turn 90 degrees relative to the formation to keep it in view.
相对于编队旋转 90 度，以保持编队在视线内。
(2) To avoid a collision, remain clear of the area immediately below and above any group.
为避免碰撞，请不要靠近任何团体编队的正下方或正上方的区域。

d. Recognize the visual cues for level approach (on exit, regardless of the horizon):
如何水平靠近对方的视觉提示（出舱时，无论相对地平线的姿态怎样）：
(1) backpack in sight—come down
能看到对方的伞包—向下飞
(2) front of the leg straps in sight—come up
能看到对方的腿带前部—向上飞

e. Maintain altitude awareness.
保持高度意识

4. Docking「连接」

a. Dock using a level approach.
水平靠近并连接。

b. Once docked, arch across the shoulders to maintain the fall rate (elbows up) and stay level with your partner or the formation.
对接后，肩膀上拱以保持下降速率（肘部抬起），并与同伴或团体编队保持水平。

c. Extend both legs to counter any tension created in the formation when holding grips.
伸展双腿，以抵消互相抓握时编队成员间的拉力。

d. Maintain altitude awareness.
保持高度意识。

5. Break-off「分离」
   a. Check altitude every four or five seconds and after each maneuver.
      每隔四五秒，以及每做一次动作后，都要检查高度。
   b. Break off without prompting.
      在无需提示的情况下分离。
   c. Plan the break-off altitude to allow enough time to track 50 feet.
      预先计划分离高度时，需要考虑预留足够时间来做 50 英尺的 Tracking。
   d. The most positive way to signal break-off is to turn and track.
      示意分离最直接方式是转向和 Tracking。
      (1) As a safety back-up in Categories G and H—
          为提高 G 单元和 H 单元的安全性—
          (i) If the coach waves his or her arms, immediately turn and track to the planned deployment altitude.
              如果教练挥动手臂，应立即转向，并 Tracking 至计划的开伞高度。
              *（译者注：如 3-3 所述，在本书的翻译中，USPA 初级教练（Coach）和 USPA 教练（Instructor）是两个不同的概念，“教练”不包含“初级教练”。教练评级持有者可在其培训方法中履行初级教练的职责。因此对于本单元的内容，虽然上文原文中表述为由初级教练评级持有者（Coach）进行，但实际上初级教练和教练均可进行教学。**为避免读者误解某些内容仅能由初级教练进行教学，同时为了表述方便，仅在 G 单元和 H 单元的翻译中，初级教练和教练统一用“教练”称呼，需要特指 Instructor 时，译文将采用“教练评级持有者”或“USPA 教练”的严谨表述**）*
          (ii) If the coach deploys, deploy immediately without tracking.
              如果教练开伞，学生也立即开伞，无需 Tracking。
          (iii) Deploy at planned altitude whether or not you have turned or tracked.
              在计划的开伞高度开伞，无论是否进行了转向或 Tracking。
          (iv) Never rely on the USPA Coach for breakoff or deployment cues.
              决不依赖教练给出分离或开伞信号
      (2) You are always responsible to break off and open at the planned altitude on jumps with the USPA Coach and with others after you get your license.
          无论是学生期间与教练跳伞，还是拿到执照后与他人跳伞，分离并在计划高度开伞都是跳伞者自己的责任。
   e. When tracking, establish and maintain the correct heading radially from the formation.
      Tracking 时，确立一个以团体中心点为圆心的正确径向航向，并在 Tracking 时保持这个航向。
   f. For beginners, tracking moderately in a straight line in the right direction is more effective than going fast in a curve or in the wrong direction. Break off high enough to gain separation.
      对于初学者来说，慢慢地沿着正确的方向做直线 Tracking，比快速但方向不受控地 Tracking，或沿着错误方向 Tracking 更有用。应预留足够高的高度分离，以能够分开足够的距离间隔。
6. For additional requirements for break-offs from freeflying jumps, see SIM 6-2.
   有关进行自由飞时的分离的附加要求，请参见 SIM 6-2。
7. To avoid hard openings, slow to minimum freefall velocity before deploying.
   为避免降落伞爆开（*译者注：即开伞速度过快，国内俗称爆开*），开伞前应将自由落体下落速率降至最慢。

B. CANOPY「伞控」

1. Performance turn entry and exit with balance
   在平衡状态下开始高性能转弯和结束高性能转弯
   a. Enter a turn only as quickly as the canopy can maintain balance (center of lift over the center of load) during the turn.
      要在降落伞能够保持平衡的范围内（降落伞的升力中心高于载荷重心）进行快速转向机动。
   b. Surging, lurching, or line twist indicate a turn entered too quickly.

急剧上冲、突然倾斜或线缠绕都是转向开始得太快的信号。

c. A canopy is more susceptible to collapse from turbulence during entry and exit from a turn.
在开始或结束转弯时，降落伞更容易因乱流而塌缩。

d. The canopy dives sharply after a maximum-performance turn.
降落伞在最大性能转向后会急剧下冲。

2. Reverse turns「反向转弯」

a. You must know the maximum safe rate of turn entry for each canopy you jump.
跳伞者必须知道自己所使用的每个降落伞在保证安全的前提下启动转向所允许的最大转向启动速度。

b. Practicing reverse turns helps you determine the maximum safe toggle turn rate before inducing a line twist.
练习反向转弯有助于确定在不会导致线缠绕的前提下通过控制刹车棒进行转弯的最大安全转向速度。

c. Make a smooth but deep turn at least 90-degrees to the right, return to level flight for a split second, then reverse toggle positions smoothly but quickly for a 180-degree turn to the left (four sets recommended to complete Category G).
首先做一个平稳的深度转向，向右转至少 90 度，然后短暂恢复平飞，再快速而平稳地反转刹车输入，向左转 180 度（建议做 4 组这样的操作以完成 G 单元的学习）。

d. Line twist can occur if the toggle is pulled down too quickly when starting a turn, or raised too quickly to stop a turn.
如果在开始转向时刹车棒拉得太快，或在停止转向时松得太快，则可能会发生线缠绕。

e. The goal of this exercise is to learn the limits of the toggle input for your canopy, not to actually induce a line twist.
这个练习的目的是熟悉降落伞转弯的刹车棒操作限制，而不是真正去触发线缠绕。

f. A line twist at landing pattern altitudes may be unrecoverable in time for a safe landing, particularly with a higher wing loading.
在着陆航线高度发生的线缠绕可能无法及时恢复以进行安全着陆，特别是降落伞翼载较高的情况下。

g. In case you induce a line twist, you should complete all maximum-performance turns above the 2,500-foot decide-and-act altitude for a cutaway.
为以防万一，应在 2500 英尺切伞决断高度之上完成所有的最大性能转向。

3. The potential for collision with other jumpers increases when making performance maneuvers in traffic or near the ground (review)
在附近有其他降落伞时或接近地面时，进行高性能机动会增加发生碰撞的可能性（复习）。

a. Other jumpers may be focused more on the target than on traffic.
其他跳伞者可能更关注着陆目标而不是交通状况。

b. The lower jumper has the right of way.
高度较低的跳伞者有优先通行权。

c. It takes only one jumper to avoid a collision.
只要可能发生碰撞的两方的其中一方进行避让，就可以避免碰撞。

d. Jumping a faster canopy requires more attention to traffic.
飞得更快的降落伞需要更多地注意交通。

4. Accumulate two unassisted landings within 65 feet of a planned target (five total required for A license).
在无协助的情况下，累计在计划着陆目标的 65 英尺范围内着陆 2 次（A 执照总共需要 5 次）。

C. EMERGENCY PROCEDURE REVIEW「紧急程序回顾」

Note: A USPA Instructor should teach this section. A canopy formation specialist is also a good source.
注：USPA 教练应教授本节内容。降落伞编队专家也是很好的咨询对象。

1. Canopy collision avoidance (review)
降落伞碰撞的避免（复习）

a. Know where other nearby jumpers are during opening and steer with the back risers to avoid them.

在开伞时知道附近的其他跳伞者在哪里，并用后组提带转向以避开他们。

b. If a head-on collision is pending, both jumpers should turn right.
如果即将发生正面碰撞，两个跳伞者都应右转。

2. Collision response: Study the USPA recommended procedures in SIM 5-1.
碰撞的应对措施：学习 SIM 5-1 中 USPA 的建议程序。

3. Tree landing avoidance
避免树降

a. Spot clear of large areas of trees or other obstacles, and open high enough to clear them in the event of a bad spot.
看点定位时远离大片树木或其他障碍物，并在足够高的高度开伞，以便在出舱或开伞位置不佳时远离它们。

b. Fly in maximum glide to reach a clear area.
以降落伞的最大滑翔性能进行滑翔，以飞到空旷区域上方。

4. Tree landing procedure review (training harness): Refer to skydiving emergency procedures in SIM 5-1.
树降程序回顾（使用训练背带练习）：参考 SIM 5-1 的跳伞紧急程序。

D. EQUIPMENT「装备」

Note: An FAA rigger should conduct this session:
注：本节内容应由联邦航空局认证的降落伞装备师进行教学：

1. Detailed identification and inspection of high-wear items requiring rigger maintenance
需要降落伞装备师维护的易磨损部件的详细识别和检查

a. pilot chute and deployment handle「引导伞和开伞把手」

(1) Look for broken stitching around the apex and the seam where the pilot chute canopy fabric and mesh meet.
在引导伞顶部以及引导伞伞布面料和网眼布的交汇处寻找断开的缝线。

(2) Check for security at the bridle attachment point.
检查引导伞和引导伞系带的连接处的情况。

(3) The fabric and mesh should be in good condition; both eventually wear out.
面料和网眼布应处于良好状态；两者最终都会受到磨损。

b. bridle velcro「带魔术贴的引导伞系带」

(1) Velcro anywhere degrades with use and needs to be replaced every 100-250 uses.
任何魔术贴都会随着使用而退化，每 100 至 250 次使用就需要更换一次。

(2) Bridle velcro is particularly important, because if it comes loose, it can cause a premature deployment.
引导伞系带的魔术贴特别重要，因为如果它松动，可能会导致意外过早开伞。

(3) Velcro should be clean, dry, and free of debris.
魔术贴应保持清洁、干燥、无碎屑。

c. deployment bag「D 包」

(1) 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。

(2) Check the loops that hold the line stow bands.
检查 D 包上用于固定绑伞绳的皮筋的系环。

(3) If velcro is used, replace it as necessary.
如果使用了魔术贴，应根据需要及时进行更换。

d. closing pin「关包针」

(1) Check that the loop holding the closing pin to the bridle is secure and not being cut by the eye of the pin.
检查把关包针固定在引导伞系带上的那个环是否安全牢固，且没有被割破。

(2) Check for nicks or corrosion on the pin and replace it if any appear.
检查关包针有无划痕或腐蚀，如有则更换。

e. pilot chute attachment「引导伞的连接处」

(1) 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。

(2) 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，应检查这些被加固伞布的缝线是否有断线。

f. likely areas of damage on the top center skin, end cells, and stabilizers
降落伞伞布上表面中心处、末端气室和稳定翼（Stabilizer）的可能受损区域
（译者注：稳定翼，即 Stabilizer，是位于伞布左右两侧边缘的部分）

(1) Check for small holes on the top skin from where the bridle attachment stop ring has caught fabric in the bag's top grommet (avoidable with good packing technique).
检查伞布上表面，引导伞系带与伞布连接处的限位环是否在 D 包顶部金属孔环处夹到或磨到了布料，导致穿孔（叠伞方法合适的话可以避免这个问题）。
（译者注：引导伞系带与伞布连接处的限位环仅在部分降落伞的设计中出现）

(2) Look for wear on the top skin and end cells caused by contact with sharp objects or stickers.
检查伞布上表面的缝线和末端气室是否有尖锐物体或粘滞物接触引起的磨损。

(3) 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（Slider Stop）。
（译者注：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）

(4) 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。

g. slider「滑块布」

(1) Inspect for distortion in the slider grommets and wear around their inside edges.
检查滑块布孔环是否变形，内侧边缘是否磨损。

(2) Sliders are important, high stress components and should be maintained to the highest standard.
滑块布是重要的受力部件，应以最高标准维护。

h. lines「伞绳」

(1) 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（Metal Connector Link）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）

(2) Line damage at the links calls for line replacement, but the rigger can also advise the jumper about link choices, protection and habits that minimize damage.
连接处的伞绳如有损坏，应更换伞绳。降落伞装备师也可以就伞绳连接方式，连接处的保护、使用习惯等给跳伞者提提供建议，以尽量减少磨损。

(3) Lines sometimes shrink unevenly over time.
伞绳有时会随着时间的推移而不均匀地收缩。

(4) All lines eventually require replacement; refer to the manufacturer's recommendations.
所有伞绳最终都需要更换；请参考制造商的建议。

i. slider bumpers (metal connector links)
滑块布缓冲器（仅对于使用金属式连接器的降落伞）
（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）

(1) Slider bumpers protect the slider grommets and lines from damage by taking it themselves; most require periodic replacement.
滑块布缓冲器通过自身承受磨损来保护滑块布孔环和伞绳免受磨损；大多数需要定期更换。

(2) Slider bumpers need to be tight on the link or secured to prevent them from sliding up the lines and stopping the slider.
滑块布缓冲器需要在连接器上拧紧或固定，以防止其滑到伞绳上阻止滑块布移动。

j. brake system「刹车系统」

(1) When Velcro is used, placing the toggles on the risers immediately after landing prevents Velcro damage and tangles.
如有使用了魔术贴，应在着陆后立即在组提带上放好刹车棒，以防止魔术贴损坏和缠结。

(2) Velcro needs to be replaced when worn.
魔术贴磨损时需要更换。

(3) Velcro and general use wears the lower brake lines, which a rigger can easily replace.
较低处的刹车线会由于魔术贴和日常使用而受到磨损，装备师可以很方便地更换此部件。

(4) Examine the brake lock eye for damage and wear.
检查猫眼（Brake Lock Eye）有无损坏和磨损。
（译者注：Brake Lock Eye，也称 Cat Eye，俗称猫眼，是刹车线上的绳环，刹车棒未被释放前会插在此绳环上）

(5) Look at the attachment point for the keeper ring, including the attachment ring stitching on the opposite surface of the riser.
检查刹车线引导环的连接点，包括连接点在组提带另一面的缝线的情况。
（译者注：Keeper Ring，也常称作 Guide Ring，这里译作刹车线引导环，是缝在后组提带上的一个金属环，刹车线从中穿过）

(6) Inspect tuck-tab toggle keepers for security.
检查刹车棒收纳带是否稳固。
（译者注：刹车棒收纳带，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 为刹车棒尾部用于塞入收纳带的部分）

k. riser release system「组提带释放系统」

Note: You will learn three-ring disassembly and maintenance in Category H.
注：H 单元将讲解三环的拆卸和维护。

(1) Look for wear in the loops holding the rings and the white retaining loop, especially if you drag your rig when stowing the lines (not advised).
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，如果叠伞过程中绑伞绳时拖拽伞包（不建议用这种方式叠伞），就更加要注意这一点。

(2) Be sure that any service bulletins on risers for that system have been accomplished.
确保该系统的所有涉及组提带的服务公告的内容都已完成。

(3) Check the fittings on both ends of the cable housings for security.
检查切伞拉索收纳管（Cable Housing）两端是否牢固。
（译者注：切伞拉索收纳管，即 Cable Housing，是收纳切伞拉索的钢管）

(4) Look for kinks in the release cable where it contacts the white retaining loop, which may indicate a problem with hard openings or the design and construction of the three-ring assembly.
检查切伞拉索与白色固定绳接触的地方是否有扭结，如有，可能与开伞过猛有关，或者可能三环的设计和构造有问题。

(5) Check the front and back of the riser webbing for fraying or strains 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扯伤。

(6) Look for broken or loose tackings on the cable housings.
检查切伞拉索收纳管是否有破损或松动。

(7) Check riser inserts (for cutaway cable ends) if installed.
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（如有安装）。
（*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*）

l. riser covers「组提带挡盖」
(1) Replace any retaining Velcro when it loses tackiness.
如果魔术贴失去粘性，应进行更换。
(2) Replace distorted tuck flaps when they become ineffective (happens with use).
如果挡盖的加塞片变形失效，则应进行更换（使用一段时间后会发生）。
（*译者注：组提带挡盖，即 Riser Cover，是背带肩部用于盖住组提带的挡盖。挡盖的加塞片，即 Tuck Flap，在叠伞时被塞入收纳处，使挡盖不易松开*）

m. main container closing grommets「主伞伞包的关包金属环」
(1) Inspect for distortion and fabric damage around the edges.
检查金属环边缘是否变形，附近面料是否损坏。
(2) Feel for severe distortion or breakage of the plastic stiffener inside the fabric where the grommet is set.
触摸感觉关包盖片内部的塑料加固片（关包金属环就固定在上面）是否有严重变形或破损。

n. main and reserve pin covers「主伞关包针和备伞关包针的挡盖」
(1) Replace Velcro when it fails to stay firmly attached.
如果魔术贴失去粘性，应进行更换。
(2) Replace plastic stiffeners when distortion from use renders them ineffective.
如果挡盖内的塑料加固片变形失效，则应进行更换

2. Store the parachute in a cool, dry, dark place.
把降落伞存放在阴凉、干燥、黑暗的地方。
a. Heat weakens AAD batteries; cars are too hot for safe prolonged storage in the summer.
高温会削弱 AAD 电池性能；夏天汽车太热，不能安全地长期存放 AAD。
b. The ultraviolet rays of the sun degrade nylon.
太阳的紫外线会使尼龙材料降解。
c. moisture「潮湿环境」
(1) corrodes hardware (very dangerous, since rust degrades nylon)
会腐蚀金属部件（非常危险，因为金属锈会使尼龙材料降解）
(2) promotes mildew (undesirable but harmless to nylon)
会促使发霉（虽让人不舒服，但对尼龙材料无害）
d. Many chemicals and acids damage parachute materials.
许多化学物质和酸性物质会损坏降落伞材料。
e. Heat may weaken elastic stow bands.
热量会降低绑伞绳的皮筋的强度。

3. Premature deployments near the door.
降落伞在舱门附近过早意外开伞。
a. Handles「降落伞的把手」
(1) Check your handles before moving to an open door
在朝着打开的舱门移动之前，先检查降落伞的各个把手
(2) Be cognizant of your handles when you are near an open door and during climb out
在打开的舱门附近时，以及爬出舱门时，要注意保护降落伞的各个把手
b. Remain clear of the area directly above and below another jumper, in case his or her parachute activates prematurely from the AAD or other unplanned event.
不要靠近另一名跳伞者的正上方和正下方，以防他或她的降落伞因 AAD 或其他意外原因过早打开。

4. Pack one main parachute without assistance.

在没有协助的情况下，叠一次主伞。

E. RULES AND RECOMMENDATIONS「规则和建议」

Note: An FAA rigger should teach this section.
注：本节内容应由联邦航空局认证的降落伞装备师进行教学。

1. It requires at least an FAA senior rigger to maintain and repair the parachute system (FAR 65.125 through .133, Section 9-1 of this manual).
   降落伞系统的维护和维修至少需要联邦航空局认证的资深降落伞装备师来进行（FAR 65.125 至.133，本手册 9-1）。
2. AADs, if installed, must be maintained according to the manufacturer's instructions (FAR 105.43.c, Section 9-1 of this manual).
   如果安装了 AAD，则必须按照制造商的说明（本手册 9-1 的 FAR 105.43.c）进行维护。

F. SPOTTING AND AIRCRAFT「看点定位和飞机」

Note: A pilot or instructor should teach this section.
注：本节内容应由飞行员或 USPA 教练进行教学。

1. Refer to the information on weather in Section 5-7 of this manual and discuss:
   请参阅本手册 5-7 中有关天气的内容，并讨论：
   a. weather conditions hazardous to skydivers
      对跳伞者不利的天气条件
   b. practical methods to observe weather and obtain forecasts
      气象观测与预报的实用方法
2. Select the spot and guide the pilot to the correct position without assistance in routine weather conditions.
   在常规天气条件下，在无需协助的情况下，看点定位并引导飞行员飞到正确位置。

dive flows「跳伞流程」

CATEGORY G FREEFALL DIVE FLOWS「G 单元自由落体流程」

DIVE PLAN #1: FORWARD MOVEMENT TO DOCK

「计划 1：前进并连接」

- Coach observes spot「教练看点定位」
- Front floater exit position (outside strut) until successful.
  「采用舱外离机的出舱方式，在舱门前部出舱（利用飞机的外部支撑结构），练习直到成功」
- Initiate count after coach OK.「教练示意 OK 后开始做出舱信号」
- Face the direction of flight until stable (two to three seconds).「面向飞机飞行方向，直到稳定（2 到 3 秒）」
- Coach moves into position and docks.「教练就位，然后和教练进行连接」
- Check altitude and nod.「检查高度和点头」
- Coach backs up five feet and adjusts levels as necessary.「教练后退 5 英尺，并根据需要调整水平相对高度」
- Move forward and take grips.「学生向前移动并抓握教练」
- Altitude check every five seconds or after each maneuver, whichever comes first.
  「每隔 5 秒或每次动作后进行一次高度检查，以先到者为准」
- Coach backs up ten feet; move forward and take grips.「教练后退 10 英尺；然后学生向前移动并抓握教练」
- Altitude check every five seconds or after each maneuver, whichever comes first.
  「每隔 5 秒或每次动作后进行一次高度检查，以先到者为准」
- Repeat until breakoff.「重复练习直到分离」
- Initiate break-off at 5,500 feet and turn to track.「在 5500 英尺处分离，然后转向并进行 Tracking」
- Coach remains in place and evaluates track.「教练位置保持不变，并评估学生的 Tracking」
- Wave off and pull by 3,500 feet.「在 3500 英尺挥手示意并开伞」

DIVE PLAN #2: DOWN AND UP

「计划 2：向下和向上移动」

- Coach observes spot「教练看点定位」
- Rear floater exit position (inside strut) until successful.
  「采用舱外离机的出舱方式，在舱门后部出舱（利用飞机的内部支撑结构），练习直到成功」
- Initiate count after coach OK.「教练示意 OK 后开始做出舱信号」
- Face direction of flight until stable.「面向飞机飞行方向，直到稳定」
- Turn to face coach.「转向以面对教练」
- Coach moves into position and docks.「教练就位，然后学生和教练进行连接」
- Check altitude and nod.「检查高度和点头」
- Coach backs up five feet and increases fall rate.「教练后退 5 英尺，并加快下降速率」
- Remain in position and match coach's fall rate.「学生位置保持不变，跟上教练的下降速率」
- Altitude check every five seconds or after each maneuver, whichever comes first.
  「每隔 5 秒或每次动作后进行一次高度检查，以先到者为准」
- Coach slows fall rate.「教练减缓下降速率」
- Remain in position and match coach「学生位置保持不变，匹配教练的下降速率」
- Repeat until response is quick and accurate.「重复练习直到学生反应快速且准确」
- Break off at 5,500 feet.「在 5500 英尺处分离」
- Coach remains in place and evaluates track.「教练位置保持不变，并评估学生的 Tracking」
- Wave off and pull by 3,500 feet.「在 3500 英尺挥手示意并开伞」

DIVE PLAN #3: DOCKING WITH PROBLEMS

「计划 3：结合下降速率调整和前后移动的连接」

- Coach observes spot「教练看点定位」
- Review either floater position.「复习两种舱外出舱位置的其中一个」
- Initiate count after coach OK.「教练示意 OK 后开始做出舱信号」
- Face direction of flight until stable.「面向飞机飞行方向，直到稳定」
- Turn to face coach.「转向以面对教练」
- Coach moves into position and docks.「教练就位，然后学生和教练进行连接」
- Check altitude and nod.「检查高度和点头」
- Coach backs up ten feet and changes fall rate.「教练后退 10 英尺并改变下降速率」
- Match coach's fall rate to level and dock.「学生调整下降速率，并与教练水平连接」
- Altitude check every five seconds or after each maneuver, whichever comes first.
  「每隔 5 秒或每次动作后进行一次高度检查，以先到者为准」
- Repeat until response is quick and accurate.「重复练习直到学生反应快速且准确」
- Break off at 5,500 feet.「在 5500 英尺处分离」
- Coach remains in place and evaluates track.「教练位置保持不变，并评估学生的 Tracking」
- Wave off and pull by 3,500 feet.「在 3500 英尺挥手示意并开伞」

CATEGORY G CANOPY DIVE FLOWS「G 单元开伞后流程」

- Check altitude, position, and traffic.「检查高度，位置和交通状况」
- Make a sharp, balanced 90-degree turn.「快速、平衡地转 90 度弯」
- Reverse the toggle position aggressively and make a balanced 180-degree turn.
  「猛地反向操作刹车棒，在平衡状态下向反方向进行 180 度转向」
- Check altitude, position, and traffic.「检查高度，位置和交通状况」
- Repeat to no lower than 2,500 feet, in case of line twist.
  「在不低于 2500 英尺的高度重复以上练习，以防备万一发生线缠绕」
- Coach measures the student's landing distance from a planned target.
  「教练测量学生与计划着陆目标的偏离距离」

CATEGORY G EQUIPMENT「G 单元装备」

- Owner inspection-of-equipment briefing by FAA rigger
  「装备所有者的装备检查知识，由联邦航空局认证的降落伞装备师介绍」
- Pack without assistance「在无协助的情况下叠伞」

category g quiz「G 单元小测」

ADMINISTERED PRIOR TO CONDUCTING JUMPS IN THE NEXT CATEGORY「测试应在进入下一单元跳伞前进行」

Quiz answers are listed in Appendix B.「测验答案列在附录 B 中」

1. What is the primary directional control when moving forward to dock in freefall?
   在自由落体状态下前进连接时，主要通过什么来控制方向？
2. What is the minimum break-off altitude for freefall in groups of five or fewer?
   五人或五人以下团体自由落体的最低分离高度是多少？
3. What is the danger of entering a toggle turn too quickly?
   操纵刹车棒转向太快有什么危险？
4. What does a canopy do after completing a maximum input toggle turn?
   以最大的刹车棒输入来进行转向，完成转向后，降落伞会发生什么？
5. What are the three biggest dangers of a hard toggle turn near the ground?
   在接近地面的情况下，急剧操纵刹车棒转向的三大危险是什么？
6. What are the first things to do in the event of a collision and entanglement with another jumper?
   如果与另一名跳伞者发生碰撞和缠绕，首先要做什么？
7. What is the most critical aspect of closing the main container equipped with a hand-deployed pilot chute?
   对于使用手抛式引导伞的主伞伞包，关包时的关键点是什么？
8. Why is it a bad idea to drag the harness and container system when stowing the lines?
   为什么绑伞绳时拖动背带和伞包系统是不好的？
9. When velcro is used on the brake system, why is it a good idea to place your toggles back on the velcro after you land?
   刹车棒带有魔术贴时，为什么要在着陆后将刹车棒的魔术贴贴回去？
10. Who may maintain a main parachute system?
    谁可以对主伞系统进行维护？
11. Why is it bad to leave a parachute in the sun?
    为什么把降落伞放在太阳底下晒是不好的？
12. What damage could occur from storing a parachute for prolonged periods in a car during the summer?
    在夏天里把降落伞长时间放在汽车里会造成什么损害？
13. What happens to velcro touch fastener when it is used frequently?
    魔术贴频繁使用时会发生什么情况？
14. What happens to stiffened tuck flaps that are frequently used?
    频繁使用的硬质加塞片（Tuck Flap）会变得怎样?
15. Who publishes and enforces rules regarding parachute packing and parachute maintenance?
    谁发布和施行有关降落伞叠伞和维护的规则？
16. What may result if recovering altitude (floating up) under a freefall formation?
    如果跳伞者在自由落体团体编队的下方提升高度（向上浮动），可能会产生什么结果？
17. What extra consideration is required when sitting or moving towards an opened door?
    在飞机舱内就坐时，以及朝着打开的舱门移动时，需要额外考虑什么？
18. Why is it important to remain clear of the area directly above and below other jumpers in freefall?
    为什么在自由落体时必须远离其他跳伞者正上方和正下方的区域？
19. Why is it important to maintain an automatic activation device to the manufacturer's standards?
    为什么按照制造商的标准维护 AAD 很重要？
20. What is the correct response to a canopy entanglement with another jumper below 1,000 feet if it appears the two canopies cannot be separated in time for a safe landing?
    如果在 1000 英尺以下与另一名跳伞者的降落伞发生缠绕，而两名跳伞者无法及时分开并安全着陆，应如何处

理?

21. Describe your procedure for landing in trees.
    描述树降程序。
22. What does a tall cumulus cloud indicate?
    厚的积雨云意味着什么？
23. What is the most dangerous part of an incoming front for aircraft and skydivers?
    对于飞机和跳伞者，冷暖气团接触的锋面的最危险的影响是什么？
24. How does a canopy's air speed, ground speed, and descent rate change with an increase in density altitude?
    降落伞的空速、地面速度和下降速度如何随着密度高度的增加而变化？

4-H H 单元Category H

INTRODUCTION「序言」

The last category of the ISP finishes preparing you for the USPA A-license so you can supervise yourself as an independent skydiver. These are the last jumps where you require USPA Instructor supervision. Next you take your test.
综合学生计划的最后一单元为学生获取 USPA A 执照做最终准备工作，获得执照后学生可毕业成为独立的跳伞者，进行自我监督。本单元的跳伞是学生需要 USPA 教练监督的最后几次跳伞。接下来学生将参加考试。

Freefall skills combine gross movements using the start and stop principle to dive toward a position in the sky relative to another jumper, followed by the fine movements to safely dock that you learned in Category G. The freefall briefing includes a discussion on safety and the importance of recognizing and controlling formation approach speeds. You'll also learn to look around while tracking, signaling for pull, and during deployment.
自由落体技巧的学习内容包括如何开始俯冲向另一跳伞者附近的位置，如何减速停止俯冲，以及如何进行微调以安全与另一跳伞者连接（G 单元内容）。对自由落体进行简报时，会对跳伞安全以及如何判断飞向团体编队的速度和如何控制接近速度进行讨论。学生还会学习如何在 Tracking、示意开伞，以及开伞过程中观察周围。

Under canopy, students with sufficient upper body strength explore the use of the front risers. The instructor explains the benefits and dangers of front-riser maneuvers. The discussion includes how to best recover from a turn made too low, one of the sport's biggest killers.
开伞后，上肢力量较好的学生可尝试使用前组提带。USPA 教练将解释前组提带操作的优点和危险点。还将讨论从低转中恢复的最佳方法，低转是这项运动中最致命的危险点之一。

Emergency procedure review covers unintentional water landings.
紧急程序的回顾包括了意外水上降落。

You should be able to demonstrate how to maintain the three-ring release system and replace a main container closing loop, two common owner operations.
学生应展示其有能力维护三环释放系统，以及替换主伞关包绳，这是两种常见的装备所有者应会的操作。

Although A-license holders are not qualified for demonstration jumps, you will be authorized to jump off the regular DZ into landing areas meeting the BSRs for students and A-license holders. In this last category as a formal skydiving student, you'll study the FAA requirements for jumps into the airspace over a private field, including what additional approvals may be necessary for the jump aircraft. This discussion should be with a jump pilot who can discuss those sections of FAR 105.
尽管 A 执照持有者没有资格进行跳伞表演，你将有权降落在常规降落区以外的，符合基本安全要求对学生和 A 执照持有者的规定的着陆区域。在最后一个单元中，作为一名正式的跳伞学生，你将学习联邦航空局关于在私人领地上方空域进行跳伞的要求，包括执行跳伞作业的飞机可能需要哪些额外的批准。这方面的讨论应该与可进行 FAR 105 相应内容讨论的飞行员一起进行。

ALL STUDENTS「所有学生」

- four jumps 4 跳

RECOMMENDED MINIMUM DEPLOYMENT「建议最低开伞高度」

- 3,000 feet
  3000 英尺

Category at a Glance「单元概览」

ADVANCEMENT CRITERIA「晋级标准」

EXIT AND FREEFALL「出舱和自由落体」

- two dives and docks with minimum assistance
  在尽量少的协助下进行两次俯冲和连接
- break off at the planned altitude without prompting
  在无需提示的情况下，在计划高度分离
- track 100 feet within ten degrees of the planned heading
  在计划航向的 10 度范围内进行 100 英尺 Tracking

CANOPY「伞控」

- two cumulative 90-degree front-riser turns
  累计 2 次使用前组提带转 90 度弯
- two cumulative 180-degree front-riser turns
  累计 2 次使用前组提带转 180 度弯
- total of five unassisted landings within 65 feet of the target (A-license requirement)
  在距离计划着陆目标 65 英尺的范围内累计进行 5 次无协助的着陆（A 执照要求）

EQUIPMENT「装备」

- disassemble, perform owner maintenance, and reassemble three-ring release system
  拆卸、维护和重新组装三环释放系统
- remove and replace or adjust a main container closing loop
  拆下、更换或调整主伞关包绳

ORAL QUIZ「口试」

A-LICENSE CHECK DIVE「A 执照检查跳」

BOOK STUFF「参考资料」

- study USPA recommendations on unintentional water landings (SIM Section 5-1.F)
  学习 USPA 关于意外水上降落的建议（SIM 5-1.F）
- study USPA recommendations on recovery from low turns (SIM Section 5-1.I)
  学习 USPA 关于如何从低转中恢复的建议（SIM 5-1.I）
- study USPA recommendations on incident reporting (SIM Section 5-8.A and B)
  学习 USPA 关于事件报告的建议（SIM 5-8.A 和 B）
- review the breakoff recommendations for groups (SIM Section 6-1)
  查看关于团体分离的建议（SIM 6-1）
- skim FAR 105.13 to overview radio requirements for jump operations
  浏览 FAR 105.13 关于跳伞作业的无线电通信要求
- study FAR 105.15 and AC 105.2 , Appendix 1 (prior notice requirements before jumping)
  学习 FAR 105.15 和 AC 105.2 附录 1（跳伞前的事先通知要求）
- skim AC 105.2, Appendix 2 (aircraft approved for flight with door removed)
  浏览 AC 105.2 附录 2（经批准可在拆除舱门的情况下飞行的飞机）

CATEGORY H: LEARNING AND PERFORMANCE OBJECTIVES「学习和能力表现目标」

- diver exit「俯冲出舱」
- diving「俯冲」
- breakoff「分离」
- front riser control「前组提带的控制」
- water landing review「水降回顾」
- owner maintenance of gear「装备所有者的装备维护」
- aircraft radio requirements「飞机无线电通信要求」
- FAA notification requirements for jumping「联邦航空局关于跳伞通知的规定」
- FAA approvals for jump planes「联邦航空局对跳伞作业飞机的批准」

A. EXIT AND FREEFALL「出舱和自由落体」

1. Diver exit「俯冲出舱」
   a. Twist out the door to place your hips and chest into the air coming from ahead of the aircraft, with your body oriented side-to-earth.
      出舱同时扭转身体，髋部和胸部迎向飞机前方的来流中，身体一侧朝向地面。
   b. Exit in a slow-fall position to arrest your forward throw from the aircraft, which is moving you away from your coach.
      采取低下降速率的姿势出舱，以抵消飞机前抛的力道，飞机的前抛会使学生和教练分开一段距离。
   c. Before starting to dive, hold the slow-fall position for two to three seconds while slowly turning toward your coach.
      在开始俯冲前，保持低下降速率的姿势 2 到 3 秒，同时慢慢转向教练。
   d. Use a delta position to begin diving toward your coach.
      使用 Delta（三角）姿势开始向教练俯冲。
2. Using your spine to adjust dive angle
   用脊柱调整俯冲角度
   a. Initiate the dive with your legs fully extended.
      双腿完全伸展，以启动俯冲。
   b. Follow the person ahead closely, but be prepared to slow rapidly.
      紧跟前面的跳伞者，但要做好迅速减速的准备。
      （*译者注：这部分介绍了俯冲接近其他跳伞者的一般知识，就学生而言，这里“前面的跳伞者”代指教练*）
   c. Pitch up or down by curving your spine to increase or flatten the angle of the dive.
      通过弯曲脊柱来增加或减小俯冲的角度。
   d. Use fast- and slow-fall technique to adjust vertical position relative to the diver ahead.
      使用高下降速率或低下降速率的姿势，以调整相对前方跳伞者的高度差。
   e. For safety and to prevent a collision, dive with an escape path in mind.
      为了保证安全，防止碰撞，俯冲时要预先在心中规划好避撞路线。
3. Traffic on approach to the formation
   接近团体编队时注意交通
   a. Dive in a straight line.
      沿直线俯冲。
   b. Prevent collisions by watching for other jumpers while on approach to the formation.
      在接近编队时，注意其他跳伞者，防止碰撞。
4. Start, coast and stop「开始、滑行和停止」
   a. Once you are about halfway to the target, return to a more neutral position.
      一旦快接近目标（约半途位置），回到更中性的姿势。

b. You can increase your speed to the target if you find you have slowed too soon.
如果发现减速早了，可以提高飞向目标的速度。

c. Use a flare position (arms forward) to slow and stop at a position level and 10-20 feet away from the target; visual cues:
采取 Flare（减速接近）姿势，手臂前伸，减速并停在与目标距离 10-20 英尺的同一水平面位置；视觉提示：

(1) back pack in view: approaching too high
能看到对方的降落伞伞包：接近时高度过高

(2) front of harness in view: approaching too low
能看到对方的背带前部：接近时高度过低

d. Begin a level approach using legs only.
只用腿来控制水平方向接近。

e. Remain aware of traffic to each side and for errant jumpers below the approach path.
注意两侧交通情况，并防备路线下方有跳伞者犯错。

5. Rapidly arresting forward movement (very effective)：
快速抵消向前移动的速度的方法（非常有效）：

a. Extend both arms forward.
双臂向前伸展。

b. Use slow-fall technique (cup sternum and abdomen).
采取低下降速率的姿态（胸骨和腹部收成杯状）。

c. Drop both knees.
双膝下放。

6. Breaking off and tracking「分离和 Tracking」

a. Plan break-off altitude high enough for the jumper with the least experience to track to a safe distance from the formation, at least 100 feet for groups of five or fewer (minimum distance required for A-license check dive).
分离高度应设得足够高，使经验少的跳伞者能够 Track 到离编队足够远的安全距离，5 人或 5 人以下的团体编队应分离至少 100 英尺（A 执照检查跳要求的最短距离）。

b. breakoff「分离」

(1) The minimum breakoff altitude recommendations contained in the section on Group Freefall in this manual apply to very experienced formation skydivers jumping at a familiar location, using familiar equipment, and jumping with familiar people.
本手册关于团体自由落体的章节中对于最低分离高度建议适用于经验丰富的团体编队跳伞者在熟悉的地方、使用熟悉的装备与熟悉的人一起跳伞的情况。

(2) If any of these conditions are not met, add 500-1,000 feet to your planned breakoff.
如果未满足以上条件中的任何一个，则计划分离高度应再增加 500-1000 英尺。

c. Develop techniques to scan and steer clear of other jumpers ahead and below.
提升相关技巧，以观察和避开前方和下方的其他跳伞者。

d. 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.
在挥手示意和开伞过程中，向侧方和上方观察附近是否有其他跳伞者，这样降落伞一打开就可以开始避让。

B. CANOPY「伞控」

1. Using front risers「前组提带的使用」

a. Front risers may be used to dive the canopy:
前组提带可用于操作降落伞进行俯冲：

(1) Applying half brakes for several seconds immediately before starting these maneuvers will reduce riser

pressure
即将开始前组提带操作之前，先半刹车几秒，可减少操作前组提带所需的力量

(2) to lose altitude rapidly
快速削高（降低高度）

(3) to maintain position over ground in strong winds
在强风中保持相对地面的位置

b. Heading control with front risers depends on
前组提带的方向控制取决于

(1) airspeed「空速」

(2) the rate of turn「转向速度」

(3) the speed of turn entry「启动转向的速度」

c. Heading control with front risers takes practice to become predictable.
使用前组提带进行方向控制需要不断练习才能熟悉。

d. Practice heading control with front-risers.
练习用前组提带控制方向。

(1) Pull both front risers down to dive straight ahead.
将两个前组提带向下拉，向前直线俯冲。

(2) Pull one front riser to complete two 90-degree and two 180-degree turns.
拉动其中一个前组提带完成两个 90 度转向和两个 180 度转向

e. Initiate a sharp, deep front-riser turn, raise the riser slightly to decrease the turn rate, and then pull the riser fully down again to attempt to increase the rate of the turn.
开始深拉前组提带进行急转，然后稍微松开组提带降低转向速度，然后再次将组提带完全向下拉以加快转向速度。

(1) The rate of turn may not increase.
转向速度可能不会加快。

(2) The resistance on the riser may make it too difficult to pull the riser down farther after raising it.
组提带上的阻力可能使组提带松开后很难再向下拉。

(3) This exercise demonstrates the different nature of front-riser heading control.
这个练习体现了前组提带方向控制的特殊性。

f. Complete all front-riser maneuvers by 2,000 feet.
在 2000 英尺以上完成所有前组提带操作。

2. Front-riser safety「前组提带的安全操作」

a. Watch for traffic below and to the sides prior to initiating a front-riser dive.
在开始操作前组提带进行俯冲前，注意下方和两侧的交通。

b. Front riser maneuvers can be very dangerous near the ground:
在地面附近操作前组提带非常危险：

(1) Turbulence may affect canopy heading or descent rate.
湍流可能影响降落伞的航向或下降速率。

(2) A mishandled front-riser turn can lead to an undesirable heading, e.g., towards an obstacle, without time to complete the turn safely before landing.
前组提带转向操作不当可能会导致降落伞转向不应该去的方向，例如朝向障碍物，且没有时间在着陆前安全完成转向。

(3) A crowded landing pattern is never the place for high-speed maneuvers.
着陆航线上有很多降落伞时，永远不应该进行高速机动。

c. Keep both steering toggles in hand when performing front-riser maneuvers to make heading changes more reliably and quickly if necessary.
在操作前组提带时，应保持两个刹车棒握在手中，以便在必要时更可靠、快速地改变航向。

3. Accuracy: perform the remaining unassisted landings within 65 feet of the planned target to meet the USPA A-license requirements (five total required).
着陆精准度：在距离计划着陆目标 65 英尺的范围内累计进行 5 次无协助的着陆，以满足 USPA A 执照的要求。

C. EMERGENCY PROCEDURE REVIEW「紧急程序回顾」

1. Flotation devices for water landings—「水上降落的漂浮装置」
   a. water is an obstacle as defined in the BSRs (section 2-1 in this manual)
   根据基本安全要求，水域被视为一类障碍物（参见本手册 2-1 节）
   b. are required for some jumpers; refer to the BSRs on Parachute Equipment
   对于一些跳伞者来说，漂浮装置是必须的；请参考有关降落伞装备的基本安全要求。
   c. are recommended for jumpers using ram-airs when jumping within a mile of water
   使用冲压空气式降落伞在离水域一英里范围内跳伞时，建议使用漂浮装置
2. Adjust the planned spot to avoid bodies of water.
可调整计划出舱点，避开水域。
（*译者特注：紧急程序回顾的排版，英文 PDF 版本与网页版略有不同，这里以 PDF 版本为准*）
3. Procedures for an unintentional water landing (see Section 5-1 in this manual)
意外水上着陆程序（见本手册第 5-1 节）
4. Recovery from a turn made too low, over or to avoid water (see Section 5-1 in this manual)
在水域上方低转时，或为避开水域而低转时，如何从低转中恢复（见本手册第 5-1 节）

D. EQUIPMENT「装备」

Note: An FAA rigger or instructor should teach this section.
注：本节内容应由联邦航空局认证的降落伞装备师或 USPA 教练进行教学。

1. Owner maintenance of three-ring release system:
装备所有者对三环释放系统的维护：
   a. Disassemble the system every month to clean the cable and massage the ends of the risers.
   每月拆卸三环系统，以清洁切伞拉索并揉拭组提带末端。
      (1) Nylon riser webbing develops a memory, especially when dirty.
      尼龙材质的组提带会产生记忆性，特别是脏的时候。
      (2) When disassembled, twist and massage the nylon webbing around the two riser rings.
      拆卸后，扭转并擦拭两个组提带上的环的周围的尼龙织带。
   b. Clean the cables.「清洁切伞拉索」
      (1) Most three-ring release cables develop a sludge-like coating that causes them to bind, increasing the required pull force.
      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。
      (2) Refer to the manufacturer's instructions for cleaning.
      请参阅制造商的清洁指引。
2. Use the correct bands for each type of lines:
对不同类型的伞绳使用正确的皮筋：
   a. Smaller lines require the smaller bands.
   较小的伞绳用较小的皮筋。
   b. Larger bands may be required for larger lines.
   较大的伞可能需要较大的皮筋。
   c. Line stow bands should grasp the line stow bights tightly, resulting in six to 11 pounds of force to extract.
   皮筋应紧紧绑住伞绳，绑好后应需要 6 至 11 磅的力来将伞绳抽出。
   d. Replace each stow band as it stretches, wears, or breaks.

更换被拉长的、磨损或断裂的皮筋.

3. Main closing loop「主伞关包绳」
   a. Damage greater than ten percent warrants replacement.
      磨损超过 10%则需要更换。
   b. tension「张力」
      (1) Tension must be sufficient to keep the container closed in freefall.
          关包绳的张力必须足以使伞包在自由落体过程中不意外打开。
      (2) The closing pin should require eight to 11 pounds to extract (or check owner's manual).
          关包针应需要 8 到 11 磅的力拔出（或参考制造商的用户手册）。
      (3) A loose closing loop could result in a premature deployment.
          关包绳松动可能导致意外过早开伞。
      (4) Freeflying maneuvers increase the importance of closing system security.
          自由落体过程中进行自由飞机动时，关包系统的稳固性显得更加重要。
      (5) Adjust the closing loop tension by moving the overhand knot or replacing the loop with the knot tied in the correct place.
          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。
   c. Use only closing loop material approved by the harness and container manufacturer.
      只能使用背带和伞包系统制造商批准的材料制作关包绳。

E. RULES AND RECOMMENDATIONS「规则和建议」

1. Refer to "Book Stuff" at the beginning of this category for independent study passages.
   独立学习的途径，请参阅本单元开头的"参考资料"。
2. Review all "Book Stuff" from other categories to study for the oral exam given with the A-license check dive.
   复习其他单元的"参考资料"，为 A 执照检查跳的口试内容做准备。

F. SPOTTING AND AIRCRAFT「看点定位和飞机」

Note: An FAA-rated pilot or instructor should teach this section.

注：本节内容应由持联邦航空局等级认证的飞行员或 USPA 教练进行教学。

1. Overview of aircraft radio use requirements
   飞机无线电使用要求概述
   a. The jump aircraft must have an operating radio for jumping to take place.
      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。
   b. The pilot must be in contact with air traffic control prior to jumping.
      跳伞前，飞行员必须与空中交通管制部门取得联系。
   c. Skim the FAA's requirements for radio use in FAR 105.
      浏览联邦航空局对无线电使用的要求，具体见 FAR 105。
2. FAA notification required before a jump
   联邦航空局跳伞前通知规定
   a. A jumper or the pilot must notify the appropriate air traffic control facility at least one hour prior to jumping (no more than 24 hours prior) in most airspace.
      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。
   b. Some drop zones have a written notification renewed annually for that location only.
      有些跳伞基地每年只为其跳伞地点更新一次书面通知。
   c. Skim FAR 105.25 for rules on notifications and authorizations prior to jumping.
      浏览 FAR 105.25 以了解跳伞前的通知和授权规则。
   d. Study the overview of notification and authorization requirements contained in AC 105-2, Appendix 1.

学习 AC 105-2 附录 1 中的通知和授权要求概述。

3. Aircraft approved for flight with door removed
   获批拆除舱门的飞机
   a. Some aircraft are unsafe for flight with the door open or removed.
      一些飞机在舱门被打开或移除的情况下飞行是不安全的。
   b. Aircraft approved for flight with the door removed may require additional modifications and usually require additional FAA field approval.
      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，者通常需要额外的联邦航空局现场批准。
   c. Other modifications to a jump aircraft, e.g., in-flight doors, hand holds, or steps, require additional field approval or a supplementary type certificate.
      对跳伞作业飞机的其他改装，如飞机舱门、扶手或台阶，需要额外的现场批准或补充的型号证书。
   d. Review with the pilot the certificates of approval for modifications on the jump aircraft.
      与飞行员一起检查跳伞作业飞机的改装批准证书。

dive flows「跳伞流程」

CATEGORY H FREEFALL DIVE FLOWS「H 单元自由落体流程」

DIVE PLAN: DIVING「俯冲」

- Exit from the door one second after the coach.「学生在教练出舱后 1 秒钟再出舱。」
- Present belly to wind in the slow fall position and maintain it for two seconds.
  「腹部迎风，采取低下降速率姿势，并保持 2 秒钟。」
- Coach establishes fall rate and holds heading.「教练调整下降速率并保持航向。」
- Turn toward coach.「转向教练。」
- Dive and stop level ten to 20 feet out.「俯冲并停在与教练同一水平面的 10 至 20 英尺处。」
- Altitude check every five seconds.「每隔 5 秒检查一次高度。」
- Approach and take grips.「靠近并抓住教练。」
- Altitude permitting, coach dives to a point 50 to 100 feet laterally and 20 to 40 feet below.
  「如果高度足够，教练俯冲到侧面 50 到 100 英尺，下方 20 到 40 英尺处。」
- Follow and repeat docking procedure.「学生跟上并重复连接。」
- Break off at 5,000 feet.「在 5000 英尺处分离。」
- Coach remains in place and evaluates track.「教练位置保持不变，并评估学生的 Tracking。」
- Wave off and deploy by 3,000 feet.「在 3000 英尺以上挥手示意并开伞。」

CATEGORY H CANOPY DIVE FLOWS「H 单元开伞后流程」

- Check altitude, position, and traffic.「检查高度、位置和交通状况。」
- Perform an on-heading front riser dive (keep toggles in hand).
  「使用前组提带控制降落伞俯冲，航向不变（保持刹车棒在手上）。」
- Check altitude, position, and traffic.「检查高度、位置和交通状况。」
- Perform a 90-degree front riser turn (keep toggles in hand).
  「使用前组提带进行 90 度转向（保持刹车棒在手上）。」
- Check altitude, position, and traffic.「检查高度、位置和交通状况。」
- Perform a 180-degree front riser turn (keep toggles in hand).
  「使用前组提带进行 180 度转向（保持刹车棒在手上）。」
- Check position and altitude.「检查位置和高度。」
- Enter a front riser turn, let up halfway and begin the turn again (keep toggles in hand).
  「使用前组提带转向，转到一半松开前组提带，然后重新开始转向（保持刹车棒在手上）。」
- Complete all front riser maneuvers by 2,000 feet.「前组提带的操作只能在 2000 英尺以上进行。」
- Coach measures your landing distance from a planned target.「教练测量学生与计划着陆目标的偏离距离。」

CATEGORY H EQUIPMENT「H 单元装备」

- Disassemble, clean, and reassemble a three-ring riser release system.「拆卸、清洁和重新组装三环释放系统。」
- Replace or adjust a main closing loop.「更换或调整主伞关包绳」

USPA A-LICENSE CHECK DIVE FLOW「USPA A 执照检查跳流程」

INSTRUCTOR: Refer to SIM Section 3-2 for complete instructions on conducting the USPA A-license examination and check dive. This jump must be evaluated by a USPA Instructor or Examiner:
USPA 教练：请参阅 SIM 3-2，以了解有关 USPA A 执照考试和检查跳的完整说明。此跳必须由 USPA 教练或考官进行评估：

- Spot「看点定位。」
- Choose a comfortable exit.「选择一个舒适的出舱方式。」
- Perform a 360-degree turn to the right and left, and back loop.「执行 360 度右转和左转，以及后空翻。」

- The evaluator moves 20 feet from the candidate and level.
  「评估人（即 USPA 教练或考官）移动至离考生 20 英尺的同一水平面处。」
- Dock on the evaluator.「和评估人进行连接。」
- Initiate breakoff and track a minimum of 100 feet.「开始分离并进行至少 100 英尺的 Tracking。」
- Wave off and pull by 3,000 feet.「在 3000 英尺以上挥手示意并开伞。」
- Follow your preselected landing pattern.「遵循预定着陆航线降落。」

category h quiz「H 单元小测」

ADMINISTERED PRIOR TO CONDUCTING JUMPS IN THE NEXT CATEGORY「测试应在进入下一单元跳伞前进行」

Quiz answers are listed in Appendix B.「测验答案列在附录 B 中」

1. Why is it important to look ahead during a dive toward other jumpers in freefall?
   为什么在自由落体中俯冲飞向其他跳伞者时向前看很重要？
2. What is the fastest way to slow down from a freefall diving approach?
   从自由落体俯冲接近中减速最快的方法是什么？
3. What is the danger of a loose or worn main container closing loop?
   主伞伞包关包绳松动或磨损的危险是什么？
4. Why must three-ring release cables be cleaned periodically?
   为什么必须定期清洁三环释放拉索（切伞拉索）？
5. If you see that you have begun to turn too low to the ground for a safe landing, what should be your first response?
   如果你发现你已经开始低转，无法安全着陆，你的第一反应应该是什么？
6. What effect does pulling on the front risers have on the canopy?
   拉动前组提带对降落伞有什么影响？
7. When performing front riser maneuvers, what should you do with the toggles?
   操作前组提带进行机动时，应该如何使用刹车棒？
8. What are the two biggest dangers of front-riser maneuvers near the ground?
   靠近地面的前组提带机动的最大的两个危险是什么？
9. What are some of the possible results of a turn made too low to the ground?
   转向时离地太近可能产生的一些结果是什么？
10. Describe your procedure for landing in water.
    请描述水降程序。
11. What is the maximum percentage of visible wear allowable on a main closing loop?
    主伞关包绳允许的最大可见磨损百分比是多少？
12. Can a jump be legally made from an aircraft without an operating radio?
    在没有无线电通信的情况下，从飞机上跳下是否合法？
13. What is the least notification the FAA requires before any jump or series of jumps may be made?
    联邦航空局对提交一次或一系列跳伞作业的跳伞通知的最低要求是什么？
14. Where can a pilot look to determine if a plane is approved for flight with the door removed?
    飞行员应查看什么信息，以确定一架飞机是否被批准在舱门被拆除的情况下飞行？
15. Whose name will the FAA require when filing a notification for parachute jumping?
    在向联邦航空局递交跳伞通知时需要提交谁的名字？

第五章 一般性建议

General Recommendations

SECTION SUMMARY「章节摘要」

This section of the SIM provides USPA recommendations for skydiving that apply to all jumpers, regardless of discipline or experience. USPA updates them as equipment and techniques change.
手册的这一部分提供了 USPA 对跳伞的建议，适用于所有的跳伞者，不管经验水平如何或跳伞科目是什么。当装备和相关技术发生变化时，USPA 会对内容进行更新。

Experience shows that proficiency in any skill depends on how often the skill is exercised, especially with skills that require presence of mind, coordination, sharpness of reflexes, and control of emotions.
经验表明，任何技能的熟练程度都取决于技能的运用频率，尤其是那些需要头脑清醒、协调、反应敏捷和控制情绪的技能。

IMPORTANT REFERENCE NUMBERS「重要参考内容指引」

- skydiving emergencies—5-1
  跳伞紧急情况 5-1
- currency training (according to experience)—5-2
  复训（根据经验水平） 5-2
- RSLs and AADs—5-3.F and G
  RSL 和 AAD 5-3.F 和 G
- pre-jump checklist—5-4.C
  跳前检查表 5-4.C
- hazardous weather for jumpers—5-5.B
  跳伞危险天气 5-5.B
- aircraft—5-6
  飞机 5-6
- spotting—5-7
  看点定位 5-7

WHO NEEDS THIS SECTION?「谁需要这部分」

- all active skydivers
  所有近期在跳伞的跳伞者
- instructors preparing to conduct currency training (Section 5-2)
  准备进行复训的教练（第 5-2 节）
- all jumpers studying for USPA license examinations
  所有参加 USPA 执照考试的跳伞者

5-1 跳伞紧急情况 Skydiving Emergencies

A. PRACTICE EMERGENCY PROCEDURES「紧急程序练习」

1. Regular, periodic review, analysis, and practice of emergency procedures prepares you to act correctly in response to problems that arise while skydiving.
   有规律地、定期地复习、分析并练习紧急程序，能让跳伞者准备好在跳伞中遇到问题时做出正确处理。
2. Annually review all parachute emergency procedures in a training harness.
   每年都应该使用训练背带复习所有的降落伞紧急程序。
3. Long lay-offs between jumps not only dull skills but heighten apprehensions.
   如果两次跳伞间隔时间过长，不仅技能会变得迟钝，而且恐惧感也会增加。
4. Before each jump, review the procedures to avoid emergency situations and the procedures to respond to emergencies if they occur.
   每次跳伞前都应复习避免紧急情况发生的程序，以及发生紧急情况时的应对程序。
5. Practice your reserve emergency procedures on the ground at every reserve repack.
   每次重新叠备伞前，在地面练习备伞紧急程序。
   a. Simulate some type of main malfunction on the ground, then cut away and deploy the reserve.
      在地面模拟某种主伞故障，然后切伞并开备伞。
   b. This practice will provide you first-hand knowledge about the potential pull forces and direction of pull on your gear.
      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。

B. PREVENTION AND PREPARATION「预防和准备」

1. Proper preparation and responsible judgment greatly reduce the probability of encountering an emergency situation, but even with the most careful precautions emergencies may still occur from time to time.
   适当的准备和负责任的判断大大降低遇到紧急情况的可能性，但即使采取最谨慎的预防措施，紧急情况仍可能偶尔会发生。
2. Skydiving is made safer by always anticipating and being prepared to respond to the types of emergencies that may arise.
   通过持续预期紧急情况的发生并为可能出现的各种紧急情况做准备，跳伞可以变得更加安全。
3. Failure to effectively deal with an emergency situation is one of the greatest causes of fatal incidents in skydiving.
   未能有效地处理紧急情况是跳伞时发生致命事故的最常见原因之一。
4. Safety results from reducing risk by doing the following:
   通过采取以下措施，跳伞者可以减少风险并提高安全性：
   a. Acquiring accurate knowledge.
      学习准确的知识。
   b. Jumping only in suitable conditions.
      只在合适的条件下跳伞。
   c. Evaluating the risk factors.
      评估风险因素。
   d. Knowing your personal limitations.
      了解个人局限。
   e. Keeping your options open.
      保持对各种选项的开放态度。

C. TAKE ACTION「采取措施」

1. Deploy the parachute.

开伞。

a. Open the parachute at the correct altitude.
在正确的高度开伞。

b. A stable, face-to-earth body position improves opening reliability but is secondary to opening at the correct altitude.
稳定的腹飞姿势可以提高开伞的可靠性，但更重要的是在正确的高度开伞。

2. Promptly determine if the canopy has properly opened.
及时确认降落伞是否正常打开。

3. Perform the appropriate emergency procedures and open the reserve parachute if there is any doubt whether the main canopy is open properly and controllable.
如果不能完全确定主伞是否已正常打开并可控，则跳伞者应执行适当的紧急程序并打开备伞。

4. Land in a clear area—a long walk is better than landing in a hazardous area.
在空旷的地方着陆——长距离的步行比在危险的地方着陆要好。

5. Land safely—land with your feet and knees together in preparation for performing a PLF (parachute landing fall) to avoid injury.
安全着陆——保持双脚和膝盖并拢，为执行 PLF 做准备，以避免受伤。

D. AIRCRAFT EMERGENCIES「飞机紧急情况」

1. Each skydiving center should establish and review procedures for all possible aircraft emergencies.
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处理程序。

2. Every pilot and non-student jumper should thoroughly understand these procedures.
每位飞行员和非学生跳伞者都应彻底了解这些程序。

3. All students should take direction from their instructor(s).
所有的学生都应向教练寻求指示。

E. EQUIPMENT EMERGENCIES「装备紧急情况」

PARACHUTE MALFUNCTIONS (GENERAL)「降落伞故障（一般）」

1. The majority of all malfunctions can be traced to three primary causes:
大多数故障都源于三个主要原因：

a. poor or unstable body position during parachute deployment
开伞时身体姿势不良或不稳定

b. faulty equipment
装备故障

c. improper or careless packing
叠伞不当或粗心的叠伞

2. Malfunction procedures
故障处理程序

a. Refer to Category A of the Integrated Student Program for specific, basic procedures for dealing with parachute malfunctions.
请参阅综合学生计划的 A 单元以了解降落伞故障的具体和基本处理程序。

b. In addition, other procedures are discussed in this section for licensed jumpers who may need to adjust procedures to accommodate different techniques, equipment, and personal preferences.
此外，本节还讨论有执照的跳伞者使用的其他程序，这些跳伞者可能需要调整程序以适应他（她）们不同的技能、装备和个人倾向。

3. All malfunctions can be classified as one of two types:
所有故障可分为两类：

a. total malfunction (parachute not activated, or activated but not deploying)

完全故障（不能启动降落伞，或启动了降落伞但它没有从伞包里出来）

b. partial malfunction (parachute deployed but not landable):
部分故障（降落伞从伞包里出来了，但不能用于正常着陆）：

4. You should decide upon and take the appropriate actions by a predetermined altitude that should be no lower than:
应在预定的高度以上决定采取适当的行动并实施这个决定：

a. Students and A-license holders: 2,500 feet.
学生和 A 执照持有者：决断高度不低于 2500 英尺。

b. B-D license holders: 1,800 feet.
B 至 D 执照持有者：决断高度不低于 1800 英尺。

5. Reserve activation「打开备伞」

a. Reserve pilot chutes are manufactured with a metal spring in the center, which adds weight to the reserve pilot chute.
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。

b. During a stable, belly-to-earth reserve deployment, the reserve pilot chute can remain in the jumper's burble for several seconds, delaying the reserve deployment.
采取稳定的腹部朝下的身体姿势打开备伞时，备伞引导伞可能会在跳伞者上方的涡流中停留几秒钟，从而延迟备伞的打开。

c. Immediately after pulling the reserve ripcord, look over your right shoulder while twisting your upper body upwards to the right, or sit up in a slightly head-high orientation, in order to change the airflow behind your container to help the reserve pilot chute launch into clean air.
拉动备伞开伞拉索后，应立即让视线越过右肩膀看，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。这样有助于备伞引导伞在通畅的（无涡流的）气流中释放。

d. Most harness and container manufacturers secure the steering toggles to reserve risers using Velcro, which will firmly hold the toggle in place. Be sure to peel the Velcro before attempting to pull the toggles free from the risers to release the brakes.
大多数背带和伞包制造商使用魔术贴将刹车棒固定在备伞组提带上，使刹车棒牢牢地固定好。在尝试将刹车棒与组提带分开以释放刹车棒前，一定要剥离魔术贴。

TOTAL MALFUNCTION「完全故障」

1. Identification「辨别」

a. A total malfunction includes deployment handle problems (unable to locate or extract the main parachute deployment handle), pack closure, and a pilot chute in tow.
完全故障包括开伞把手的问题（无法找到或拉出主伞开伞把手）、无法打开伞包，以及引导伞拖拽的情况。

b. If altitude permits, the jumper should make no more than two attempts to solve the problem (or a total of no more than two additional seconds).
如果高度允许的话，跳伞者应不超过两次尝试解决问题（或在累计不超过两秒钟的额外时间内解决）。

2. Procedures:「处理程序：」

a. In the case of no main pilot chute deployment (e.g., missing or stuck handle, ripcord system container lock), 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、拉索系统的伞包锁死），则应开备伞。

b. hand-deployed pilot chute in tow malfunction procedures (choose one):
使用手抛式开伞时，引导伞拖拽的故障处理程序如下（选择其中一个）：

(1) For a pilot-chute-in-tow malfunction, there are currently two common and acceptable procedures, both of which have pros and cons.
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。

(2) An instructor should be consulted prior to gearing up, and each skydiver should have a predetermined

course of action.
在穿上装备之前，跳伞者应咨询教练，每个跳伞者都应有一个预定的行动方案。

PILOT CHUTE IN TOW PROCEDURE 1:「引导伞拖拽，处理程序 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 valuable time and altitude could be lost by initiating a cutaway prior to deploying the reserve. Be prepared to cutaway.
立即拉动备伞把手。引导伞拖拽故障的同时跳伞者的下降速率很高，需要立即采取措施。主伞与备伞缠绕在一起的机会很小，在开备伞之前切伞可能会浪费宝贵的时间和高度。但也为切伞做准备。

PILOT CHUTE IN TOW PROCEDURE 2:「引导伞拖拽，处理程序 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.
切伞，然后立即开备伞。因为主伞有可能在开备伞的过程中打开或由于备伞的打开而打开，所以在某些情况下，切伞可能是最好的处理措施。

(3) In some cases, the parachute system used for the jump will require specific procedures that must be followed to reduce the chances of a main/reserve entanglement if the main canopy deploys after the reserve parachute is deployed. Check with the manufacturer of your harness and container for any specific procedures.
在某些情况下，跳伞时所使用的降落伞系统会要求必须遵循特定的程序，以减少开备伞后主伞也被打开，主伞与备伞缠绕在一起的概率。请向背带和伞包的制造商咨询任何具体程序。

PARTIAL MALFUNCTION「部分故障」

1. Identification: A partial malfunction is characterized by deployment (removal from the container) or partial deployment of the main parachute and includes, horseshoe (the container is open but the parachute is not properly deployed because something is snagged on the system), bag lock, streamer, line-over, line pressure knots, major (unlandable) canopy damage, and other open-canopy malfunctions.
辨别：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。部分故障包括马蹄铁故障（伞包已打开，但由于降落伞系统钩缠住一些东西而未正确展开）、D 包锁死、降落伞完全不充气、线翻越、伞绳张力结、程度严重（以致不能安全着陆）的降落伞损坏，以及其他打开的降落伞的故障。
2. Procedure: The recommended procedure for responding to partial malfunctions is to cut away the main parachute before deploying the reserve.
处理程序：应对部分故障的建议的处理程序是切断主伞然后开备伞。
3. At some point during descent under a partial malfunction, it becomes too low for a safe cutaway and you must deploy the reserve without cutting away.
发生部分故障情况时，在降落伞下降过程中的某个时刻，高度可能变得太低以致无法安全切伞，此时跳伞者必须在不切伞的情况下开备伞。
4. Consider the operating range of the automatic activation device when determining your personal malfunction response altitudes.
在确定要在什么高度处理故障时，应注意 AAD 的工作范围。
5. Spinning main parachute malfunctions can lose altitude significantly faster and require a rapid response. Checking your altitude more frequently is required to ensure cutting away the main parachute and deploying the reserve is done above your decision altitude.
主伞螺旋下降的故障可能会导致高度快速损失，需要快速处理。应更频繁地检查高度，以确保能在切伞决断高度以上切断主伞并开备伞。

PREMATURE MAIN CONTAINER OPENING「主伞伞包意外过早打开」

1. With a throw-out main pilot-chute deployment system (pilot chute deployment prior to closing pin extraction), the container can open before the pilot chute is deployed, causing one type of horseshoe malfunction.

对于抛出式主伞引导伞开伞系统（在拉出关包针前释放引导伞），在释放引导伞前伞包可能会被打开，导致马蹄铁故障的其中一种。

2. Prevention「预防措施」
   a. good equipment and closing system maintenance
      良好的装备和关包系统维护
   b. careful movement in the aircraft and during climbout and exit
      在飞机上、爬出机舱和出舱时动作要小心
   c. avoiding jumper contact that involves the main closing system
      避免其他跳伞者触碰到自己的主伞关包系统
3. Upon discovery that the main container has opened, the recommended response is as follows:
   当发现主伞伞包已被打开时，建议的处理方案如下：
   a. First, attempt to deploy the main pilot chute for no more than two tries or two seconds, whichever comes first.
      首先，尝试释放主伞引导伞，但不能超过两次尝试或两秒钟的时间，以先到者为准。
   b. Failing that, cut away and deploy the reserve.
      如果无法做到上述措施，则需要切伞并开备伞。
   c. Out-of-sequence pilot-chute extraction:
      顺序错乱的引导伞释放：
      (1) On systems with a bottom-of- container mounted pilot chute, premature extraction of the bag prior to pilot-chute deployment may make the pilot chute difficult to locate and extract.
      对于安装在伞包底部的引导伞，在引导伞释放前，伞包意外过早打开可能会使引导伞难以被找到和拉出。
      (2) On any throw-out hand-deployed system, the pilot chute should be capable of extraction by the jumper or from tension on the main bridle caused by the deployed parachute in the event of this type of malfunction.
      在任何抛出式的手抛式开伞系统中，在发生此类故障时，引导伞应能够被跳伞者释放，或被打开的降落伞作用在主伞引导伞系带上的拉力拉出。

TWO CANOPIES OUT「两个降落伞（主伞和备伞）同时打开的情况」

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。

1. 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两个降落伞（主伞和备伞）同时打开，并产生以下结果之一。
2. One canopy inflated, another deploying
   一个降落伞已打开充气，另一个在打开
   a. Attempt to contain the deploying reserve or main canopy and stuff it between your legs.
      尝试收住正在打开的备伞或主伞，并将其塞入两腿之间夹住。
   b. If the second canopy deployment is inevitable and there is sufficient altitude, disconnect the reserve static line and cut away the main.
      如果第二个降落伞的打开不可避免，并且还有足够的高度，应断开 RSL，然后切断主伞。
   c. If the second deployment is inevitable and there is insufficient altitude for a cutaway, wait for inflation of the second canopy and evaluate the result.
      如果第二个降落伞的打开不可避免，并且没有足够的高度切伞，则应等到第二个降落伞充气，然后评估结果。
      (1) The two open canopies typically settle into one of three configurations, biplane, side-by- side, or

downplane.
主伞和备伞同时打开后通常会形成以下三种情况之一：两伞一前一后的情况、两伞一左一右紧贴的情况或主伞和备伞分处两边的情况。

(2) Trying to force one configuration into a more manageable configuration is typically futile and can be dangerous.
试图将一种情况强行转换为另一种更易于控制的情况通常是徒劳的，而且可能是危险的。

3. Stable biplane「稳定的两伞一前一后的情况」
   a. Unstow the brakes on the front canopy or leave the brakes stowed and steer by pulling on the rear risers and recover gently to full flight.
   释放前伞的刹车棒，或者不释放刹车棒，通过拉动前伞后组提带来转向，然后轻轻地恢复到全速飞行。
   b. Leave the brakes stowed on the rear canopy.
   后伞的刹车棒不应释放。
   c. Steer the front canopy only as necessary to maneuver for a safe landing.
   仅在必要时操纵前伞，以便确保安全着陆。
   d. Use minimal control input as necessary for landing.
   根据需要，使用尽量少的控制输入，以进行着陆。
   e. Perform a parachute landing fall.
   执行 PLF。
4. Stable side-by-side (choose one procedure):
   稳定的两伞一左一右紧贴的情况（选择其中一个程序）：

SIDE-BY-SIDE PROCEDURE 1:「两伞一左一右紧贴的情况，处理程序 1：」

If both canopies are flying without interference or possibility of entanglement and altitude permits:
如果两个降落伞都无干扰或无缠绕的可能性，并且高度允许的话：

(1) Disconnect the reserve static line.
断开 RSL。

(2) Cut away the main and steer the reserve to a normal landing.
切断主伞，操纵备伞正常着陆。

SIDE-BY-SIDE PROCEDURE 2:「两伞一左一右紧贴的情况，处理程序 2：」

Land both canopies.
带着两个打开的降落伞（主伞和备伞）着陆。

(1) Disconnect the reserve static line if altitude permits.
断开 RSL。

(2) Release the brakes of the dominant canopy (larger and more overhead) and steer gently with the toggles, or leave the brakes stowed and steer by pulling on the rear risers.
释放占主导地位的伞（面积较大、方位更接近头顶上方的伞）的刹车棒，通过刹车棒轻轻地控制转向，或不释放刹车棒，通过拉动该伞的后组提带来转向。

(3) Land without flaring and perform a parachute landing fall.
降落时不要拉平，并执行 PLF。

5. Downplane or pinwheel (canopies spinning around each other)
   主伞和备伞分处两边的情况，或形象地称为“风车”（两个降落伞互相螺旋下坠）
   a. Disconnect the reserve static line if altitude permits.
   如果高度允许的话，断开 RSL。
   b. Cut away the main canopy and steer the reserve to a normal landing.
   切断主伞，操纵备伞正常着陆。
6. Main-reserve entanglement
   主伞与备伞缠绕在一起
   a. Attempt to clear the problem by retrieving the less-inflated canopy.

尝试通过收回充气和打开程度较小的降落伞来解决问题。

b. Perform a parachute landing fall.
执行 PLF。

F. LANDING EMERGENCIES「着陆紧急情况」

WATER LANDINGS「水降」

1. Procedures for an unintentional water landing:
意外水上降落的处理流程：
   a. Continue to steer to avoid the water hazard.
   继续控制转向以避免危险水域。
   b. Activate the flotation device, if available.
   激活漂浮装置（如有）。
   c. Loosen the chest strap to facilitate getting out of the harness after landing in the water.
   松胸带，以便在水上降落后脱掉背带。
   d. Disconnect the reserve static line (if applicable) to reduce complications in case the main needs to be cut away after splashing down.
   断开 RSL（如适用），以减少落水后如需切断主伞时的困难。
   e. Flare to half brakes at ten feet above the water (this may be difficult to judge, due to poor depth perception over the water).
   在水面以上 10 英尺处时拉平到半刹车位置（因为水面上的深度视觉差，高度可能很难判断）。
   f. Prepare for a PLF, in case the water is shallow (it will be nearly impossible to determine the depth from above).
   准备做 PLF，以防备水深很浅的情况（从水面以上几乎无法确定水的深度）。
   g. Enter the water with your lungs filled with air.
   落水之前深吸气。
   h. After entering the water, throw your arms back and slide forward out of the harness.
   落水后，手臂应先后置，然后再向前穿出背带。
      (1) Remain in the harness and attached to the canopy until actually in the water.
      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（不能提前切伞）。
      (2) If cutting away (known deep water only), do so only after both feet contact the water.
      如果需要切伞（仅限于已明确知道在深水区的情况），则必须在双脚接触水后再做。
      (3) If flotation gear is not used, separation from the equipment is essential.
      如果不使用飘浮装置的话，则必须与装备分离。
      (4) The container can also serve as a flotation device if the reserve canopy is packed in the container.
      如果备伞装在伞包中，则伞包也可以作为漂浮装置。
      (5) Caution must be used to avoid the main canopy suspension lines if the reserve container is used for flotation.
      如果以备伞伞包作为漂浮装置，则必须小心避开主伞伞绳悬挂线。
      (6) Tests have shown that a container with a packed reserve will remain buoyant for up to 45 minutes or longer.
      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。
   i. Dive deep and swim out from under the collapsed canopy.
   下潜入深处，从塌缩的降落伞下游出来。
   j. If covered by the canopy, follow one seam to the edge of the canopy until clear of it.
   如果位于伞下面，沿着伞缝游动，直到从伞下面出来。
   k. In swift or shallow water, pull one toggle in or cut away if under the main canopy.
   在急流或浅水中，如果位于主伞下面，拉下一个刹车棒或切断主伞。
   l. Refill your lungs at every opportunity.

抓住每一次可以呼吸的机会。

m. Swim carefully away upwind or upstream to avoid entangling in the suspension lines.
小心地逆风或逆流游走，以免缠绕在伞绳悬挂线上。

n. Remove any full coverage helmets in the event of breathing difficulties.
在呼吸困难的情况下，摘下任何全盖式头盔（全盔）。

2. If using the Air Force type (LPU) underarm flotation equipment—
如果使用空军型（LPU）臂下漂浮装置，请注意如下事项—

a. Although worn underneath, the bladders inflate outside the harness, so removal of the harness is not practical without first deflating the bladders.
虽然穿在臂下，但气囊会在背带外面充气，因此如果不先给气囊放气，脱下背带是不实际的。

b. If you must remove the harness after landing, the bladders should be deflated, extricated from the harness, and reinflated (orally) one at a time.
如果落水后必须脱下背带，则应先给气囊放气，从背带中抽出，然后重新充气（用嘴吹气），一次只能给一侧气囊充气。

3. The risks of a water landing are greatly increased when a jumper wears additional weights to increase fall rate.
当跳伞者为了增加下降速率而穿上配重时，水上降落的危险就会大大增加。

4. Camera flyers, skysurfers, and other skydivers carrying additional equipment on a jump need to plan their water landing procedures accordingly.
跳伞摄影者、滑板跳伞者和其他携带额外装备的跳伞者需要相应地计划在水上降落的程序。

5. Water temperature must always be a consideration
水温必须始终被考虑在内

a. Water temperatures below 70 degrees Fahrenheit can severely limit the amount of time a person can survive while trying to tread water or remain afloat.
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。

b. Treading water or swimming will cause the body to lose heat more rapidly, because blood moves to the extremities and is then cooled more rapidly.
踩水或游泳会使身体更快地失去热量，因为血液流向四肢，然后身体就冷却得更快。

c. Depending on the situation, it may be better to try to float rather than swim or tread water while waiting for help to arrive.
视情况而言，等待救援时可能最好尝试漂浮在水上，而不是游泳或踩水。

6. Other references「其他参考资料」

a. SIM Section 2-1, USPA Basic Safety Requirements on water jumping equipment
SIM 2-1 中 USPA 关于水降装备的基本安全要求。

b. SIM Section 6-5, Water Landing Recommendations (unintentional and intentional).
SIM 6-5 中关于水上降落的建议（意外水降和刻意水降）。

POWER LINES「高压线」

1. Power lines present a serious hazard to all aviators; know where they are near your DZ.
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。

2. Identify power lines in the landing area as early as possible and steer to avoid them.
尽早辨清降落区的高压线并转弯避开它们。

3. If a low turn is necessary to avoid a power line:
如果需要低转以避开高压线：

a. Make the minimum, flat, braked turn necessary to miss the line.
进行必要的最小量的、平缓的带刹车转向，以避开高压线。

b. Execute a braked landing and flare.
从刹车状态开始拉平着陆。

c. Prepare for a hard landing (PLF).
准备硬着陆（执行 PLF）。

4. If a power line landing is unavoidable:
如果着陆在高压线上不可避免：
   a. Drop any ripcords or other objects.
   扔掉任何降落伞拉索或其他物体。
   b. Bring a ram-air canopy to slow flight.
   使用冲压空气式降落伞减缓飞行速度。
   c. With a round canopy, place your hands between the front and rear risers on each side.
   使用圆形伞时，把手放在两边的前后组提带之间。
   d. Prepare for a PLF with your feet and knees tightly together and turn your head to the side to protect your chin.
   准备执行 PLF，脚和膝盖并拢，把头转向一边，以保护下巴。
   e. Land parallel to the power lines.
   在与高压线平行的方向着陆。
   f. Do not touch more than one wire at a time.
   一次只能接触一根电线。
   g. If suspended in the wires:
   如果悬挂在电线上：
      (1) Wait for help from drop zone and power company personnel; nylon conducts electricity at higher voltages.
      等待跳伞基地和电力公司工作人员的协助；尼龙在较高电压下是导电的。
      (2) Verify only with the power company that electrical power is off and will stay off.
      仅电力公司可以确认电源已切断并且将保持切断状态。
      (3) 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.
      如果控制配电的计算机检测到线路有故障，计算机控制的重启可能会尝试在没有警告的情况下重新打开电源。

TREES「树降」

1. Avoid trees by careful spotting and a good approach pattern plan for the conditions.
通过仔细地看点定位和根据情况制定合适的进近航线来避开树木。
2. The potential dangers of landing in a tree extend until you are rescued and safely on the ground.
只有跳伞者获救并安全回到地面上时，树降的潜在危险才结束。
3. Make any low-altitude avoidance turns from braked flight to avoid an equally dangerous dive following a turn from full flight.
如有必要，从带刹车飞行的状态开始进行低空转弯以避开树木，从而避免同样危险的、全速飞行状态下转弯后导致的俯冲。
4. If a tree landing is unavoidable:
如果不可避免降落在树木上，则采取如下措施：
   a. With a ram-air canopy, hold the toggles at half brakes until tree contact.
   在使用冲压空气式降落伞时，应将刹车棒拉到半刹车位置并保持，直到接触树木。
   b. Prepare for a PLF; often the jumper passes through the tree and lands on the ground.
   准备 PLF；通常跳伞者会穿过树木并着陆在地面上。
   c. Protect your body.
   保护好身体。
      (1) Keep feet and knees tightly together.

双脚和膝盖并拢

(2) Do not cross your feet or legs.
双脚或腿注意不要交叉。

(3) Cover your face with your hands while holding your elbows tightly against your stomach.
用双手保护脸，两个手肘紧紧抵住胸腹部。

d. Steer for the middle of the tree, then hold on to the trunk or main branch to avoid falling.
试着对准树的中间，然后抱住树干或主要枝干，以免摔下去。

e. If suspended above the ground, wait for help from drop zone personnel to get down.
如果悬挂在地面上方，呆在树上等待跳伞基地工作人员来救援，以从树上下去。

f. Don't attempt to climb down from a tree without competent assistance (rescue personnel or properly trained drop zone staff).
在没有有能力的人（救援人员或受到适当培训的跳伞基地工作人员）来救援的情况下，不要试图从树上爬下去。

BUILDINGS AND OTHER OBJECTS「在建筑物和其他障碍物上降落」

1. Plan your landing approach to be well clear of objects.
规划好着陆进近，以远离障碍物。
2. Fly far enough from objects that another jumper or your own misjudgment does not force you into a building or other hazardous object.
应飞得离障碍物足够远，从而避免因自己的错误判断或因其他跳伞者而被迫在建筑物或其他危险障碍物上着陆。
3. Focus on clear, open landing areas and steer the parachute to a clear area.
把注意力集中在空旷开阔的着陆区域，控制降落伞飞向无障碍物的区域。
4. Make any low-altitude avoidance turns from braked flight to avoid an equally dangerous dive following a turn from full flight.
如有必要，从带刹车飞行的状态开始进行低空转弯以避开障碍物，从而避免同样危险的、全速飞行状态下转弯后导致的俯冲。
5. If landing on a building or object cannot be avoided, prepare for a PLF.
如果不可避免降落在建筑物或障碍物上，则准备 PLF。
6. Flare at ten feet above the first point of contact with the building or object.
在与建筑物或障碍物的第一次接触点上方 10 英尺处拉平。
7. Strike the object feet first, whether landing on top or into the side of the object.
用脚先接触，无论是在障碍物上面还是侧面。
8. After landing on top of an object in windy conditions:
在有风的情况下，在障碍物顶部着陆后：
   a. Disconnect the reserve static line (if possible) and cut away the main parachute.
   断开 RSL（如果可能的话）并切断主伞。
   b. If landing with a reserve, retrieve and contain the canopy until removing the harness.
   如果使用备伞着陆，则收回并控制住备伞，直到脱下背带。
   c. Wait for competent help.
   等待有能力的人来救援。

OFF-FIELD LANDINGS「场外降落」

1. Jumpers prefer to land in the planned area, which is usually familiar and free of obstacles; however, circumstances might make that difficult or impossible:
跳伞者一般着陆在计划好的着陆区域，这些区域通常是跳伞者所熟悉的，没有障碍物的区域；但在一些情况下，降落在预定区域可能会变得很困难，甚至不可能，导致这种情况的原因可能如下：
   a. spotting error

看点定位失误

b. unexpected wind conditions
超出预期的风况

c. inadvertent high opening
意外的高空开伞

d. low opening, especially under a reserve canopy
低空开伞，尤其是使用备伞时

2. Problems resulting from less-than-ideal opening positions over the ground have resulted in injuries and fatalities for students and experienced jumpers:
相对地面位置不太理想的开伞点所导致的问题（如下所列）曾导致学生乃至资深跳伞者受伤和死亡：

a. intentional low turns into an unfamiliar landing area
故意低转到陌生着陆区域

b. unplanned low turns trying to avoid obstacles
计划外的低转，以试图避开障碍物

c. 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

d. 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，并在这个过程中犯下错误

3. Avoiding off-field landings
应采取以下措施避免场外降落

a. Know the correct exit point for the current conditions.
知道当前条件下的正确出舱点。

b. Once at the door of the aircraft, check the spot before exiting and request a go-around if necessary.
一旦到达飞机舱门，应在出舱前检查点位，如果必要的话，应要求飞机再飞一圈。

c. In freefall, check the spot soon after exit and adjust opening altitude if necessary and safe to do so, considering the following:
在自由落体状态下，在出舱后立即检查点位，如有必要，可在确认安全的情况下调整开伞高度，考虑因素如下：

(1) other groups or individuals in freefall nearby
附近是否有其他自由落体的团体或个人

(2) jumpers from other planes (multiple-plane operations)
是否有来自其他飞机的跳伞者（多架飞机的跳伞作业）

4. If an off-field landing cannot be avoided:
如果无法避免场外降落：

a. Do not waste altitude trying to reach the main landing area when a viable alternative is available.
当有可行的替代方案时，不要浪费高度试图到达主着陆区。

b. Decide on a viable alternative landing area based on your current location and the wind speed and direction.
根据当前的位置、风速和风向，确定一个可行的备降场。

c. Plan a descent strategy and landing pattern for the alternative landing area.
为备降场规划降落伞下降策略和着陆航线。

d. Check the alternative landing area carefully for hazards while still high enough to adjust the landing pattern to avoid them.
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。

(1) When checking for power lines, it is easier to see the poles and towers than the wires themselves.
寻找高压线时，找电线杆和电线塔比发现电线本身更容易。

(2) Determine the wind direction to predict turbulence created by trees or other obstacles, and plan a landing spot accordingly.
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。

(3) Fences and hills may be difficult to see from higher altitudes.
从较高的高度可能难以看到围栏和小丘。

(4) Fences and power lines often form straight lines along the ground
围栏和高压线常沿地面呈直线状。

5. Canopy control「降落伞控制」
   a. A braked approach and braked turns allow for the canopy to be flown at a slower forward speed and descent rate but may lengthen the approach glide.
   带刹车进近和带刹车转向可使降落伞以较慢的前进速率和下降速度飞行，但可能延长进近滑翔距离。
   b. Altitude-conserving braked turns may be necessary to avoid an obstacle.
   为了避免障碍物，可能需要带刹车转向以减少高度损失。
   c. A braked turn at a low altitude may not allow enough time for recovery to full flight in time for a landing flare, and a jumper may need to make a braked landing.
   低空的带刹车转向可能没有足够的时间恢复到全速飞行状态然后再拉平，因此可能需要在刹车状态下开始拉平着陆。
   d. Jumpers should practice braked turns and approaches often to prepare for this eventuality.
   跳伞者应该经常练习带刹车转向和进近，以为这种可能发生的事做好准备。
6. Returning from a long distance:
   长距离飞回：
   a. Flying a long distance in high winds can disorient a jumper for altitude awareness and could lead to a low turn.
   在大风中长距离飞行会影响跳伞者对高度的判断，并可能导致低转。
   b. High winds at higher altitudes typically diminish near the ground and should not be counted on to carry a jumper over an obstacle or hostile landing area.
   高空的大风在接近地面时通常会减弱，因此不应该指望大风带着跳伞者越过障碍物或不适宜着陆的区域。
   c. A jumper attempting to return from a long distance should keep alternatives in mind along the way and begin an approach into a clear area by 1,000 feet.
   试图从长距离飞回的跳伞者应在飞行的同时也准备好执行备用方案，并在 1000 英尺以上开始向空旷区域进近。
   d. Landing into the wind is desirable, but not at the risk of a low turn.
   逆风降落是好的，但不要冒着低转的风险逆风降落。
   e. In any off-field landing, a parachute landing fall is a good defense against injury from unknown surface and terrain.
   在任何场外降落中，PLF 是预防未知地表和地形造成伤害的好方法。
7. Jumpers must respect the property where the landing took place.
   跳伞者必须尊重降落地点的财产。
   a. Do not disturb livestock.
   勿惊扰牲畜。
   b. Leave gates as they were found.
   所有的大门，原来是什么样，离开后都弄回原样。
   c. Avoid walking on crops or other cultivated vegetation.
   避免在庄稼或其他种植作物上走。
   d. property damage
   财产损失
      (1) Report any property damage to the property owner and make arrangements for repairs.

向土地所有者报告任何财产损失并安排修理。

(2) USPA membership includes insurance for such situations.
USPA 的会员会籍包含了此类情况的保险。

G. FREEFALL COLLISIONS「自由落体相撞」

1. A collision danger faces jumpers exiting in a group or on the same pass when they lose track of each other.
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。
2. Differential freefall speeds may reach upwards of 150 mph horizontally and vertically in combination.
在水平和垂直方向上的自由落体合速度差可以达到 150 英里/小时以上。
3. Jumpers must take precautions to prevent a collision with freefalling jumpers during and after opening.
跳伞者必须采取预防措施，以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。

H. CANOPY COLLISIONS「降落伞相撞」

1. The best way to avoid a collision is to know where other canopies are at all times.
避免碰撞的最好方法是随时掌握其他降落伞的位置。
2. 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.
大多数降落伞碰撞发生在两名距离近的跳伞者开伞后不久，或在高度 1000 英尺以下在着陆航线上飞行时。
3. Higher break-off altitudes, better planning and tracking farther can help ensure clear airspace during deployment.
更高的分离高度、更好的规划和飞行距离更远的 Tracking 有助于确保开伞期间的空域畅通。
4. Remaining vigilant throughout the canopy descent and always looking in the direction of the turn before initiating it can help to identify and avoid other canopies during the descent.
在整个降落伞下降过程中保持警惕，且在转向之前始终先看向要转向的方向，这有助于在下降过程中辨识和避开其他降落伞。
5. If approaching a jumper head on, both canopies should steer to the right unless it is obvious that steering left is necessary to avoid the collision (both jumpers are more offset towards the left).
迎面接近一名跳伞者时，两名跳伞者都应该向右转向，除非明显需要向左转向以避免碰撞（两名跳伞者明显更靠自己的左边飞行，即对方明显靠自己右方飞行时）。
6. If a collision is inevitable:
如果碰撞不可避免：
   a. Protect your face and operation handles.
   保护好脸和操作把手。
   b. Tuck in your arms, legs and head for protection against the impact.
   收起双臂，双腿和头，以在撞击中保护好自己。
   c. Avoid hitting the suspension lines of the other canopy or the other jumper, if at all possible.
   如果可能的话，尽可能避免撞到另一个降落伞的伞绳或跳伞者。
   d. If a collision with the other jumper's suspension lines is unavoidable, it may be possible to spread your legs and one arm, while protecting your handles with the other arm, in order to keep from passing through the suspension lines during the collision. However, a collision at high speed with suspension lines can lead to severe cuts and burns.
   如果不可避免与另一名跳伞者的伞绳碰撞，则可能可以张开双腿和一只手臂，同时用另一只手臂保护把手，以免在碰撞过程中穿过伞绳。但高速状态下与伞绳发生碰撞可能导致严重的割伤和擦伤。
   e. Check altitude with respect to the minimum cutaway decision and execution altitude recommended for your experience.
   检查高度，注意是否到了最低切伞决断和实施高度（不同经验水平的跳伞者有不同的建议切伞决断和实施高度）。
   f. Communicate before taking action:

必须在采取进一步行动之前先传达意图：

(1) The jumper above can strike the jumper below during a cutaway unless one or both are clear or ready to fend off.
上方的跳伞者切伞时可能撞到下方的跳伞者，除非其中一方或双方都有充足的无阻碍的空间，或准备好躲避。

(2) The jumper below can worsen the situation for the jumper above by cutting away before he or she is ready.
如果下方的跳伞者在上方的跳伞者准备好之前就切伞，这会使上面跳伞者的情况恶化。

(3) If both jumpers are cutting away and altitude permits, the second jumper should wait until the first jumper clears the area below.
如果两名跳伞者都切伞并且高度允许的话，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。

(4) The first jumper should fly from underneath in a straight line after opening.
第一切伞然后开备伞的跳伞者应在下方沿着直线飞行。

(5) At some point below a safe cutaway altitude (1,000 feet), it may become necessary to deploy one or both reserves (may not be a safe option with an SOS system).
在低于安全切伞高度（1000 英尺以下）时，情况的变化可能要求其中一人打开备伞甚至两人都打开备伞（使用单把手紧急系统（SOS）时，这可能不是安全的选项）。

(6) If both jumpers are suspended under one flying canopy at a low altitude, it may become necessary to land with only that canopy.
如果两名跳伞者在低空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。

(7) Communications may be difficult if one or both jumpers are wearing full-face helmets.
如果其中一名或两名跳伞者戴着全盖式头盔（全盔），交流可能会很困难。

g. SIM Section 6-6 F. Emergency procedures contains additional recommendations about dealing with canopy entanglements.
本手册 6-6 F 中的紧急程序包含有关处理降落伞缠绕的附加建议。

I. LOW TURNS「低转」

1. Low turns under canopy are one of the biggest causes of serious injury and death in skydiving.
操作降落伞低转是跳伞运动中造成严重受伤和死亡的最常见原因之一。
2. A low turn can be premeditated or result from an error in judgment or experience with a situation.
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。
3. To avoid low turns, fly to a large, uncrowded landing area free of obstacles and—
为了避免低转，应飞到一个没有障碍物的、面积较大的、人少的着陆区，并执行如下操作—
   a. Fly a planned landing pattern that promotes a cooperative traffic flow.
   按计划着陆航线着陆，跳伞者之间互相协作，以促进的良好的交通。
   b. If landing off-field, plan a landing pattern by 1,000 feet.
   如果在场外降落，应在 1000 英尺以上规划好着陆航线。
4. Once a jumper realizes that a turn has been made at an unsafe altitude:
一旦跳伞者意识到在不安全的高度进行了转向，则应做如下：
   a. Use toggle control to get the canopy back overhead and stop the turn.
   使用刹车棒控制使降落伞回到头顶上方并停止转向。
   b. Stop the dive.
   停止降落伞的俯冲。
   c. Flare and prepare for a hard landing (PLF).
   拉平并为硬着陆做准备（PLF）。
   d. Manage the speed induced by the turn.

控制好转向所导致的速度。

(1) Expect more responsive flare control with the toggles due to the increased airspeed.
由于空速的增加，应做好预期，使用刹车棒拉平的反应会更灵敏。

(2) Expect a longer, flatter flare.
做好预期，拉平会变得更长、更平坦。

e. In case of premature contact with the ground, no matter how hard, keep flying the canopy to reduce further injury.
在过早接触地面的情况下，无论落得多重，都要继续控制降落伞飞行，以减少进一步的伤害。

5-2 复训 Currency Training

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教学内容的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「持有执照的跳伞者」

1. Skydivers returning after a long period of inactivity encounter greater risk that requires special consideration to properly manage.
   长时间不跳伞后恢复跳伞的跳伞者有较大的风险，需要特别关注以适当控制风险。
2. Care should be taken to regain or develop the knowledge, skills, and awareness needed to satisfactorily perform the tasks planned for the jump.
   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。
3. Jumps aimed at sharpening survival skills should precede jumps with other goals.
   为锻炼提升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」

1. If deployment or emergency procedures are changed at any time, the skydiver should be thoroughly trained and practice under supervision in a harness simulator until proficient.
   如果在任何时候，开伞程序或紧急程序有改变，跳伞者应接受全面的培训，并在监督下使用背带模拟器练习，直到熟练为止。
2. Ground training should be followed by a solo jump which includes several practice sequences and deployment at a higher-than-normal altitude.
   地面培训后，应进行一次单人跳伞，跳伞包含若干次程序模拟动作，并高于正常开伞高度开伞。
3. The jumper should 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.
   跳伞者应频繁重复地面练习，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 LAY-OFFS「长期没有跳伞的跳伞者」

1. Jumpers should receive refresher training appropriate for their skydiving history and time since their last skydive.
   跳伞者应接受与其跳伞经历以及上一跳到现在的间隔时间相适应的复习培训。
   a. Jumpers who were very experienced and current but became inactive for a year or more should undergo thorough training upon returning to the sport.
      曾经经验丰富的活跃跳伞者，如果在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。
   b. Skydivers who historically jump infrequently should review training after layoffs of even less than a year.
      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。
2. Skydiving equipment, techniques, and procedures change frequently.
   跳伞装备、技巧和程序经常变化。
   a. During currency training following long periods of inactivity, jumpers may be introduced to new and unfamiliar equipment and techniques.
      在长时间不跳伞后的复训中，跳伞者可能会接触到新的不熟悉的装备和技巧。
   b. Procedures change to accommodate developments in equipment, aircraft, flying styles, FAA rules, and local drop zone requirements.
      跳伞程序会发生变更，以适应装备、飞机、飞行方式、联邦航空局规定和本地跳伞降落区要求的变化发展。

3. Returning skydivers require thorough practical training in the following subject 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：
   a. aircraft procedures「飞机程序」
   b. equipment「装备」
   c. exit and freefall procedures「出舱和自由落体程序」
   d. canopy control and landings「降落伞控制和着陆」
   e. emergency procedures「紧急程序」

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，直至能够展示高度意识、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，直到证明有能力安全行使该执照的特权。

C AND D LICENSE「C 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 that license.
在 180 天内没有进行过自由落体跳伞的 USPA C 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，直到证明有能力安全行使该执照的特权。

5-3 装备 Equipment

A. FEDERAL REGULATIONS ON EQUIPMENT「关于降落伞装备的联邦法规」

1. The design, maintenance, and alteration of parachute equipment is regulated by the Federal Aviation Administration of the U.S. Department of Transportation, which publishes Federal Aviation Regulations (FARs).
   降落伞装备的设计、维护和改装由美国交通部下属联邦航空局监管，该局发布联邦航空条例（FAR）。
2. All skydivers should be familiar with the following FARs and their applicability to skydiving (see Section 9-1 and 9-2 of this manual):
   所有跳伞者应熟悉下列 FAR 条例及其在跳伞运动中的适用性（参见本手册 9-1 和 9-2）：
   a. Part 65—Certification of Parachute Riggers
      第 65 部分—降落伞装备师的认证
   b. Part 91—General Flight Rules
      第 91 部分—一般飞行规则
   c. Part 105—Parachute Operations
      第 105 部分—降落伞作业
   d. 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。
3. Approval of parachutes is granted to manufacturers in the form of Technical Standard Orders (TSOs).
   降落伞的批准认证是以技术标准规定（TSO）的形式授予制造商的。
   a. TSO C-23 is issued to parachutes that comply with the current performance standards.
      TSO C-23 签发给符合现行性能标准的降落伞。
      (1) NAS 804 for TSO C-23b
          TSO C-23b 基于 NAS 804 标准
      (2) AS-8015A for TSO C-23c
          TSO C-23c 基于 AS-8015A 标准
      (3) AS-8015B for TSO C-23d
          TSO C-23d 基于 AS-8015B 标准
   b. These standards specify the tests that must be passed for a parachute system and its component parts to receive approval for civilian use.
      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。
   c. Procedures for obtaining TSO approval for parachutes or component parts may be found in FAR Part 21 (not included in the SIM).
      降落伞或部件的 TSO 批准认证的程序，可以在 FAR 第 21 部分中（不包含在 SIM 中）找到。
4. Alterations to approved parachutes may be performed only by those who have been issued an FAA approval for the 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。
   a. Approval may be obtained by submitting a request and description of the alteration to the manufacturer or to an FAA Flight Standards District Office.
      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。
   b. The following are eligible to receive alteration approval:
      以下人员有资格获得改装批准：
      (1) FAA master rigger
          联邦航空局认证的高级降落伞装备师
      (2) manufacturer with an approved quality assurance program
          有获批准认证的质量保证程序的制造商

c. Alterations may not be performed without full documentation of FAA approval for the specific alteration.
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」

1. Jumpers should choose canopies that will provide an acceptable landing in a wide range of circumstances, based on several factors including canopy size, wing loading, planform (shape), skill level, and experience.
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。
2. Owners should verify with a rigger that all applicable updates and bulletins have been accomplished.
主伞所有者应向降落伞装备师确认所有适用于其主伞的更新和公告已完成。
3. Jumpers should observe the recommendations of the canopy manufacturer for the correct canopy size, usually listed by maximum recommended weight with respect to other factors:
跳伞者应遵守降落伞制造商关于正确选择降落伞尺寸的建议，通常根据最大建议重量以及与最大建议重量相关的其他因素列出，这些因素包括：
   a. the jumper's experience
   跳伞者的经验水平
   b. drop zone elevation
   降落区海拔
   c. other conditions, such as density altitude
   其他条件，如密度高度等
4. Wing loading, measured as exit weight in pounds per square foot (psf) provides only one gauge of a canopy's performance characteristics.
翼载根据出舱时的重量算出（单位：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。
   a. A smaller canopy at an equal wing loading compared to a larger one of the same design will exhibit a faster and more radical control response, with more altitude loss in any maneuver.
   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。
   b. Design, materials, and construction techniques can cause two equally wing-loaded canopies to perform very differently.
   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。
   c. Different planforms (square vs. elliptical) will exhibit very different handling characteristics.
   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。
5. The Minimum Canopy Recommendations chart represents the minimum recommended canopy size by exit weight and total jumps made on solo equipment with square parachutes. Canopy size for students is at the discretion of the instructor.
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。
   a. Due to the varied sizes of canopies from different manufacturers, any canopy less than 3% smaller than the listed recommendation is acceptable.
   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。
   b. Canopy choices for jumpers over 1,000 jumps is at their discretion.
   跳数超过 1000 跳的跳伞者可自行选择降落伞。
   c. These minimum canopy recommendations may be too aggressive for some jumpers and, in other cases, too conservative. Instructors, canopy coaches and drop zone leadership should assist their skydivers in selecting an appropriate canopy for their jumper's ability and progression.

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。

Minimum Canopy Recommendations 建议的降落伞面积下限

Jumps 跳数	Exit Weight (Jumper plus all equipment) 出舱重量（跳伞者加上所有装备的重量）单位：磅															
	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250
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	170
750-1000	107	120	120	120	135	135	135	135	135	135	135	150	150	170	170	170

C. RESERVE PARACHUTE「备伞」

1. All skydivers should use a steerable reserve canopy.
   所有跳伞者都应该使用可操纵的备伞。
2. The FAA requires the reserve parachute assembly, including harness, container, canopy, risers, pilot chute, deployment device, and ripcord, to be approved.
   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。
3. Jumpers must observe FARs regarding the manufacturer's maximum certificated weights and speeds for parachutes.
   跳伞者必须遵守 FAR 关于制造商获批准认证的最大重量和速度的规定。
   a. Parachutes approved under FAA Technical Standard Order C-23b, C-23c, and C-23d are subject to different testing standards and operation limits.
      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。
   b. The entire parachute system is limited to the maximum certificated load limit of the harness-and-container system or reserve canopy, whichever is less.
      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。
   c. Load limits are found in the owner's manual, the manufacturer's website, or placarded on the parachute component itself.
      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。
4. For a ram-air reserve, jumpers should not exceed the maximum suspended weight specified by the manufacturer (not necessarily the maximum certificated load limit).
   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）。
5. 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.
   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。
6. Round reserve canopy「圆形备伞」
   a. should be equipped with a deployment device to reduce the opening force and control deployment
      应配备开伞装置用以减少开伞冲击并控制开伞

b. should have a rate of descent that does not exceed 18 feet per second (fps)
下降速率不应超过 18 英尺/秒

c. must not exceed a rate of descent of 25 fps at sea level conditions (NAS 804)
在海平面条件下，下降速率不得超过 25 英尺/秒（NAS 804 标准）

d. The following scale indicates the minimum size round reserve canopy recommended for use according to the exit weight of the skydiver:
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」

1. The FAA requires the harness of a dual parachute assembly to be approved.
联邦航空局要求双降落伞系统的背带必须经过批准认证。
2. All harness ends should be folded over and sewn down or wrapped and sewn down to prevent the harness from unthreading through the hardware upon opening.
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，以防开伞时背带从金属部件中脱出。
3. Canopy release systems should be maintained according to the schedule and procedures in the owner's manual.
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。
4. It is desirable for the manufacturing industry to standardize the location of all operational controls.
从制造的角度来说，所有操作把手的位置的标准化是有益的。
5. The harness should be equipped with single-point riser releases (one handle releases both risers) for easy and rapid disengagement from the main canopy.
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。
6. Reserve ripcord handles:「备伞开伞拉索把手（备伞把手）」
   a. Loop type handles should be made of metal.
   环柄状的把手应采用金属制成。
   b. Plastic and composite reserve ripcord handles are not recommended.
   不建议使用塑料和复合材料的备伞把手。
   c. Jumpers should practice peeling and pulling pillow-type reserve ripcord handles until certain they can operate them easily in an emergency.
   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。
7. All ripcord housings ends should be secured.
所有拉索收纳管末端都应保护好。
8. Ripcord pins, when seated, should either be started inside the housing or clear the closing loop before entering the housing.
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。
（译者注：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）

9. A ripcord cable stop should not be used; fatal accidents caused by reserve entanglements with ripcords secured in this manner have been documented.
不应使用拉索限位器；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：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）
10. Reserve pilot chute:「备伞引导伞」
    a. The reserve system is usually designed to use a specific type of pilot chute.
    备伞系统通常被设计为使用特定类型的引导伞。
    b. It should be properly seated in the container and repacked if it has shifted.
    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。
11. 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棒，并收起刹车线的松弛部分，以防止刹车线缠绕和过早释放刹车棒。

E. MAIN PILOT CHUTE「主伞引导伞」

1. The main pilot chute is designed as part of the main parachute system.
主伞引导伞被设计为主伞系统的一部分。
    a. On throw-out hand-deployed systems, the pilot chute and pouch size must be compatible.
    在抛出式的手抛式开伞系统中，引导伞和引导伞收纳袋的尺寸必须兼容。
    b. Pilot chute size can affect the opening characteristics of the main canopy.
    引导伞尺寸可能会影响主伞的开伞特性。
2. Collapsible hand-deployed pilot chutes add complexity and additional maintenance requirements to the system.
可缩的、手动释放的引导伞增加了系统的复杂性，并带来了额外的维护要求。
    a. additional wear from more moving parts
    更多的移动部件会导致额外的磨损
    b. danger of a high-speed pilot-chute- in-tow malfunction if the pilot chute is not set or cocked
    如果可缩引导伞的中线没有预位好（意即 kill line 没拉好），则存在高速引导伞拖拽的危险
3. 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定。

F. RESERVE STATIC LINE(RSL)「联动装置（RSL）」

1. A reserve static line attaches to a main canopy riser to extract the reserve ripcord pin immediately and automatically after separation of the main risers from the harness.
RSL 连接到主伞组提带上，以在主伞组提带与背带分开后立即自动拉出备伞关包针。
2. An RSL is recommended for all experienced jumpers.
建议所有有经验的跳伞者都使用 RSL。
    a. The RSL backs up the jumper by extracting the reserve ripcord pin after a cutaway.
    RSL 通过在切伞后拉出备伞关包针来作为跳伞者开备伞的备份措施。
    b. the RSL—
        (1) must be routed and attached correctly to function
        线路要布好、连接正确，才能发挥作用

(2) when misrouted, can complicate or prevent a cutaway
线路没布好时，可能会使切伞情况复杂化或阻碍切伞

c. RSLs can complicate certain emergency procedures:
RSL 可能使如下紧急程序复杂化：

(1) cutaway following a dual deployment
两个降落伞（主伞和备伞）打开后进行切伞

(2) cutting away from an entanglement after a collision
降落伞碰撞后切伞以脱离缠绕

(3) unstable cutaway, although statistics show that chances are better from an unstable reserve deployment than delaying after a cutaway
不稳定状态下的切伞，尽管统计数据显示，不稳定状态下打开备伞比切伞后推迟开备伞更好

(4) unstable cutaway with a helmet camera or other protruding device
戴着头盔摄像机或其他突出设备时，在不稳定状态下切伞

(5) cutaway with a surfboard (although an RSL may have prevented two fatal skysurfing accidents)
进行空中滑板跳伞时切伞（尽管 RSL 可能成功地阻止过两起本可能致命的空中滑板事故）

(6) cutaway on the ground in high winds
在大风中在地面上切伞

(7) broken riser on the RSL side (results in reserve deployment); prevention—
RSL 一侧的组提带断裂（导致备伞的打开）；预防措施如下—

(i) inspecting and replacing worn risers
检查并更换磨损的组提带

(ii) packing for soft openings (tight line stows; see manufacturer's instructions)
良好的叠伞，以让开伞过程柔和（紧密地绑好伞绳；请参考制造商说明）

(iii) stable deployment at slow speeds
在较慢的自由落体速度下稳定开伞

d. If temporarily disconnecting an RSL, care must be taken so it doesn't interfere with the operation of the parachute system; consult a rigger.
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。

3. When using a reserve static line device, the skydiver must not depend on the static line device and must manually pull the reserve ripcord immediately after the cutaway.
使用 RSL 时，跳伞者不得依赖 RSL，并且必须在切伞后立即手动拉动备伞拉索。

4. An RSL may not be desirable when attempting linked canopy formations.
当试图建立互相连接的降落伞编队时，使用 RSL 可能是不好的。

5. Unless the manufacturer's instructions state otherwise, a connector device between the left and right main risers should not be used.
除非制造商另有说明，否则左、右主伞组提带之间的连接装置不应使用。

G. AUTOMATIC ACTIVATION DEVICE (AAD)「自动激活装置（AAD）」

1. An AAD initiates the reserve deployment sequence at a preset altitude (also sometimes used on the main parachute system).
AAD 可自动在预先设定的高度启动打开备伞的流程（有时也用在主伞系统上）。

2. An AAD is encouraged for all licensed jumpers.
建议有执照的跳伞者都使用 AAD。

3. The use of an AAD for activation of the reserve parachute, coupled with proper training in its use, has been shown to significantly increase the chances of surviving a malfunction or loss of altitude awareness.
使用 AAD 启动备伞，再加上适当的操作培训，已被证明可以大大增加在故障或失去高度意识的情况下的生存机会。

4. The AAD is used to back up the jumper's deployment and emergency procedures, but no jumper should ever rely on one.
   AAD 是跳伞者的开伞和紧急程序的备份，但任何跳伞者都不应仅依赖于 AAD。
5. The FAA requires that if an AAD is used, it must be maintained in accordance with the manufacturer's instructions (FAR 105.43.c).
   联邦航空局要求，如果使用 AAD，必须按照制造商的说明进行维护（FAR 105.43.c）。
6. Each jumper should read and understand the owner's manual for the AAD.
   每名跳伞者都应阅读并理解 AAD 的用户手册。
7. An AAD may complicate certain situations, particularly if the jumper deploys the main parachute low enough for the AAD to activate.
   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。
8. Understanding and reviewing of the emergency procedures for Two Canopies Out (SIM Section 5-1) is essential.
   理解并复习两个降落伞（主伞和备伞）同时打开的情况的紧急处理程序（SIM 5-1）是必须的。

H. STATIC LINE (MAIN)「STATIC LINE（主伞）」

1. The FAA requires static line deployment to be either by direct bag or pilot-chute assist.
   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。
   （*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*）
2. The direct bag is a more positive method of static-line deployment because it reduces the chance of the student interfering with main canopy deployment.
   Direct Bag 是一种更有效的 Static-Line 开伞方式，因为它减少了学生干扰主伞开伞的可能性。
3. The FAA requires an assist device to be used with a static line deployment when rigged with pilot-chute assist.
   联邦航空局要求，采用引导伞辅助释放方式时，Static Line 应结合一个辅助装置一起使用。
   a. The assist device must be attached at one end to the static line so that the container is opened before the device is loaded, and at the other end to the pilot chute.
      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，装置的另一端连接到引导伞上。
   b. 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。
4. The static line should be attached to an approved structural point of the airframe.
   Static Line 应连接到机身上一个经批准的结构点上。
   a. A seat belt attachment point is considered part of the airframe, but the static line should pull on it in a longitudinal direction.
      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。
   b. Aircraft seats are not considered to be part of the airframe.
      飞机座椅不被视为机身的一部分。
5. A static line should be constructed:
   Static Line 的构造应如下：
   a. with a length of at least eight 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
   b. with a locking slide fastener, ID number 43A9502 or MS70120
      带金属扣，规格编号为 43A9502 或 MS70120
   c. with 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」

1. Parachutes should not be rented or loaned to persons unqualified to carry out an intended skydive or to persons of unknown ability.
   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。
2. The use of unfamiliar (borrowed, new) equipment without sufficient preparation has been a factor in many fatalities.
   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。
3. Equipment changes:「装备的改换」
   a. Changes in type of equipment should be avoided or minimized whenever possible during student training.
      学生培训期间所使用的装备类型应尽可能避免或减少变动。
   b. For all jumpers when changes are made, adequate transition training should be provided.
      对于所有跳伞者，当换用其他装备时，必须受到足够的过渡培训。
4. When jumping a new or different main parachute, a jumper should follow the canopy familiarization progression outlined in Categories A-H of the Integrated Student Program (multiple jumps).
   当使用新的或不同的主伞跳伞时，跳伞者应遵循综合学生计划 A-H 单元中关于熟悉降落伞的要求（多次跳伞）。

J. USE OF ALTIMETERS「高度表的使用」

1. Skydivers must always know their altitude.
   跳伞者必须始终知道高度。
2. There is a great reduction of depth perception over water and at night.
   夜间和水面上的高度识别能力会急剧下降。
3. Pull altitude and other critical altitudes should be determined by using a combination of visual reference to the ground and to an altimeter.
   开伞高度和其他重要高度应结合高度表和地面视觉参考来确定。
   a. As a primary reference, each skydiver should learn to estimate critical altitudes (break-off, minimum deployment, minimum cutaway) by looking at the ground and mentally keeping track of time in freefall.
      地面以及自由落体时间作为高度的基本参考，每名跳伞者应学会通过观察地面和跟踪自由落体时间来估算重要高度（分离高度、最低开伞高度、最低切伞高度）。
   b. Altimeters provide excellent secondary references for developing and verifying primary altitude-recognition skills.
      高度表作为很好的辅助参考，可以提升和确认基于基本高度参考的高度识别技能。
   c. Some jumpers may desire more than one altimeter and even more than one altimeter of the same type to have a reference available throughout the jump.
      有些跳伞者可能希望在整个跳伞过程中有多个高度表，甚至多个同类型的高度表以做参考。
   d. Jumpers should wear their altimeters so they are available to them during as many phases of the jump as possible.
      跳伞者应佩戴高度表，以在尽可能多的跳伞阶段中使用它们。
4. Some examples of altimeter types and locations include:
   高度表类型和佩戴位置的示例如下：
   a. visual altimeter worn on the wrist
      戴在手腕上的（目视读数的）高度表
      (1) easy to read in a variety of freefall positions
          这种高度表在各种自由落体姿势中都易于读数
      (2) wrist is usually unaffected by burbles
          手腕通常不受跳伞者上方涡流的影响
      (3) difficult to read while tracking
          但在 Tracking 期间难以读数

b. visual altimeter worn on the chest or main lift web
戴在胸前或主支撑带（MLW）上的（目视读数的）高度表
(1) reference for others in a group, particularly when belly flying
为团体中的其他人提供参考，特别是在腹飞时
(2) readable during tracking
在 Tracking 期间可以读数
(3) subject to error and erratic readings while back-to-earth
背部朝下的姿态时它可能会出现误差和读数不稳定

c. audible altimeter, typically worn against the ear
声音高度表，通常戴在耳朵旁
(1) Audibles provide a good reference to key altitudes near the end of the planned freefall.
声音高度表为计划的自由落体阶段快结束时的关键高度提供了很好的参考。
(2) Extreme background noise of freefall and a jumper's attention to another event can render audible altimeters ineffective.
自由落体的极端背景噪音和跳伞者对其他事的关注可能会使声音高度表失去作用。
(3) Students should use audible altimeters only after demonstrating a satisfactory level of altitude awareness.
学生只有在证明其高度意识达到满意水平后，才能使用声音高度表。

5. Initial and refamiliarization training for altimeter use should include:
关于高度表的使用的初步培训及复习培训应包括如下事项：
a. Looking at the ground.
观察地面。
b. Looking at the altimeter and note the altitude.
再看高度表并记下高度。
c. Repeat this procedure several times per jump to develop the ability to eyeball the altitude.
每次跳伞时都应重复这个程序几次，以提高目测高度的能力。

6. Altimeter errors「高度表出错」
a. Altimeters use electronic and/or mechanical components that are subject to damage and may fail in use.
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。
b. Minor differences in indicated altitude are to be expected.
指示高度的微小差异是可以预期的。
c. Set the altimeter at the landing area and do not readjust the altimeter after leaving the ground.
应在着陆区域设置好高度表，离开地面后不要重新调整高度表。
d. An altimeter may lag during both ascent and descent; plus or minus 0-500 feet is to be expected.
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。
e. The needle can stick during both ascent and descent—a visual cross reference with the ground should be used in combination with the altimeter.
在上升和下降过程中，指针都可能会停滞—应结合对地面的观察以进行视觉上的交叉参考。
f. When the altimeter is in a burble (as when falling back-to-earth), it may read high by as much as 1,000 feet.
当高度表处于跳伞者上方的涡流中时（比如在以背部朝下的姿态下落时），它所显示的高度可能比实际的高度高出 1000 英尺之多。

7. Handle altimeters with care and maintain and store them according to the manufacturer's instructions.
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」

1. The use of personal equipment should be determined by the type of jump experience and proficiency of the skydiver, weather, and drop zone conditions.
   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。
2. Clothing and equipment:「衣服和装备」
   a. Adequate protective clothing, including jumpsuit, helmet, gloves, goggles, and footwear should be worn for all land jumps.
      对于所有在陆地上进行的跳伞，都应穿上符合需求的保护用具，包括连体服（跳伞服）、头盔、手套、护目镜和鞋类。
   b. Gloves are essential when the jump altitude temperature is lower than 40° F.
      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。
   c. A jumper should always carry a protected but accessible knife.
      跳伞者应始终配有带保护的容易够到的伞刀。
   d. A rigid helmet—
      一顶坚固的头盔—
      (1) should be worn on all skydives (tandem students may wear soft helmets)
          应在所有跳伞中戴上（双人伞学生可戴软头盔）
      (2) should be lightweight and not restrict vision or hearing
          应重量轻，不限制视野或听觉
   e. All jumpers are advised to wear flotation gear when the intended exit, opening, or landing point of a skydive 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).
      当预定的离机、开伞或着陆点距离开阔水域（开阔水域的定义是跳伞员可能会被淹死的水域）不到一英里时，建议所有跳伞者都穿戴飘浮装置。

L. MAIN PARACHUTE PACKING「叠主伞」

1. The main parachute of a dual assembly may be packed by—
   以下的人有资格叠双降落伞系统的主伞—
   a. an FAA rigger
      联邦航空局认证的降落伞装备师
      (1) 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（FAR 65.125.a 和 b）。
      (2) 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（FAR 105.43.a）。
   b. the person who intends to use it on the next jump (FAR 105.43.a)
      打算在下一跳伞中使用该主伞的人（FAR 105.43.a）
2. Packing knowledge:
   叠伞知识：
   a. Each individual skydiver should have the written approval of an S&TA, USPA Instructor, Examiner, or an FAA rigger to pack his or her own parachute.
      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。
   b. All parachute packers should know and understand the manufacturer's instructions for packing, maintenance, and use.
      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。

3. Tandem main parachutes may be packed by (FAR 105.45.b.1)—
以下的人有资格叠双人伞主伞（FAR 105.45.b.1）—
   a. an FAA rigger
   联邦航空局认证的降落伞装备师
   b. 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。
   c. a packer under the direct supervision of a rigger
   受降落伞装备师直接监督的叠伞员
4. 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「降落伞维护」

1. Inspection:「检查：」
   a. The equipment owner should frequently inspect the equipment for any damage and wear.
   装备所有者应经常检查装备有没有损坏和磨损。
   b. Any questionable condition should be promptly corrected by a qualified person.
   任何有疑问的情况都应立即由有资格的人员处理。
   c. Detailed owner inspection of the parachute is outlined in the Equipment Section of Category G of the USPA Integrated Student Program, SIM Section 4.
   降落伞所有者的降落伞详细检查在本手册第四章 USPA 综合学生计划的 G 单元的装备部分中有概述。
2. Maintenance and repair of the reserve:
备伞的维护和维修：
   a. The FAA requires the entire reserve assembly to be maintained as an approved parachute.
   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。
   b. Repairs to the reserve assembly must be done by an FAA-certificated parachute rigger.
   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。
3. Maintenance and repair of the main:
主伞的维护和维修：
   a. Repairs to the main may be done by an FAA-certificated rigger or by the owner if he or she has adequate knowledge and skill.
   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。
   b. The main parachute and its container need not be maintained as “approved.”
   主伞及主伞伞包无需作为批准认证的降落伞来维护。
4. Major repairs and alterations may be performed only by or under the supervision of:
只有在下列人员的监督下，才可进行大修和大改：
   a. an FAA master rigger
   联邦航空局认证的高级降落伞装备师
   b. the parachute manufacturer
   降落伞制造商
   c. any other manufacturer the FAA considers competent
   联邦航空局认为有能力的任何其他制造商

5-4 跳前安全检查和简报 Pre-Jump Safety Checks and Briefings

A. EQUIPMENT PREPARATION IS ESSENTIAL「装备准备工作是必不可少的」

1. Preparing all skydiving equipment and procedures prior to each jump is critical to preventing accidents.
   每次跳伞前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。
2. This information is intended to provide the instructional staff and other experienced jumpers with a reference to use as guidance in developing a personal checklist appropriate to the procedures and equipment in use.
   本节信息旨在为教学人员和其他有经验的跳伞者提供参考，作为指引，用以制定与所用的程序和装备相适应的个人检查表。
3. In some cases, these checks will be the principal responsibility of others—the pilot, instructor, coach, rigger, ground crew chief, etc., however, no one should assume that these responsibilities have been carried out by others.
   在某些情况下，这些检查是其他人的主要责任—飞行员、教练、初级教练、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。
   a. Initially, the USPA Instructor performs these pre-jump safety checks and briefings for his or her students.
      一开始，USPA 教练替学生进行跳前安全检查和简报。
   b. As students progress, they should begin to learn to do them for themselves.
      随着学生一点点进步，应开始学会自己进行这些检查。
   c. Through leadership and attitude, the instructional staff has the opportunity to foster a respect for safety that will serve the beginning skydiver well when assuming sole responsibility for all of his or her skydiving activities.
      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。
4. Students progressing through the training program and all experienced jumpers should review all of the items on these lists to familiarize themselves with the wide range of details.
   参加培训计划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。
5. This section includes checklists for:
   本节包括下列检查表：
   a. aircraft preflight「飞行前的飞机检查」
   b. ground crew briefing「地勤人员简报」
   c. pilot briefing「飞行员简报」
   d. skydiver briefing「跳伞者简报」
   e. equipment check「装备检查」
   f. before-takeoff check「起飞前检查」
   g. takeoff「起飞」
   h. spotting「看点定位」
   i. jump run「跳伞航线」
   j. descent and landing in aircraft「随飞机一起降落」
   k. post-jump debriefing「跳伞后的汇报」

B. BRIEFINGS「简报」

1. Aircraft preflight (primarily the responsibility of the pilot, but the supervising USPA instructional rating holder should check also):
   飞行前的飞机检查（主要由飞行员负责，但负责监督的评级在有效期内的 USPA 教学评级持有者也应检查）：
   a. placards: in place (as required)
      标识：放置到位（根据规定的需要）

b. seats removed (as required)
座椅已被拆除（根据规定的需要）
c. door stop (under Cessna wing) removed
门挡（塞斯纳飞机的机翼下）已被拆除
d. sharp objects taped
尖锐物体被用胶带封住
e. loose objects secured
没有约束的物体固定好
f. steps and handholds secure, clean of oil
台阶和扶手稳固、无油污
g. aircraft altimeter set
飞机高度表设置好
h. 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）
i. aircraft radio serviceable
飞机无线电通信可用
j. static-line attachment secure
Static Line 连接处安全稳固
k. knife in place and accessible
伞刀放到位，容易够到
l. 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）
m. winds-aloft report or wind-drift indicators available
高空风报告或风飘指示器可用
n. seat belts available and serviceable
配备了安全带且能够正常使用
o. passenger hand straps near door removed
靠近舱门的乘客手带已被拆除

2. Ground crew briefing: A load organizer (a senior jumper or instructional rating holder) should coordinate to ensure that everyone is in agreement:
地勤人员简报：架次安排者（资深跳伞者或评级在有效期内的教学评级持有者）应进行协调，以确保关于每个人对如下的事项都达成一致：
a. communications procedures to meet BSR requirements for ground-to-air communication: smoke, panels, radio, etc.
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。
b. jump order
跳伞顺序
c. distance between groups on exit
出舱时各团体之间的间隔距离
d. landing pattern priorities
着陆航线的优先次序
e. control of spectators and vehicles
观众和车辆的管控
f. student operations (USPA Instructor)
学生跳伞作业（USPA 教练）
(1) wind limitations
风的限制

(2) 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
(3) critiques of student landings
对学生着陆表现进行评价
(4) maintenance of master log
主日志的维护
(5) accident and first-aid procedures
事故和急救程序

3. Pilot briefing: The load organizer coordinates with the pilot.
飞行员简报：架次安排者与飞行员协调。
a. jump run altitudes
跳伞航线的高度
b. jump run direction
跳伞航线的航向
c. communications (ground to air, jumpmaster to pilot, air traffic control)
沟通（地对空、跳伞指导对飞行员、空中交通管制）
d. aircraft attitudes during corrections on jump run
在跳伞航线上进行修正时的飞机姿态
e. jump run speed and cut
跳伞航线上的飞行速度，以及油门的控制
f. locking wheel brake (if applicable), but the parking brake is not to be used
轮胎锁定制动器（如适用），但不应使用驻车制动
g. gross weight and center of gravity requirements and limitations
总重量和重心的要求和限制
h. procedures for aircraft emergencies
飞机紧急情况的处理程序
i. procedures for equipment emergencies in the aircraft
机内装备紧急情况的处理程序

4. Skydiver briefing「跳伞者简报」
a. conducted by the load organizer
由架次安排者进行
(1) seat belt off altitude: 1,500 feet above ground level (AGL) or designated by DZ policy
解开安全带的高度：离地高度 1500 英尺以上或由跳伞降落区政策指定
(2) movement in the aircraft, especially during jump run
在飞机上如何移位，尤其是在跳伞航线上
(3) aircraft emergency procedures, including communication procedures
飞机紧急程序，包括沟通程序
(4) parachute equipment emergency procedures
降落伞装备紧急情况的处理程序
b. to be conducted by the USPA Instructor:
以下简报由 USPA 教练进行：
(1) review of student log or record
检查学生的日志或记录
(2) jump plan「跳伞计划」
(i) exit and freefall, including jump commands
出舱和自由落体，包括跳伞指令

(ii) emergency procedure training or review
紧急程序的培训或复习

(iii) canopy control and landing pattern
降落伞的控制和着陆航线

(iv) drop zone appearance and hazards (an aerial photo or map is recommended)
降落区的情况和危险障碍物（建议使用航拍图或地图）

(3) protection of operation handles and pins
操作把手和关包针的保护

(4) conduct in aircraft: mental preparation and movement
飞机上的行为：如何做好心理准备和如何在舱内移动

C. EQUIPMENT CHECKLIST「装备检查表」

1. Equipment check responsibilities before boarding and before exiting:
登机前和出舱前的装备检查责任：

a. The USPA Instructor or Coach checks the student's equipment.
USPA 教练或初级教练应检查学生的装备。

b. Each individual skydiver ensures that his or her own equipment is inspected three times prior to each jump.
每名跳伞者需要确保在每次跳伞前检查自己的装备三次。

(1) before putting it on
穿上装备前

(2) prior to boarding
登机前

(3) prior to exit
出舱前

2. Checklist「检查表」

a. helmet: proper fit and the chin strap threaded correctly
头盔：大小合适、下巴的带子穿戴正确

b. goggles or glasses secure and clean
护目镜或眼镜：戴得稳、且干净清晰

c. canopy releases: properly assembled and periodic maintenance performed
降落伞释放装置：组装正确、并已进行定期维护

d. 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）

e. altimeters checked and set and ensure that 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

f. main parachute「主伞」

(1) main canopy properly sized
主伞尺寸合适

(2) 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

(3) activation device
（主伞）激活（开伞）装置

(i) ripcord: secure in the pocket, housing tacked and secured on both ends, proper movement of the pin or cable in the housing and closing loop, and pilot chute seated correctly
拉索系统：开伞把手固定好、拉索收纳管两端固定稳且保护好、穿过收纳管和关包绳的关包针或开伞拉索可正常移动、引导伞正确安置

(ii) throw-out pilot chute: secure in the pouch, bridle routed correctly and secure, pin secure on the bridle and seated in the closing loop, and slack above the pin (this may apply to some rigs; see manufacturer's instructions for details)
抛出式引导伞：引导伞妥善塞入收纳袋里、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（这可能适用于某些装备；详见制造商的说明）

(iii) 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)
拉出式引导伞（不允许学生使用）：把手稳固：关包针插好，拉出关包针的行程中，开伞把手的移动应是畅通无阻的（参考制造商说明）

(4) practice main deployment handle secure (student)
主伞模拟开伞把手固定稳（学生）

g. harness:「背带」

(1) straps not twisted and routed correctly
下列各织带无扭曲、走线正确

(i) chest strap「胸带」

(ii) leg straps「腿带」

(iii) belly band, if applicable「腹带（如适用）」

(2) 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

(3) adjusted for proper fit
松紧度调整好

(4) running ends turned back and sewn
线头或织带的末端已被反折并缝好

(5) loose ends tucked into keepers
该塞的东西塞好，该固定的东西固定好

h. belly band (if used)「腹带（如使用）」

(1) correctly routed「走线要正确」

(2) adjusted「调整好松紧」

(3) friction adapter properly threaded「（借助摩擦力系牢的）调节扣安装正确」

i. reserve「备伞」

(1) proper size for jumper
备伞的尺寸应适合跳伞者

(2) 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

(3) pilot chute seated
引导伞装好

(4) 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

(5) ripcord handle pocket condition
备伞把手固定夹层（即固定备伞把手的那个地方）状态良好

(6) pin cover flap closed
关包针挡盖塞好

(7) overall appearance
整体外观状态良好

j. risers not twisted and toggles secure
组提带未扭曲，刹车棒收好

k. suspension and control lines not exposed
伞绳悬挂线和刹车线未外露

l. static line (students) 「Static Line（学生）」
   (1) correct length, routing, and slack for operation compatible with that aircraft
   正确的长度、走线和松驰度，应与所用的飞机相兼容
   (2) assist device (if required) attached properly
   辅助装置（如须使用）连接正确
   (3) static-line secured to prevent premature deployment
   Static-Line 固定稳保护好，以防止过早开伞
   (4) closing pin or cable in place
   关包针或拉索到位

m. personal:「个人穿戴」
   (1) footwear—proper type and fit, no open hooks or buckles
   鞋类—合适的类型和大小、没有开放的钩子或扣子
   (2) protective clothing
   保护用具
      (i) jumpsuit pockets closed
      连体服（跳伞服）口袋拉链拉上
      (ii) other outerwear compatible with jumping
      其他适合跳伞的外套
      (iii) gloves as required
      按需戴手套
   (3) no unnecessary accessories, such as cameras
   非必须的附件不带，如摄像设备
   (4) empty pockets「口袋清空」
   (5) earplugs「耳塞」

n. automatic activation device (AAD):「自动激活装置（AAD）」
   (1) serviced according to manufacturer's schedule
   符合制造商的维护日程要求
   (2) calibrated for jump (if required)
   已校准（如需要）
   (3) proper routing of cable(s)
   线缆的走线正确
   (4) control unit secured in proper location
   控制单元安放在正确的位置
   (5) armed or turned on as required
   按要求进行预位或开启

o. radio (students) properly secured and functional (test with base station)
学生的无线电戴稳且功能正常（与基站进行测试）

p. condition of all touch fastener (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 一般指降落伞伞包以及某些部件上的凸条状（Tab）附加延伸部分，与 Tuck Flap 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，常见于备伞关包针挡盖、刹车棒等部件上。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，但有时候也会混用，例如组提带挡盖的加塞片有时候称作 Tuck Tab，有时候称作 Tuck Flap）

q. overall fit and appearance
整体合身，外观状态良好

5-5 天气 Weather

A. DETERMINING WINDS「确定风况」

1. Surface winds must be determined prior to jumping and should be measured at the actual landing area.
   地面风况必须在跳伞前确认好，并应在实际着陆区测量。
2. Winds aloft「高空风」
   a. Winds aloft reports available from the FAA flight service are only forecasts.
      联邦航空局航班服务部可提供的高空风报告仅为预报。
   b. Observations may be made while in flight using navigation systems, for example, global positioning satellite systems (GPS).
      在飞行中可以借助导航系统（例如全球定位卫星系统）来观察风况。
   c. Winds can change at any time, so all available information should be checked by the jumper before and during the jump.
      风况可能随时变化，所以跳伞者在跳伞前和跳伞过程中都应检视所有可用的信息。

B. HAZARDOUS WEATHER「危险天气」

1. Fronts approach with much warning but can catch the unaware off guard.
   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。
   a. Some fronts are preceded by a gust front (a line of sudden and severe weather).
      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）。
   b. Frontal approach and passage may be associated with rapid and significant changes in the strength and direction of the winds aloft and on the surface.
      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。
2. 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。
3. Dust devils are mini-tornadoes that spontaneously generate on days of high thermal convection activity.
   尘卷风是小型龙卷风，在有高强度热对流的时候会自发产生。
4. Where to get practical information on approaching weather:
   实用天气预报信息的来源：
   a. the Weather Channel
      气象频道
   b. www.weather.com
      气象网站（www.weather.com）
   c. TV weathercasts
      电视天气预报
   d. pilot assistance (legally responsible to know the weather conditions before flight)
      飞行员的协助（飞行员对飞行前了解天气状况负有法律责任）
   e. continuous observation
      持续观察天气

C. DENSITY ALTITUDE「密度高度」

1. Parachute performance is measured at sea level in moderate temperatures and humidity.
   降落伞性能是在海平面（气压、密度等）以及温和的温度和湿度条件下测量的。
2. Altitude, heat, and humidity influence the density of air
   海拔、温度和湿度都会影响空气密度

3. Density altitude is a measure of air density that is calculated according to the temperature and altitude.
   密度高度是根据气温和高度计算的空气密度的量度。
4. As density altitude increases, airspeed increases by
   随着密度高度的增加，空速以如下方式增加：
   a. almost five percent per 3,000 feet up to 12,000 feet MSL
      海拔 12000 英尺以下，密度高度每增加 3000 英尺，空速会提高近 5%
   b. more than five percent per 3,000 feet above 12,000 feet MSL
      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%
5. As density altitude increases, a ram-air canopy pilot can expect the following:
   随着密度高度的增加，预期冲压空气式降落伞的性能会有以下变化：
   a. a higher stall speed
      更高的失速速度
   b. a faster forward speed
      更快的前进速度
   c. a faster descent rate
      更快的下降速率
   d. higher opening forces
      更强的开伞冲击
6. Additionally, aircraft are affected by higher density altitude in the following ways:
   此外，较高的密度高度会以如下方式影响飞机：
   a. longer distances required for takeoff and landing
      起飞和着陆需要更长的距离
   b. reduced propeller effectiveness
      螺旋桨效率更低
   c. poorer turbine and piston engine performance
      涡轮发动机和活塞式发动机性能更差
   d. slower and flatter rate of climb
      更慢和更平坦的爬升率
   e. less useful load
      可搭载的有效载荷减少
7. The aircraft pilot is responsible to know the density altitude prior to takeoff, and skydivers are advised to 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。建议跳伞者也考虑密度高度对降落伞性能的影响。

5-6 飞机 Aircraft

1. 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入的关系，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。
   a. Parasitic drag reduces airspeed necessary for flight and reduces the effectiveness of control surfaces.
      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。
   b. Excess weight in the rear of the aircraft can cause the pilot to lose control of the aircraft and cause it to stall.
      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。
2. All jumpers should be briefed by a jump pilot on the topics outlined in Aircraft Briefing from Category E of the USPA Integrated Student Program (SIM Section 4).
   跳伞作业飞行员应就 USPA 综合学生计划（本手册第四章）E 单元中「飞机简报」中概述的主题向跳伞者进行简报。
3. The smallest aircraft to be used for student jumping should be able to carry the pilot and at least three jumpers.
   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。
4. High openings「高开」
   a. The pilot and all jumpers on board the aircraft should be informed in advance whenever an opening is planned to be above the normal opening altitude (generally 5,000 feet AGL and lower).
      当计划开伞高度高于正常开伞高度（正常开伞高度通常为离地高度 5000 英尺及以下）时，应提前通知飞行员和飞机上的所有跳伞者。
   b. When more than one aircraft is being used, the pilots of each aircraft in flight at the time of the jump should be notified.
      当多架飞机正被使用时，跳伞期间，应就高开通知飞行中的每架飞机的飞行员。
5. Aircraft fueling「飞机加油」
   a. 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.
      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。
   b. 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.
      USPA 接受某些涡轮动力飞机的快速加油（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。
6. Entering the aircraft「登机」
   a. 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.
      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。
   b. 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.
      每个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。
   c. Everyone should always protect his or her ripcord handles while entering the aircraft and follow procedures to avoid the accidental activation of any equipment.
      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。
7. 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.
飞机上的每个人都要遵守 FAR 91.107 中的座位要求和 FAR 91.307 中的降落伞要求。

8. Ride to altitude「飞机爬升的过程」
   a. 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.
      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。
   b. Seat belts should remain fastened and all hard helmets and other potential projectiles secured until the pilot notifies the jumpers that they may unfasten them.
      在飞行员通知跳伞者可以解开安全带，摘下头盔，解除对可移动物体的固定之前，跳伞者应继续系好安全带，佩戴坚固的头盔，并固定好和其他潜在的可移动物体。
   c. Students should sit still and move only when specifically directed to do so by their instructor(s) or coach.
      学生应该坐着不动，除非教练或初级教练明确指示学生移动。
   d. Seating arrangements should be determined in advance and will vary according to the particular aircraft and the size and type of the load.
      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。
   e. It is important for the load to be properly distributed in the aircraft to maintain the balance in relation to the center of gravity, which is necessary for the aircraft to fly safely.
      载荷在飞机上的合适分布很重要，以保持重心平衡，这对保证飞机的安全飞行是必要的。
   f. The jumpers must cooperate fully with the pilot to keep the aircraft within its safe performance envelope throughout the entire flight.
      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。
   g. The aircraft must not be loaded with more weight than the maximum allowed in the manufacturer's operating manual.
      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。
   h. Failure to maintain proper weight and balance throughout the flight may result in loss of control of the aircraft.
      如果不能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。
9. When not in use, seat belts should be stowed out of the way but never fastened together unless being worn.
   安全带在不使用时应收好，但除非被戴上，否则不要扣在一起。
10. All pilots and other occupants of a jump aircraft must wear parachutes when required by the FAA.
    当受到联邦航空局要求时，跳伞作业飞机的所有飞行员和其他乘客都必须佩带降落伞。

5-7 看点定位 Spotting

A. WHY SPOTTING IS IMPORTANT「为什么看点定位很重要」

1. 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.
   选择正确的出舱点并引导飞行员飞到那里有助于跳伞者履行在适当的空旷的地方着陆的责任。
2. Jumpers must demonstrate basic spotting abilities prior to obtaining the USPA A license.
   在获得 USPA A 执照之前，跳伞者必须证明其有基本的看点定位能力。
3. Spotting in more difficult circumstances requires continued practice and study.
   在更困难的情况下看点定位需要不断的练习和学习。
4. 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.
   除了考虑在正确的点位让一名跳伞者或一组跳伞者出舱外，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」

1. Be familiar with the DZ and surrounding area, including exit and opening points.
   建议跳伞者熟悉降落区及周边地区，包括出舱点和开伞点。
   a. Jumpers should observe and talk to those on previous jumps to help determine the correct jump-run direction and exit and opening point.
      跳伞者应观察并讨论不久前刚跳伞的跳伞者的伞降情况，以帮助确定正确的跳伞航线航向、出舱点、开伞点。
   b. Methods for estimating the exit and opening point based on winds-aloft forecasts are explained in the Aircraft and Spotting sections of Categories F and G of the Integrated Student Program, Section 4 of this manual.
      基于高空风预报预估出舱点和开伞点的方法，在本手册第四章 USPA 综合学生计划的 F 和 G 单元的飞机和看点定位部分中说明。
   c. A wind-drift indicator (WDI) is effective for determining drift under canopy.
      风飘指示器是确定开伞后跳伞者会被风吹多远的有效方法。
      (1) A piece of weighted crepe paper is released at canopy opening altitude over an observed position or at half of the opening altitude so the ground travel will be doubled for the jump.
      在观测位置上方的开伞高度处，释放一张带配重的绉纸（即风飘指示器），或者在开伞高度的一半释放它（这样降落伞相对地面的漂移量就是测量值的 2 倍）。
      (2) The jumpers aboard the aircraft observe the drift of the WDI to determine the distance and direction of the best opening point upwind of the target.
      飞机上的跳伞者观察风飘指示器的漂移量，以确定着陆目标上风处的最佳开伞点的距离和方向。
      (3) Jumpers should be responsible for wind drift indicators after they land.
      跳伞者着陆后应负责回收风飘指示器。
      (4) Observation and calculation of the spot from the winds-aloft report have replaced the WDI for most routine drop zone operations.
      在大多数常规的跳伞基地作业中，根据高空风况报告对点位进行观察和计算，已经取代了风飘指示器。
2. Look out of the aircraft:「向飞机外看，观察下列情况：」
   a. for traffic below「飞机下方的空中交通」
   b. for clouds「云层」
   c. spot「点位」

3. Identify the DZ, the climbout point, and the exit point from the open door of the aircraft.
从打开的舱门处进行观察，确定降落区位置、舱门爬出点和出舱点。
4. Techniques for determining the point straight below the aircraft are discussed in Category D of the ISP.
综合学生计划的 D 单元讨论了确定飞机正下方的地面位置的技巧。

C. GROUP SEPARATION ON JUMP RUN「在跳伞航线中各团体之间的分开间隔」

1. Slower-falling jumpers and groups are exposed to upper headwinds longer and are blown farther downwind than faster-falling jumpers and groups.
比起下落速度较快的跳伞者和团体，下落速度较慢的跳伞者和团体暴露在高空逆风中的时间更长，并会被吹到下风处更远的地方。
   a. Slower-falling groups should exit before faster-falling groups if jump run is flown into the wind.
   如果在跳伞航线上逆风而飞行，下落速度较慢的团体应先于下落速度较快的团体出舱。
   b. On days with strong upper headwinds, allow more time between groups on the same pass to get sufficient horizontal separation over the ground.
   在有高空强逆风的日子里，应让同一批次出舱的各团体之间的出舱间隔时间更长，以让各团体相对于的地面位置有足够的水平间隔。
      (1) Provide at least 1,000 feet of ground separation between individuals jumping solo.
      每名单人跳伞者之间建议至少有 1000 英尺的间隔距离（相对地面）。
      (2) Provide at least 1,500 feet of ground separation between small groups, adding more as size of the groups increases.
      每组小规模团体之间建议至少有 1500 英尺的间隔距离（相对地面），随着团体规模的增加，距离也要增加。
   c. Once the parachute has opened, delay flying up or down the line of flight until—
   开伞后，应推迟沿飞机的飞行路线向前或向后飞行，直到—
      (1) Any slower-falling group that exited before has opened their parachutes and turned toward the landing area.
      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。
      (2) The group exiting after has completed their freefall and opened.
      较晚出舱的团体已完成自由落体并开伞。
2. Flying jump run across the upper winds (crosswind) helps achieve separation between groups.
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。
3. 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.
无论是飞一架飞机还是多架飞机，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 「对于不同的跳伞类型（科目），出舱计划和飞行计划的注意事项」

1. Larger jump aircraft may include several different groups of skydivers performing different disciplines, some of which use more airspace than others.
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。
   a. Formation skydivers falling in a belly-to-earth orientation.「以腹部朝下姿态下落的跳伞团体编队。」
   b. Freeflying formations falling in head-down, standing or sitting formations.「以倒飞、站飞或坐飞的姿态下落的自由飞编队。」
   c. Free-fall students with instructors.「自由落体的学生和教练。」
   d. Tandem students and instructors.「双人伞学生和教练。」

e. Tracking groups.「进行 Tracking 的团体编队。」
f. Angle flying groups.「进行 Angle 的团体编队。」
g. Wing-suit flyers.「翼装跳伞者。」

2. Some of these groups will tend to descend straight down after exit, drifting horizontally with the effects of wind, but otherwise not moving much in the airspace.
其中一些团体在出舱后会倾向于直线下落，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。

3. These groups include formation skydivers, freeflyers, solo students and tandem students, and 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.
这些团体包含编队跳伞者、自由飞跳伞者、单人跳伞学生和双人伞学生。为了分开足够距离，应首先按跳伞类型分开，然后同一跳伞类型内，大的团体先出舱，小的团体后出舱，而且团体与团体之间需有适当的出舱时间间隔，从而让各团体之间分开足够距离。

4. Tracking groups, angle flying groups, and wingsuiters will cover large horizontal distances that must be taken into account when planning a descent strategy.
进行 Tracking、Angle、翼装飞行的团体编队会移动很大的水平距离，在规划伞降时必须考虑这一点。
   a. These groups must fly a specific flight path planned before boarding the aircraft.
   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。
   b. Exiting last is the most common exit order for tracking groups, angle flyers and wingsuiters.
   进行 Tracking、Angle、翼装飞行的团体编队一般最后出舱。
   c. Immediately after exit, the group needs to fly perpendicular to the jump run to provide lateral separation from the other groups on the aircraft.
   出舱后该团体需要立即垂直于跳伞航线飞行，以与飞机上其他团体横向分开足够距离。
   d. After gaining sufficient lateral distance, the group may then turn in a downwind direction, flying parallel to the other groups that exited earlier.
   在获得足够的横向间隔距离后，该团体可以转向顺风方向，平行于先前出舱的其他团体飞行。
   e. The jumper leading this type of group must keep the group flying in the planned direction for the entire freefall distance, maintaining adequate lateral separation.
   这类团体跳伞者的领队必须在整个自由落体距离内让团体按计划方向飞行，保持足够的横向间隔距离。
   f. The break-off point must be far enough laterally to allow for these jumpers to gain horizontal separation from each other as well as any of the groups that exited the airplane earlier.
   这类团体的开伞前的分离点与其他跳伞团体间的横向距离必须足够远，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。
   g. Airplane loads that include more than one group of tracking groups, angle flyers or wingsuiters will add additional complexity to the airspace requirements necessary to allow each group to open in a clear area.
   飞机上如有一组以上的 Tracking、Angle 或翼装飞行的团体编队，将额外增加空域要求的复杂度，使各团体在空旷空域中开伞的难度增加。
   h. Depending on the situation, it may be safer to restrict each airplane load to only one group of tracking jumpers, angle flyers or wingsuiters.
   视情况而言，可能更安全的做法是，每架飞机上只允许有一组 Tracking 团体编队、Angle 团体编队，或翼装飞行团体编队。

5-8 事件报告 Incident Reports

A. INCIDENTS「事件」

1. USPA rating holders and S&TAs, the leaders in the field, are the key to having skydivers file incident reports. Reporting these incidents can help USPA track current trends in the field and give direction to USPA staff and board members for addressing equipment issues and training methods and for establishing safety procedures.
   USPA 教学练评级持有者、安全和培训顾问，以及跳伞现场的领导者，是让跳伞者提交事件报告的关键。事件报告有助于 USPA 跟踪跳伞领域的当前趋势，为 USPA 工作人员和董事会成员纠正装备问题和培训方法以及建立安全程序提供指导。
2. An incident that requires reporting includes any event that requires medical attention or raises a safety concern, but other incidents that should be reported include noteworthy malfunctions, unsafe procedures, unusual or ethically unacceptable skydives, or other extraordinary occurrences concerning skydiving operations.
   需要报告的事件包括任何需要医疗照顾或引起安全顾虑的事件，其他应该报告的事件包括值得关注的故障、不安全的程序、异常或道德上不可接受的跳伞行为，或其他有关跳伞作业的特殊事件。
3. Incident reports are warranted for the following (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）：
   a. Fatalities
      致命事故
   b. 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）
   c. Any injuries of a student (including tandem students)
      学生的任何受伤（包括双人伞学生）
   d. Reserve deployments (intentional or unintentional)
      备伞被打开（无论是刻意的还是意外的）
   e. AAD activations
      AAD 被激活
   f. 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）
   g. Emergency exits from an aircraft
      飞机紧急出舱
   h. Freefall or canopy collisions
      自由落体时或开伞后与其他跳伞者发生碰撞
   i. Premature deployments in aircraft or freefall
      在飞机上或自由落体时过早意外开伞
   j. Harness or canopy damaged during jump
      跳伞时，背带或降落伞伞布受损
   k. The unplanned dropping of equipment during jump
      跳伞时，有装备意外掉落
   l. 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」

1. Fatalities and other significant incidents are an unfortunate part of skydiving that must be addressed. Skydivers learn essential lessons from the mistakes of others. USPA members should take it upon themselves to fill out an incident report when it meets any of the conditions in A.3 of this section, but when appropriate the S&TA can act as an impartial investigator for any incident.

死亡和其他重大事件是跳伞运动中令人难受的一部分，必须加以关注解决。跳伞者可以从他人的错误中可吸取必要的教训。如果遇到符合本节 A.3 中的任何条件的情况，USPA 会员应主动填写事件报告。在适当的情况下，安全和培训顾问可作为调查员，负责对任何事件进行公正的调查。

To create an accurate account, USPA needs everyone to gather information about incidents and report them to USPA. When an event requires several reports, including witness accounts and/or the personal observations of the investigator, the efforts should be coordinated through the local S&TA.
为了能够对情况做出准确的说明，USPA 需要每个人收集与事件相关的信息，并向 USPA 报告。当一个事件需要多份报告（包括目击者陈述和/或调查员的个人观察）时，应由当地的安全和培训顾问来协调这些事情。

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。报告机制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」

1. To maintain the confidentiality of the report and to protect the integrity of the USPA incident reporting system, USPA observes the following operating procedures. Everyone should carefully follow the procedures outlined.
   USPA 遵守以下操作程序，以维护报告的机密性，并保护 USPA 事件报告机制的完整性。每个人都应认真遵守下述程序。
   a. The reporting party should use the online submission process but when unavailable print or type a detailed report of each significant incident and send the original report to USPA Headquarters.
      报告方应在线提交报告。如果无法通过在线方式提交，应打印或打出每个重大事件的详细报告，并将报告原件寄给 USPA 总部。
   b. USPA Headquarters stores any information to identify trends for USPA and the skydiving industry.
      USPA 总部会保存任何可用于 USPA 和跳伞行业趋势分析的信息。
   c. Names and locations are not stored in the electronic database.
      姓名和地点不会存储在电子数据库中。
   d. The submitted reports are destroyed once the accident information is entered into the electronic database.
      一旦事故信息被输入电子数据库，所提交的报告就会被销毁。
   e. Submitting the information using the online incident report form found at uspa.org will help ensure accuracy and keep the data secure.
      使用在线的事件报告表（在 uspa.org 网站上可以找到）提交信息将有助于确保准确性并保证数据的安全。
   f. USPA Headquarters may publish a brief synopsis of the report in Parachutist, excluding the date, specific location and names of anyone involved.
      USPA 总部可能会在“跳伞者”（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 REPORT FORM「事件报告表」

1. Proper use of the accident report form will help to ensure that all the necessary information is submitted to USPA.
   正确使用报告表有助于确保所有必要的信息都能被提交给 USPA。
2. Detailed information in the narrative will help USPA produce an accurate summary of the accident.
   在陈述中提供详细信息有助于 USPA 对事故做出准确的总结。
3. The types of injuries must be included in both fatal and non-fatal reports.
   致命和非致命事件的报告中都必须填写受伤的类型。
4. If the report is non-fatal, provide the prognosis for the jumper's recovery.
   如果报告的是非致命事件，应提供跳伞者康复的预后。

5. All of the factors that led to the accident must also be included to help determine how the accident occurred.
报告还必须包含所有导致事故的因素，以帮助确定事故是如何发生的。

E. USPA POLICY REGARDING PROPRIETY AND PRIVILEGED INFORMATION
「USPA 关于正当性和特许保密信息的政策」

1. Background「背景」
   a. The success of USPA's safety reporting program depends upon the free exchange of information between field reporters (e.g., S&TAs) 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如何，取决于现场报告人员（如安全和培训顾问）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。
2. Policy「政策」
   a. 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。
   b. 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。
   c. 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。

第六章 进阶

Advanced Progression

SECTION SUMMARY「章节摘要」

Completing the basic instruction and earning a license presents many new opportunities for advanced progression in skydiving. Advancement in one or more of the areas discussed in this section will help to improve your skills and increase your enjoyment and satisfaction from the sport.
完成基本指导要求和获得执照可为跳伞的进阶提供许多新机会。本节讨论一个或多个跳伞领域的进阶内容，有助于提高你的技能，增加你从运动中获得的乐趣和满足感。

Information in this section provides guidance for night jumping, water landings, canopy formation, high altitude jumps, flying a camera, jumping wingsuits and advanced canopy flight.
本节为夜间跳伞、水上降落、降落伞编队、高海拔跳伞、带相机跳伞、翼装和高级伞控提供指引。

These guidelines will also assist you in meeting your skill and knowledge requirements for the USPA B, C, and D licenses and USPA ratings.
这些指南还将帮助你满足 USPA B、C 和 D 执照和 USPA 评级的技能和知识要求。

IMPORTANT REFERENCE NUMBERS「重要参考内容指引」

- group freefall—6-1
  团体自由落体 6-1
- freeflying, freestyle, and skysurfing—6-2
  自由飞、自由式和空中滑板 6-2
- rate of descent and time table—6-3
  自由落体下降速度和时间表 6-3
- night jumps—6-4
  夜间跳伞 6-4
- water landings—6-5
  水上降落 6-5
- canopy formation—6-6
  降落伞编队 6-6
- high altitude jumps and oxygen use—6-7
  高海拔和氧气使用 6-7
- camera flying—6-8
  带相机跳伞 6-8
- wing suits—6-9
  翼装飞行 6-9
- canopy flight fundamentals—6-10
  降落伞控制基本原理（伞控） 6-10
- advanced canopy flight topics—6-11
  高级伞控主题 6-11

WHO NEEDS THIS SECTION?「谁需要这部分」

- jumpers planning to engage in new types of skydiving activities
  计划进行新类型跳伞活动的跳伞者
- jumpers planning extraordinary skydives
  计划进行特殊跳伞的跳伞者
- jumpers working on advanced USPA licenses and ratings
  致力于获得高级别 USPA 执照和评级的跳伞者
- USPA Instructors conducting night and water jump briefings
  进行夜间和水上跳伞简报的 USPA 教练
- USPA officials advising jumpers on extraordinary skydives
  为跳伞者提供特殊跳伞的建议的 USPA 官员

6-1 团体自由落体（跳伞编队）Group Freefall (Relative Work)

A. WHAT IS RELATIVE WORK?「什么是跳伞编队」

1. Group skydiving, traditionally called "relative work," may be described as 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的近距离的机动。
2. The concept of group skydiving is the smooth flow and grace of two or more jumpers in aerial harmony.
   团体跳伞的概念是两位或多位跳伞者在空中协调进行的流畅优雅的飞行。
   a. Mid-air collisions and funneled formations are not only undesirable but can be dangerous.
      空中碰撞和漏斗效应不仅不好，而且很危险。
   b. The colliding of two bodies in flight can cause severe injuries or death.
      两名跳伞者在飞行中相撞可能会造成重伤或死亡。
   c. The greatest danger exists when jumpers lose sight of each other and open independently, which may set the stage for a jumper in freefall to collide with an open canopy.
      跳伞者看不见彼此并各自开伞的情形是最危险的，这可能为跳伞者在自由落体时与打开的降落伞发生碰撞创造条件。
   d. Even after opening, there is the possible danger of canopy collisions if proper safety procedures are not followed.
      即使在开伞后，如果不遵循适当的安全程序，也可能会有降落伞碰撞的危险。

B. TRAINING AND PROCEDURES「培训和程序」

1. Before training for group freefall, each student should complete all the training and advancement criteria through Category F of the USPA Integrated Student Program, Section 4 of this manual.
   在进行团体自由落体培训前，学生应先通过本手册第 4 章 USPA 综合学生计划 F 单元的所有培训和晋级标准。
2. Initial training for group freefall skills should begin as soon as the student completes Category F of the ISP—
   完成 F 单元的学习后，应尽快开始团体自由落体技能的初始培训，以达到以下目的—
   a. to maintain interest in skydiving
      保持对跳伞的兴趣
   b. to encourage relaxation in the air
      有利于在空中放松
   c. to develop coordination
      提升协作能力
   d. to establish participation in group activities
      参与到团体活动中
   e. to encourage the development of safe attitudes and procedures
      提升安全意识和程序
3. Initial training should begin with no more than two jumpers—the trainee and a USPA instructional rating holder.
   初始培训开始时，跳伞者不应该超过两人，即学生和 USPA 教学评级持有者。
4. A recommended training outline for beginning group freefall skills is included in Categories G and H of the ISP.
   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. BREAKOFF「分离」

1. The minimum breakoff altitude should be—
   最低分离高度应为—

a. for groups of five or fewer, at least 1,500 feet higher than the highest planned deployment altitude in the group (not counting one camera flyer)
对于 5 人或 5 人以下的团体，至少比团体中计划的最高开伞高度高 1500 英尺（不包括一名摄影者）

b. for groups of six or more, at least 2,000 feet higher than the highest planned deployment altitude in the group (not counting a signaling deployment or camera flyers)
对于 6 人或 6 人以上的团体，至少比团体中计划的最高开伞高度高 2000 英尺（不包括开伞示意或摄影者）

c. higher than these recommendations for the following:「对于以下情况，最低分离高度应更高」
   (1) groups with one or more jumpers of lower experience
   团体中有一位或多位经验较少的跳伞者
   (2) 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
   (3) 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
   (4) jumps involving props, toys, or other special equipment, (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（自由落体中释放了标志、横幅、彩烟、旗帜、呼啦圈、管子等物品）
   (5) jumps taking place over an unfamiliar landing area or in case of an off-field landing (bad spot recognized in freefall)
   在不熟悉的着陆区域或场外着陆（自由落体中错误的看点定位）时
   (6) other special considerations
   其他特别考虑因素

2. At the breakoff signal or upon reaching the breakoff altitude, each participant should:
在给出分离信号，或下落至分离高度时，各参与者应：
   a. turn 180-degrees from the center of the formation
   以编队中心为参考，转 180 度
   b. flat track away to the planned deployment altitude (flat tracking will achieve more separation than diving)
   平 Track，直至计划的开伞高度（平 Track 比俯冲能更有效地进行分离）
   （译者注：*平 Track，即 Flat Track，是一种前进速度较快，下降速率较慢，Tracking 轨迹相对于地面的角度较平坦的 Tracking*）

3. Opening「开伞」
   a. The pull should be preceded by a distinct wave-off to signal jumpers who may be above.
   开伞前应有明显的挥手示意动作，以向可能位于上方的跳伞者发出信号。
   b. During the wave-off, one should look up, down and to the sides to ensure that the area is clear.
   在挥手示意期间，应上下左右观察，确保附近空域内没有其他人。
   c. The low person has the right-of-way, both in freefall and under canopy.
   下方的跳伞者有优先通行权，无论是在自由落体过程中还是开伞后。

D. OTHER REFERENCES「其他参考资料」

1. See SIM Section 6-2, "Freeflying, Freestyle Skydiving, and Skysurfing Recommendations" for information about group flying in vertical orientations.
请阅读 SIM 第 6-2 节“自由飞、自由式和空中滑板”，以了解有关垂直姿态的自由落体编队的信息。

2. See SIM Section 6-4, "Night Jump Recommendations" for guidance on jumping in groups at night.
请阅读 SIM 第 6-4 节“夜间跳伞建议”，以了解夜间团体跳伞的指引。

6-2 自由飞、自由式和空中滑板 Freeflying, Freestyle and Skysurfing

A. THE SCOPE OF FREEFLYING「自由飞的定义范围」

1. These recommendations provide guidance for vertical freefall body positions, generally associated with significantly higher fall rates and rapid changes in relative speed.
   本节的建议可为以垂直姿态进行的自由落体提供指引，这些自由落体姿态通常下降速率很高，速度变化很快。
2. The diverse freefall speeds among jumpers engaged in different freefall activities affect separation between individuals and groups exiting on the same pass over the drop zone.
   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。
3. The term "freeflying" in this context is applied to all activities that incorporate back, standing, head-down, or sitting freefall positions, including freestyle and skysurfing.
   在本节中，"自由飞"指所有涉及背飞、站飞、倒飞或坐飞姿势的自由落体活动，包括自由式跳伞和空中滑板。

B. QUALIFICATIONS「资格」

1. Before engaging in freeflying, the skydiver should either:
   在进行自由飞之前，跳伞者应满足以下条件：
   a. hold a USPA A license
      持有 USPA A 执照
   b. receive freeflying instruction from a USPA instructional rating holder with extensive freeflying experience
      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
2. The skydiver should have demonstrated sufficient air skills, including:
   跳伞者应有足够的空中技能，包括：
   a. consistent altitude awareness
      持续的高度意识
   b. basic formation skydiving skills
      基本跳伞团体编队技能
   c. ability to track to achieve horizontal separation
      有足够的 Tracking 能力，以分开水平间隔距离
   d. understanding of the jump run line of flight
      理解跳伞航线的飞行路线
   e. proficiency in movement up, down, forward, backward, and rotation in a backfly position before attempting sit maneuvers.
      在尝试坐飞动作前，应熟练掌握背飞姿势下的向上、向下、向前、向后移动和旋转。
   f. proficiency in movement up, down, forward, backward, and rotation in a sit position before attempting a standing or head-down maneuvers.
      在尝试站飞或倒飞动作前，应熟练掌握坐飞姿势下的向上、向下、向前、向后移动和旋转。

C. EQUIPMENT「装备」

1. Gear must be properly secured to prevent premature deployment of either canopy.
   装备必须稳固保护好，以防止主伞或备伞过早意外打开。
   a. A premature opening at the speeds involved in this type of skydiving could result in severe injury to the body or stressing the equipment beyond limits set by the manufacturers.
      在这种类型的跳伞所涉及的高速下发生的过早意外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。

b. Deployment systems and operation handles should remain secure during inverted and stand-up flight; therefore, equipment for freeflying should include:
在倒飞和站飞的过程中，开伞系统和操作把手应稳稳地固定好；因此，自由飞的装备应包含以下配置：

(1) bottom-of-container mounted throw-out pilot chute pouch, pull-out pilot chute, or ripcord main deployment system
安装在伞包底部的抛出式引导伞收纳袋、或拉出式引导伞，或拉索式主伞开伞系统

(i) Exposed leg-strap-mounted pilot chutes present an extreme hazard.
外露的安装在腿带上的引导伞是极端危险的。

(ii) Any exposed pilot chute bridle presents a hazard.
任何外露的引导伞系带都会造成危险。

(iii) Use of a tuck-tab is recommended to provide additional security of the pilot chute during high freefall speeds encountered while freeflying.
建议引导伞配有 Tuck Tab，它在自由飞的高速自由落体速度下可为引导伞提供额外的安全保障。（*译者注：引导伞把手上的 Tuck Tab 可减小引导伞意外飞出的可能性*）

(2) closing loops, pin protection flaps, and riser covers well maintained and properly sized
关包绳、关包针挡盖和组提带挡盖维护良好、尺寸合适

2. Harness straps「背带」
   a. Leg straps should be connected with a seat strap to keep the leg straps from moving toward the knees while in a sitting freefall position or making transitions.
   两边腿带应用绳子或带子连住，以防止腿带在坐飞或坐飞的转换动作中向膝盖滑动。
   b. Excess leg and chest straps should be tightly stowed.
   腿带和胸带的富余长度部分应绑紧。
3. Automatic activation devices are recommended because of the high potential for collisions and loss of altitude awareness associated with freeflying.
   建议使用 AAD，因为进行自由飞时，跳伞者与其他跳伞者发生碰撞，以及丢失高度意识的可能性很大。
4. In the case of skysurfing boards, a board release system that can be activated with either hand without bending at the waist is recommended.
   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。
5. Personal accessories for freeflying should include:
   自由飞的个人附件应包括以下：
   a. audible altimeter (two are recommended)
   声音高度表（推荐使用两个）
   b. visual altimeter
   目视读数的高度表
   c. hard helmet
   坚固的头盔
   d. clothing or jumpsuit that will remain in place during inverted and stand-up freefall and will not obscure or obstruct deployment or emergency handles or altimeters
   在倒飞和站飞时仍能保持原位的衣服或连体服（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」

1. Freeflying has many things in common with face-to-earth formation skydiving.
   自由飞和面朝地面姿势的编队跳伞有许多共同点。
   a. A beginner will progress much faster and more safely with a coach.
   初学者在科目教练的指导下，进步会快得多，且更安全。

b. Novices should not jump with each other until—
新手们不应该一起跳伞，直到—
(1) receiving basic training in freeflying.
接受基本的自由飞培训。
(2) demonstrating ability to control movement up, down, forward and backward in a sitting position.
证明有能力来在坐飞的身体姿势下控制向上、向下、向前、向后的移动。

2. 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：新手和科目教练组成两人编队，以训练出舱、身体姿势、对接、姿态转换和分离的技能。

E. HAZARDS ASSOCIATED WITH GROUP FREEFLYING「与团体自由飞有关的危险」

1. Inadvertently transitioning from a fast-falling body position to a face-to-earth position ("corking") results in rapid deceleration from typically 175 mph to 120 mph.
从快速下落的姿势意外转换到面朝地的姿势（俗称"软木塞"）会导致迅速减速，通常从 175 英里/小时降至 120 英里/小时。
a. Freeflying in a group requires the ability to:
在团体中进行自由飞需要具备以下能力：
(1) remain in a fast-flying position at all times
始终保持高速飞行姿势
(2) remain clear of the airspace above other freeflyers
与其他自由飞跳伞者保持间隔距离
b. Assuming a fast-falling position when the other skydivers are in a slow-falling position puts the freeflyer below the formation, creating a hazard at break-off.
在其他跳伞者都使用慢速下落的姿势时，使用快速下落的姿势会使自由飞跳伞者落到编队下方，给分离造成危险。

2. Freeflying offers more potential for loss of altitude awareness than traditional skydiving for several reasons.
与传统的跳伞相比，自由飞更可能让跳伞者难以保持高度意识，原因如下：
a. Higher speeds mean shorter freefalls.
更高的速度意味着更短的自由落体时间。
(1) Face-to-earth freefall time from 13,000 feet to routine deployment altitudes takes about 60-65 seconds.
对于面朝地的姿势的自由落体，从 13000 英尺下落到常规的开伞高度大约需要 60-65 秒。
(2) Typical freefly times from 13,000 feet may be as short as 40 seconds.
对于典型的自由飞，从 13000 英尺高度开始的下落时间可能短至 40 秒。
b. Head-down and sit-fly positions present a different visual picture of the earth; freeflyers may not be visually aware of their altitude.
倒飞或坐飞身体姿势下看到的地面景象是不同的；自由飞跳伞者可能无法在视觉上意识到高度的高低。
c. Visual altimeters can be difficult to read in some body positions.
在某些身体姿势下，（目视读数的）高度表可能很难读数。
d. Audible altimeters can be hard to hear in the higher wind noise associated with freefly speeds.
自由飞的高速导致的高风噪可能使跳伞者很难能听到声音高度表。
e. As with other skydiving disciplines, participants must guard against focusing on an unimportant goal and losing track of the more important aspects of the skydive: time and altitude.
与其他类型的跳伞一样，参与者必须避免把注意力放在不重要的目标上，从而忽略跳伞运动中更重要的方面：时间和高度。

3. Horizontal drift「水平漂移」
   a. Novice freeflyers sometimes drift laterally in freefall.
      自由飞新手有时会在自由落体时发生横向偏移。
      (1) An experienced coach can correct the problem.
          有经验的科目教练可以纠正这个问题。
      (2) On solo jumps, freeflyers should practice movement perpendicular to the line of flight (90 degrees to jump run heading).
          在单人跳伞中，自由飞跳伞者应练习垂直于飞行路线的移动动作（90 度垂直于跳伞航线的航向）。
      (3) Separation from other groups can be enhanced by tracking perpendicular to the line of flight at a routine breakoff altitude.
          通过在常规分离高度处垂直于飞行路线进行 Tracking，可进一步增加与其他团体的间隔距离。
   b. Experienced freeflyers must also be aware of lateral movement when coaching novices or performing dives involving horizontal movement.
      经验丰富的自由飞跳伞者在指导新手时，或进行涉及水平移动的俯冲时，也必须注意横向的漂移。
   c. All skydivers on loads mixing freeflyers and traditional formation skydiving must consider the overall effect of the wind on their drift during freefall.
      如果一个架次上既有自由飞跳伞者，又有传统编队跳伞者，那么飞机上的所有跳伞者都必须考虑自由落体过程中风对漂移量的总体影响。
   d. As a general rule, faster-falling groups should leave after slower- falling groups particularly when jump run is flown against a strong headwind.
      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，特别是在跳伞航线上强逆风飞行时。
4. Faster-falling groups should delay canopy flight downwind and remain in position to allow jumpers who exited before them, but who fell slower, to deploy and then turn downwind also.
   下落速度较快的团体应推迟操作降落伞顺风飞行的时机，并保持位置，等待较早出舱但下落速度较慢的跳伞者开伞，然后再转向顺风飞行。
5. Loss of visual contact with other skydivers:
   其他跳伞者从视野中消失的问题：
   a. The rapid changes in vertical separation that can occur in freefly positions makes it easy to lose contact with others on the dive.
      自由飞时，跳伞者之间的垂直间距可能快速变化，使得在俯冲时很容易找不到彼此。
   b. Even jumpers with extensive experience in formation skydiving may have trouble locating everyone on a freefly dive.
      即使是在编队跳伞方面有丰富经验的跳伞者，也可能很难在自由飞俯冲中找到每个人。
   c. Breakoff can be more confusing than usual.
      分离可能比平时更混乱。
   d. Important considerations in planning a freefly dive are:
      规划自由飞俯冲时的重要考虑因素如下：
      (1) Keep the size of the groups small until proficient.
          团体应保持小规模，直到熟练。
      (2) Plan higher breakoffs than usual.
          分离高度要比平常更高。
      (3) Transition from fast-fall rate to normal tracking for separation gradually in case of a skydiver above the formation in a high-speed descent.
          从高速自由落体转换到正常的 Tracking 时，要慢慢转换，以防万一有跳伞者在编队上方进行高速下降（造成碰撞）。
      (4) Avoid maneuvers near breakoff that increase vertical separation.
          即将分离时，应避免进行会增加垂直间距的机动。

(5) It is as important to slow down after breakoff as it is to get separation from other jumpers.
分离后进行减速和与其他跳伞者分开距离同样重要。

6-3 自由落体下降速度和时间表 Freefall Rate of Descent and Time Table

A. A LOGGING AID「日志辅助」

1. The following table will assist in estimating the approximate amount of freefall time to be expected from a given altitude and in logging the correct amount of freefall time for a given jump.
   下表有助于估算从给定高度出舱的大致自由落体时间，用以在跳伞日志中记录某次跳伞的正确自由落体时间。
2. Each skydiver should log every jump made, including the amount of freefall time experienced.
   跳伞者都应记录好每一次跳伞，包括自由落体时间。
3. The amount of freefall time logged for each jump should be actual time.
   日志所记录的每次跳伞的自由落体时间应符合实际。

B. COMPUTATION「计算」

1. Many factors affect the rate of fall or terminal velocity in freefall.
   影响自由落体速度或终端速度的因素很多，如下示例：
   a. total weight of the jumper including equipment
      跳伞者穿上装备的总重量
   b. the surface area-to-weight ratio
      跳伞者表面积与重量的比值
   c. jumpsuit
      连体服（跳伞服）
   d. altitude above sea level (air density)
      海拔高度（空气密度）
   e. skydiving discipline, e.g., vertical orientations
      跳伞的内容，例如垂直姿态自由落体
2. The chart lists freefall times based on three different typical terminal velocities and provides an exit altitude reference for 3,000-foot openings.
   下表根据三个不同的典型的终端速度列出自由落体时间，并假定在 3000 英尺高度开伞。
   a. 120 mph (176 feet per second) for belly-to earth orientation
      120 英里/小时（176 英尺/秒）：腹部朝向地面的自由落体姿态
   b. 160 mph (235 feet per second) for vertical head-down or standing orientation
      160 英里/小时（235 英尺/秒）：垂直倒飞或站飞的自由落体姿态
   c. 50 mph (73.3 feet per second) for wing-suit jumps
      50 英里/小时（73.3 英尺/秒）：翼装飞行的速度
3. To determine the approximate amount of freefall time to expect on a jump and to log a realistic amount of freefall time for a jump, use the following procedures:
   若要预估某次跳伞自由落体消耗的大致时间，或在日志中记录某次跳伞的实际自由落体时间，请采取以下步骤：
   a. Determine your approximate terminal velocity by taking actual measurements of jumps with known exit and opening altitudes (this can be done by timing video tapes, by having someone on the ground time the skydive, or using a recording altimeter).
      对于已知出舱高度和开伞高度的某几次跳伞，通过测量实际的自由落体时间来确定大致终端速度（可通过视频计时、让某人在地面上计时，或使用有记录功能的高度表来完成）。
   b. Subtract your opening altitude from your exit altitude to determine the length of your freefall.
      用出舱高度减去开伞高度，以确定自由落体距离。
   c. Use the chart to estimate your freefall time according to your approximate terminal velocity and the distance in freefall.
      使用下表，根据大致终端速度和自由落体距离估算自由落体时间。

FREEFALL TIME TABLE 自由落体时间表				
Exit Altitude (feet) with opening at 3,000' **出舱高度（英尺）** **（假定 3000 英尺开伞）**	**Length of freefall (feet)** **自由落体距离（英尺）**	**Time of Freefall (with given terminal velocity)** **（不同终端速度下的）自由落体时间**		
		120 mph (horizontal) **120 英里/小时** **（水平身体姿态）**	**160 mph (vertical)** **160 英里/小时** **（垂直身体姿态）**	**50 mph (wingsuit)** **50 英里/小时** **（翼装）**
3,500	500	6	5	10
4,000	1,000	9	7	17
4,500	1,500	12	9	24
5,000	2,000	15	12	31
5,500	2,500	18	14	37
6,000	3,000	21	16	44
6,500	3,500	24	18	51
7,000	4,000	26	21	58
7,500	4,500	29	23	65
8,000	5,000	32	25	71
8,500	5,500	35	27	78
9,000	6,000	38	29	85
9,500	6,500	41	31	92
10,000	7,000	43	33	99
10,500	7,500	46	35	105
11,000	8,000	49	38	112
11,500	8,500	52	40	119
12,000	9,000	55	42	126
12,500	9,500	58	44	133
13,000	10,000	60	46	140
13,500	10,500	63	48	146
14,000	11,000	66	50	153
14,500	11,500	69	52	160
15,000	12,000	72	55	167
15,500	12,500	74	57	174

6-4 夜间跳伞 Night Jumps

A. WHY JUMP AT NIGHT?「为什么要进行夜间跳伞？」

1. Night jumps can be challenging, educational, and fun, but they require greater care on the part of the jumper, pilot, spotter, and ground crew.
   夜间跳伞（夜跳）具有挑战性、教育性和趣味性，但需要跳伞者、飞行员、看点定位的跳伞者和地勤人员更加专注。
2. As with all phases of skydiving, night jumping can be made safer through special training, suitable equipment, pre-planning, and good judgment.
   夜跳各阶段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。
3. 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，以学习或回顾以下知识技能：
   a. techniques of avoiding disorientation
      避免失去方向感的技巧
   b. use of identification light, lighted instruments, and flashlight
      信号标识灯、照明仪器和手电筒的使用
   c. target lighting
      着陆目标的照明
   d. ground-to-air communications
      地空通信方式
   e. reserve activation
      备伞的打开
4. To maintain safety and comply with FAA Regulations, any jumps between official sunset and official sunrise are considered as night jumps.
   为了维护安全并遵守联邦航空局的规定，日落到日出之间进行的任何跳伞都被视为夜跳。
5. 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.
   为完成执照申请要求，以及为打破世界记录而进行的夜跳，必须在日落后一小时到日出前一小时之间进行。

B. QUALIFICATIONS「资格」

1. Skydivers participating in night jumping should meet all the requirements for a USPA B or higher license.
   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。
2. Participants should complete a comprehensive briefing and drill immediately prior to the intended night jump.
   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。
   a. The training should be conducted by a USPA S&TA, Examiner, or Instructor, who has completed two night jumps.
      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。
   b. The training (including the date and location) should be documented in the jumper's logbook and signed by the USPA S&TA, Examiner, or Instructor.
      培训（包括日期和地点）应记录在跳伞者的日志中，并由 USPA 安全和培训顾问、考官或教练签字。

C. CHALLENGES「挑战」

1. Night jumps provide the challenge of a new and unusual situation that must be approached with caution because of:
   夜跳带来许多挑战，让跳伞者面对如下的新的特殊情形，因此必须小心对待：

a. the opportunity for disorientation
跳伞者可能失去方向感

b. the new appearance of the earth's surface and the lack of familiar reference points
地表外观陌生，缺乏熟悉的参照点

c. Vision and depth perception are greatly impaired by darkness.
视觉和判断深度的能力因黑暗而被明显削弱

d. Be thoroughly familiar with the effects of hypoxia (oxygen deprivation) on night vision (from the FAA Aeronautical Information Manual (AIM) online at faa.gov):
应完全了解缺氧对夜间视觉的影响（可参考联邦航空局的航空信息手册（AIM），联邦航空局网址为 faa.gov）：

(1) One of the first effects of hypoxia, evident as low as 5,000 feet, is loss of night vision.
缺氧导致的首要问题之一是夜视能力的丧失（5000 英尺就可以明显感觉到）。

(2) It takes approximately 30 minutes to recover from the effects of hypoxia.
从缺氧的影响中恢复过来大约需要 30 分钟。

(3) Smokers suffer the effects of hypoxia sooner than non- smokers.
吸烟者比不吸烟者更容易受到缺氧的影响。

(4) Carbon monoxide from exhaust fumes, deficiency of Vitamin A in the diet, and prolonged exposure to bright sunlight all degrade night vision.
飞机发动机尾气中的一氧化碳、缺乏维生素 A 的饮食、阳光下的长时间逗留，都会使夜视能力下降。

e. Night vision requires 30 minutes to fully adjust.
眼睛需要 30 分钟才能完全适应夜间视野。

2. A jumper's own shadow cast by the moon can resemble another jumper below and cause confusion.
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。

3. Skydivers infrequently make night jumps, and are less familiar with and less proficient in handling themselves under the conditions of this new environment.
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。

4. 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.
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」

1. A light visible for at least three statute miles displayed from opening until the jumper is on the ground (an FAA requirement for protection from aircraft)
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（联邦航空局对避开飞机的要求）

2. Lighted altimeter
带夜光的高度表

3. Clear goggles
干净清晰的护目镜

4. Jumper manifest
跳伞者名单

5. Flashlight to check canopy
用于检查降落伞的手电筒

6. Whistle
哨子

a. to warn other jumpers under canopy
用于开伞后警示其他跳伞者

b. for after landing to signal other jumpers
着陆后以向其他跳伞者示意
c. to aid rescuers in locating a lost or injured jumper
帮助救援人员找到失踪或受伤的跳伞者

7. Sufficient lighting to illuminate the target
充足的照明，以照亮着陆目标
a. Lighting can be provided by flashlights, electric lights, or such devices.
照明可由手电筒、电灯或此类装备提供。
b. Road flares or other pyrotechnics and open flames can be extremely hazardous and should not be used.
照明燃料棒、其他烟火和明火可非常危险，不应使用。
c. Automobiles can be used for lighting, but they clutter the landing area.
汽车可用于照明，但会使着陆区变得杂乱。

8. Cycle the automatic activation device to ensure it is within the time-frame operational limits for the night jump.
为了防止夜跳时 AAD 关闭，应在夜跳前重启 AAD。
（*译者注：AAD 会在使用一段时间后自动关闭，如 Cypres 和 Vigil 品牌的 AAD 使用 14 小时后会自动关闭*）

E. PROCEDURES「夜跳程序」

1. General「一般信息」
a. Night jumps should be conducted in light winds.
夜跳应在风速不高时进行。
b. visibility「能见度」
(1) Night jumps should be made only in clear atmospheric conditions with minimum clouds.
夜跳只能在云量最少的晴朗的天气条件下进行。
(2) Moonlight greatly increases visibility and night-jump safety.
月光可极大的增加能见度和夜跳的安全性。
c. advice and notification「建议和通知」
(1) Consult the local S&TA or a USPA Examiner for advice for conducting night jumps (required by the BSRs).
应咨询当地的安全和培训顾问或 USPA 考官，以获得关于夜跳的建议（基本安全要求）。
(2) Notify FAA, state, and local officials as required.
应按要求通知联邦航空局、州和地方官员。
d. 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.
应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一定高度的风况信息，计算跳伞航线的磁航向、出舱点和开伞点。
e. One senior member should be designated jumpmaster for each pass and be responsible for accounting for all members of that pass once everyone has landed.
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。
f. 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 during daylight conditions.
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。

2. Target configuration for accuracy:「为精准降落而对着陆目标进行布置：」
a. Arrange lights in a circle around the target area at a radius of 82 feet from the center.
应在以着陆目标为中心，半径 82 英尺的圆圈上布置灯光。

b. 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.
应将着陆目标下风处距离风线最近的三或四盏灯移开，并将它们排成一条朝向着陆目标的直线。
(1) This will indicate both wind line and wind direction.
这种布置可以指示风线和风向。
(2) By following a flight path over this line of lights, the jumper will be on the wind line and land upwind.
通过沿着这列灯光上方的飞行路线飞行，跳伞者可在风线上飞行并逆风着陆。

c. Place a red light at dead center, protected by a plexiglass cover flush with the surface.
应在圆圈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。

3. Emergency: Extinguish all lights in the event of adverse weather or other hazardous jump conditions to indicate "no jump."
紧急情况：在恶劣天气或其他危险的跳伞条件下应熄灭所有灯光，以表示"禁止跳伞"。

4. Ground-to-air radio communications should be available.
应有地空无线电通信方式。

5. Night Spotting:「夜间的看点定位：」
a. Current wind information for both surface and aloft conditions is critical at night.
在夜间，了解当前地面风和高空风的风况信息至关重要。
b. 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.
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。
c. The spotter should plan to use both visual spotting and aircraft instruments to assure accurate positioning of the aircraft.
看点定位的跳伞者应计划同时通过目视和飞机仪器进行看点定位，以确保飞机定位准确。
d. During the climb to altitude, familiarize each jumper with the night landmarks surrounding the drop zone.
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. GENERAL「一般建议」

1. A jumper making a first night jump should exit solo (no group skydiving).
第一次进行夜跳的跳伞者应单人出舱（不得进行团体跳伞）。

2. Strobe lights are not recommended for use in freefall, because they can interfere with night vision and cause disorientation.
频闪灯不建议在自由落体时使用，因为它可能会干扰夜间视觉并导致方向感迷失。
a. Constant lights are preferable.
最好使用恒定的光源。
b. Flashing lights can be used once the jumper has opened and is in full control under canopy.
一旦开伞且降落伞完全可控，就可以使用闪光信号灯。

3. Warning on pyrotechnics:「烟火使用的警告」
a. Road flares and other pyrotechnics exude hot melted chemicals while burning and are hazardous when used by skydivers in freefall.
照明燃料棒和其他烟火在燃烧时会渗出熔融的化学物质，对自由落体中的跳伞者造成危险。
b. In addition, the bright glare greatly increases the possibility of disorientation.
此外，明亮的眩光会大大增加失去方向感的可能性。

G. GROUP JUMPS: FREEFALL AND CANOPY「团体跳伞：自由落体和伞控」

1. Freefall「自由落体」

a. It is recommended that night relative work be planned for a full moon.
制定夜间团体编队跳伞计划时，建议把时间安排在满月的夜晚。

b. Skydivers should wear white or light-colored jumpsuits.
跳伞者应穿白色或浅色的连体服（跳伞服）。

c. A safe progression from a 2-way to larger formations should be made on subsequent night jumps.
团体编队人数应从 2 人起步，然后逐步安全地扩大编队规模。

d. Staggering the deployment altitudes can reduce the risk of a canopy collision
开伞高度错开可降低降落伞相撞的风险

(1) During deployment, in the event there is a lack of horizontal separation
在开伞过程中，水平间隔距离不足时

(2) During the canopy descent and landing pattern, when all canopies are converging above the landing area
在降落伞下降过程中和在着陆航线上，所有降落伞都集中在着陆区上方时

(3) The deployments should be staggered in order, with the lowest wing-loaded jumper deploying at the highest altitude, continuing in order until the highest wing-loaded jumper is deploying at the lowest altitude
应按顺序错开开伞。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

2. Under canopy:「开伞后：」

a. With others in the air, jumpers should fly predictably and avoid spirals.
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。

b. 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.
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。

3. Jumpers planning canopy formations should practice together during daylight and rehearse prior to boarding for each night jump.
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。

a. It is recommended that night canopy formation activity be performed during a full moon.
建议在满月期间进行夜间降落伞编队活动。

b. Brightly colored clothing should be worn by all jumpers.
所有的跳伞者都应穿着颜色鲜艳的衣服。

c. Lighting「照明」

(1) Constant beam lights are preferred.
最好使用恒定射灯。

(2) Strobes can interfere with night vision and depth perception.
频闪灯可能会干扰夜间视觉和对深度的判断能力。

6-5 水上降落 Water Landings

A. WHY JUMP IN THE WATER?「为什么进行水上降落（水降）？」

1. A number of fatalities have resulted from accidental water landings, usually because of the absence of flotation gear, use of incorrect procedures, and landing in extremely cold water.
   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、处理程序不正确，或降落在寒冷水域。
2. Water landing training is recommended to improve chances for survival from both intentional and unintentional water landings.
   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。
3. 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.
   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。
   a. Drownings are usually brought on by panic.
      溺水通常是由恐慌导致的。
   b. Proper training should decrease the likelihood of panic and therefore decrease the likelihood of a drowning.
      适当的培训可降低恐慌的可能性，从而降低溺水的可能性。
4. The potential always exists for unintentional water entry due to spotting error, radical wind changes, malfunctions, and landing under a reserve rather than a main.
   由于各种原因（如看点定位失误、剧烈的风向变化、降落伞故障导致使用备伞而不是主伞着陆等）导致意外落水的可能性总是存在的。
5. Intentional water jumps are preplanned jumps into a body of water.
   刻意水降指预先计划好在水域降落的跳伞。
   a. With a few additional precautions, a water jump can be the easiest and safest of all skydives.
      通过一些额外的预防措施，水上跳伞可以是所有跳伞类型中最简单、最安全的一种。
   b. Physical injuries and drownings are almost unknown on preplanned, intentional water landings.
      在预先计划的、刻意的水降中，几乎不存在受伤和溺水的事件。
6. These recommendations provide the USPA S&TA, Examiner, and Instructor with guidelines to train skydivers to effectively deal with water landings.
   本节的建议为 USPA 安全和培训顾问、考官和教练提供培训跳伞者有效应对水降的指南。
7. This section covers recommendations, procedures, and references for the following:
   本节涵盖以下方面的建议、程序和参考资料：
   a. training considerations for unintentional water landings
      意外水降的培训的考虑因素
   b. wet training for water landings, both unintentional and intentional
      刻意水降和意外水降的水上培训
   c. intentional water jumps
      刻意的水上跳伞

B. TRAINING FOR UNINTENTIONAL WATER LANDINGS「意外的水上降落培训」

1. In the USPA Integrated Student Program, training recommendations for unintentional water landings are included in the obstacle landing training of Category A (the first-jump course).
   在 USPA 综合学生计划中，意外水降的培训建议在 A 单元关于着陆障碍的培训中（第一跳课程）。
2. A more complete and detailed briefing outline is contained in SIM Section 5-1.F.
   SIM 5-1.F 中包含更完整和详细的简报大纲。

DRY (THEORETICAL TRAINING)「地面培训（理论培训）」

1. This training (including the date and location) should be documented in the student's logbook and A-license application or on a separate statement and signed by a USPA S&TA, Examiner, or Instructor.
   该培训（包括日期和地点）应记录在学生的日志和 A 执照申请中，或在单独的声明中记录，并由 USPA 安全和培训顾问、考官，或教练签字。
2. Theoretical training should include classroom lessons covering:
   理论培训的课堂内容应包括以下方面：
   a. techniques for avoiding water hazards
      避开水域的技巧
   b. 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
   c. preparation for water entry
      入水的准备
   d. additional risks of water landings in cold water temperatures
      在水温低的情况下水降的额外风险
   e. recovery after landing
      水降后的救援
3. Practice should combine both ground and training harness drills and should continue until the jumper is able to perform the procedures in a reasonable amount of time.
   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）」

1. Wet training「水上培训」
   a. should be conducted following a class on theory
      应在理论课程之后进行
   b. should take place in a suitable environment such as a swimming pool, lake, or other body of water at least six feet deep
      应在合适的环境中进行，如游泳池、湖泊或其他水深至少 6 英尺的水域上
   c. meets the USPA B license training requirements for intentional water landings
      符合 USPA B 执照的刻意水上降落的培训要求
2. This training (including the date and location) should be documented in the jumper's logbook and signed by a USPA S&TA, Examiner, or Instructor.
   该培训（包括日期和地点）应记录在跳伞者的日志中，并由 USPA 安全和培训顾问、考官，或教练签字。
3. Safety personnel should include properly trained and certified lifeguards.
   负责安全的人员应包括经过适当培训和认证的救生员。
   a. If suitably qualified skydivers are not available, assistance may normally be solicited from the local American Red Cross or other recognized training organization.
      如果没有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。
   b. Flotation gear and other lifesaving apparatus is recommended for non-swimmers.
      建议不会游泳的人使用飘浮装置和其他救生装备。
   c. Persons conducting this training need to consider the safety of the participants.
      进行该培训的人员需要考虑参与者的安全。
4. Review all theoretical and practical training.
   复习所有的理论和练习。
5. Initial training may be conducted in swimsuits, but final training is to be conducted in normal jump clothing to simulate a water landing.
   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服来模拟水上降落。
   a. Non-swimmer: Training is to include basic skills covering breath control, bobbing, and front and back floating.

不会游泳的人：培训内容应包括呼吸控制、水中上下浮动、头朝上或背朝上浮在水面上等基本技能。

b. Swimmer: Training is to include all of the above, plus the breast stroke, side stroke, back stroke, and treading water.
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。

6. While wearing a parachute harness and container system and all associated equipment, jump into the water.
跳入水中时，需要穿着降落伞背带和伞包系统，以及所有相关装备。
   a. The USPA Instructor should then cast an open canopy over the jumper before any wave action subsides.
然后，USPA 教练应在水浪减弱之前，在跳伞者上方盖下一个打开的降落伞。
   b. Any type of canopy may be used.
可以使用任何降落伞类型。
   c. The jumper should then perform the steps necessary to escape from the equipment and the water.
然后，跳伞者应执行离开装备和水中逃生所需的步骤。
   d. Repeat this drill until proficient.
重复练习，直到熟练。

C. INTENTIONAL WATER LANDINGS「刻意的水上降落」

1. Any person intending to make an intentional water landing should:
任何打算进行刻意水降的人应满足以下条件：
   a. undergo preparatory training within 60 days of the water jump
水上跳伞前 60 天内进行预备培训
      (1) The training should be conducted by a USPA S&TA, Examiner, or Instructor.
培训应由 USPA 安全和培训顾问、考官，或教练进行。
      (2) The training(including the date and location) should be documented in the jumper's logbook and signed by a USPA S&TA, Examiner or Instructor.
培训（包括日期和地点）应记录在跳伞者的日志中，并由 USPA 安全和培训顾问、考官，或教练签字。
   b. hold a USPA A license and have undergone wet training for water landings
持有 USPA A 执照并接受过水降的水上培训
   c. be a swimmer
会游泳
2. Theoretical training should include classroom lessons covering:
理论培训的课堂内容应包括以下方面：
   a. preparations necessary for safe operations
安全跳伞的必要准备
   b. equipment to be used
将要使用的装备
   c. procedures for the actual jump
跳伞的实际程序
   d. recovery of jumpers and equipment
跳伞者的接回和装备的回收
   e. care of equipment
装备的维护
3. Preparation「准备」
   a. Obtain advice for the water jump from the local USPA S&TA or Examiner(required by the BSRs).
获得当地 USPA 安全和培训顾问或考官关于的水上跳伞的建议（基本安全要求）。
   b. Check the landing site for underwater hazards.
检查降落地点的水下是否有危险障碍物。
   c. Use an altimeter for freefalls of 30 seconds or more.

如果自由降落时间为 30 秒或以上，建议使用高度表。

d. Provide no less than one recovery boat per jumper, or, if the aircraft drops one jumper per pass, one boat for every three jumpers.
为每名跳伞者应提供不少于一艘救援船，或者，如果飞机每批次只投放一名跳伞者，则为每三名跳伞者应提供一艘救援船。

e. Boat personnel should include at least one qualified skydiver and stand-by swimmer with face mask, swim fins, and experience in lifesaving techniques, including resuscitation.
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。

f. Each jumper should be thoroughly briefed concerning the possible emergencies that may occur after water entry and the proper corrective procedures.
每名跳伞者应全面了解落水后可能发生的紧急情况和其正确的处理程序。

g. opening altitude「开伞高度」
   (1) Jumpers should open no less than 3,000 feet AGL to provide ample time to prepare for water entry.
   跳伞者应在离地高度 3000 英尺以上开伞，以有充足的时间准备入水。
   (2) This is especially true when the DZ is a small body of water and the jumper must concentrate on both accuracy and water entry.
   当降落区域是面积小的水域，跳伞者必须把注意力集中在精准度和入水上时，这尤其重要。

h. A second jump run should not be made until all jumpers from the first pass are safely aboard the pickup boat(s).
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。

4. After canopy inflation: In calm conditions with readily accessible pick-up boats, the best procedure is simply to inflate the flotation gear and concentrate on landing in the proper area.
降落伞充气后：风速低，且有随时能接跳伞者的船只时，最佳的水降程序就是给飘浮装置充气，并把注意力集中在如何在合适区域内降落。

5. Landing「着陆」
   a. 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.
   在强风、波涛汹涌的条件下，在水降竞赛项目中，或者如果飘浮装置无法充气，则必须在落水后脱离装备。
   b. Instruments:「器械」
      (1) Water may damage some altimeters and automatic activation devices.
      入水可能会损坏某些高度表和 AAD。
      (2) Skydivers jumping without standard instruments and AADs should use extra care.
      如无标准配备的器械和 AAD，跳伞应格外小心。

D. HIGH-PERFORMANCE LANDINGS IN WATER「水上的高性能降落」

1. Water may reduce injuries for jumpers who slightly misjudge high-performance landings, but jumpers have been seriously injured or killed after hitting the water too hard.
在进行高性能着陆时，如果发生误判，水可以减少受伤概率，但曾有案例中，跳伞者落水冲击过猛导致严重受伤或死亡。

2. Jumpers should obtain coaching from an experienced high-performance canopy pilot familiar with water hazard approaches and contact prior to attempting high-performance landings across water.
尝试高性能水降之前，跳伞者应受到经验丰富的、熟悉水降的进近和入水的方法的高性能伞控跳伞者的指导。

3. Raised banks at the approach entry and exit from the body of water present a serious hazard.
位于进近开始点和结束点的凸起的堤岸会带来严重的危险隐患。

4. An injury upon landing in a water hazard can increase the jumper's risk of drowning, so high-performance landings involving water should be approached with the standard water landing precautions, including the use of

a flotation device.
水降时受伤可能会增加跳伞者溺水的风险，因此，水上高性能降落应采取标准的水降预防措施，包括使用漂浮装置。

5. 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.
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「水上跳伞的安全检查和简报」

1. A complete equipment check should be performed with particular attention to any additional equipment to be used or carried for the water jump (refer to SIM Section 5-4 on equipment checks).
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（请参考 SIM 5-4 关于装备检查的内容）。
2. Boat and ground crew briefings:
船只和地勤人员简报：
   a. communications procedures (smoke, radio, buoys, boats)
   通信程序（信号烟雾、无线电、浮标、船只）
   b. wind limitations
   风速限制
   c. jump order
   跳伞顺序
   d. control of spectators and other boats
   观众和其他船只的管控
   e. setting up the target
   着陆目标的布置
   f. maintenance of master log
   主日志的维护
   g. 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）

6-6 降落伞编队 Canopy Formations

A. WHAT IS CANOPY RELATIVE WORK?「什么是降落伞编队？」

1. Canopy Formation (CF) is the name of the competition discipline for the skydiving activity commonly called canopy relative work (CRW) or "crew."
   降落伞编队是跳伞比赛科目的名称，英文简称 CRW 或 CREW。
2. Canopy formations are built by the intentional maneuvering of two or more open parachute canopies in close proximity to or in contact with one another during flight.
   降落伞编队是通过两个或多个打开的降落伞在飞行过程中刻意地接近或接触来建立的。
3. The most basic canopy formation is the joining of two canopies vertically during flight as a stack or plane (compressed stack).
   最基本的降落伞编队是两个降落伞在飞行过程中在垂直方向上连接成堆叠式编队（Stack）或平面式编队（Plane，比堆叠式编队压得更紧）。
4. Canopy formations, both day and night, may be accomplished by experienced canopy formation specialists leading the dives.
   无论白天还是晚上跳伞，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. GENERAL「一般建议」

1. This section recommends procedures considered by canopy formation specialists to be the safest and most predictable, as well as productive.
   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。
2. The concept of canopy relative work is that of smooth flow and grace between two or more jumpers and their canopies in flight.
   降落伞编队的概念：两个或多个的跳伞者及其降落伞之间的流畅和优雅的飞行。
3. Jumper-to jumper collisions or hard docks that result in deflated canopies or entanglements can result in serious injury or death.
   跳伞者相撞以及会导致降落伞塌缩或缠绕的过猛的对接，可能会导致重伤或死亡。

C. QUALIFICATIONS AND INITIAL TRAINING「资格和最初的培训」

1. Before engaging in canopy formations, a jumper should have:
   在进行降落伞编队飞行之前，跳伞者应：
   a. thorough knowledge of canopy flight characteristics, to include riser maneuvers and an understanding of the relative compatibility of various canopies
      全面了解降落伞的飞行特性，包括组提带机动，以及各种降落伞的飞行特性的相似度的理解
   b. demonstrated accuracy capability of consistently landing within 16 feet of a target
      证明有精准降落的能力，能连续在距离着陆目标 16 英尺的范围内着陆
2. For the first few jumps, begin with stacks and planes, as offset formations are less stable.
   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*）
3. Initial training should be conducted with two jumpers—the beginner and a canopy formation specialist—and include lessons in basic docking, break-off procedures, and emergency procedures.
   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。

D. EQUIPMENT「装备」

1. 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至关重要：
   a. hook knife—necessary for resolving entanglements
      伞刀—解决缠绕问题的必要工具
   b. ankle protection「脚踝保护」
      (1) Adequate socks prevent abrasion from canopy lines.
      合适的袜子，防止伞绳带来的擦伤。
      (2) If boots are used, cover any exposed metal hooks.
      如果穿靴子，应遮盖住任何外露的金属钩子。
   c. gloves for hand protection
      手套，以保护手
   d. Self-retracting or removable pilot chute bridle systems are recommended.
      建议使用可缩或可拆下的引导伞系统。
   e. cross connectors「组提带连接带」
      (1) A secure foothold at the top of the risers is essential for building planes, which can develop greater tension as they grow larger.
      组提带连接带可在组提带顶部提供一个稳固的立足点，这对于构建平面编队至关重要，随着编队变大，连接带的拉力可能会更大。
      (2) Cross connectors should be attached between the front and rear risers only, not from side to side.
      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。
      (3) Side-to-side cross connectors can snag on the reserve container during deployment and cause a dangerous entanglement.
      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*）
2. The following items are strongly recommended for safely building canopy formations:
   为安全地建立降落伞编队，强烈建议使用以下装备：
   a. altimeter—provides altitude information for dock, abort, and entanglement decisions
      高度表—提供高度信息，在对接、放弃建立编队和发生缠绕时的可供参考
   b. protective headgear—should allow adequate hearing capability for voice commands in addition to collision protection
      保护效果好的头盔—除了缓冲碰撞外，还不应太阻碍听觉，以让跳伞者能听到口令
   c. long pants and sleeves for protection from line abrasions
      长裤和长袖，以防止伞绳擦伤
   d. extended or enlarged toggles that can be easily grasped
      加长或加大的、容易抓握的刹车棒
   e. cascades——recommended to be removed from the two center A lines, which should be marked in red
      伞绳汇聚点——建议移除中间两条 A 线的伞绳汇聚点，中间两条 A 线应该是红色标记的。

E. RULES OF ENGAGEMENT「参与降落伞编队的规则」

1. Weather considerations:「天气注意事项：」
   a. Avoid jumping in turbulent air or gusty wind conditions.
      应避免在乱流或阵风条件下跳伞。
   b. Early morning and early evening jumps are recommended in areas subject to thermal turbulence and other unstable air conditions.
      如果跳伞的地区容易受到热致乱流和其他不稳定气流条件影响，建议清晨和傍晚进行跳伞。

c. Avoid passing near clouds, which are associated with unpredictable air conditions.
避免在云附近经过，云附近的气流条件通常不可预测。

d. Use caution in flying formations over plowed fields, paved surfaces, or other areas where thermal conditions often exist.
在犁田、硬化路面或其他经常存在热对流条件的区域上空进行降落伞编队跳伞时要小心。

e. When encountering bumpy or unexpected turbulent air, it is recommended that all efforts be made to fly the formation directly into the wind.
当遇到颠簸的空气或意外的乱流时，建议尽力使编队正逆风飞行。

2. Factors that must be considered in every pre-jump briefing include:
每次跳伞前的简报必须考虑到以下方面：

a. exit order
出舱顺序

b. time between exits
出舱间隔

c. length of freefall
自由落体时长

d. designation of base-pin
指定作为基准的跳伞者（Base，下文称“基准”），以及首个与基准进行对接的跳伞者（Pin，下文称“二号跳伞者”或“二号”）

e. canopy wing loading and trim
降落伞的翼载和伞绳长度的调整

f. order of entry
加入编队的顺序

g. direction of flight and techniques of rendezvous
飞行方向和会合技巧

h. approach and breakoff traffic patterns
接近和分离的交通航线

i. docking procedures
对接程序

j. formation flight procedures
编队飞行程序

k. one-word verbal commands
单字口令

l. breakoff and landing procedures
分离和着陆程序

m. emergency procedures
紧急程序

3. Exit and opening procedures:
出舱和开伞程序

a. Spotting procedures should allow for upper-wind velocity and direction.
看点定位应考虑到高空风速和风向的影响。

b. The aircraft pilot should be advised that a canopy formation group is exiting and opening high.
应通知飞行员，有降落伞编队团体正在出舱，并且要高开。

c. Exits should be made at one- to three-second intervals.
出舱间隔 1 到 3 秒钟。

d. Any opening delay should be adequate to assure clearance from the aircraft, jumper separation, and stable body position at opening.

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。

e. Each jumper must be prepared to avoid a collision at any time upon leaving the aircraft.
跳伞者须随时做好准备，避免在出舱后发生碰撞。

4. Docking procedures「对接程序」
   a. base-pin「基准和二号」
      (1) This position requires the most expertise of all; however, these skills are used in all slots.
      作为基准和二号的跳伞者的知识技能水平要求最高，但这些知识技能同样适用于其他位置的跳伞者。
      (2) Discuss the methods to be used to dock before boarding the aircraft.
      应在登机前讨论拟使用的对接方法。
   b. Formation flight course: It is important that the formation pilot maintain a constant direction of flight along a predetermined course.
   编队飞行路线：必须保持沿预定航线方向飞行，这很重要。
   c. Traffic patterns: Establish an orderly flight pattern for canopies attempting to dock.
   交通航线：试图对接的降落伞应采用有序的飞行航线。
      (1) An orderly pattern will enable approaches to be made without interference and lessen the possibility of canopy collisions.
      有序的航线可保证跳伞者接近编队时不会干扰编队，并减少发生降落伞碰撞的可能性。
      (2) 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.
      不得在编队前面飞过；降落伞产生的尾流乱流会干扰编队的稳定性，可能会导致非常危险的情况。
   d. Approaches:「接近」
      (1) For smoothness and safety, each person entering the formation after base-pin should enter from behind and below, never crossing from one side of the formation to the other.
      为了顺利安全对接，在基准和二号跳伞者之后加入编队的跳伞者，都应从后方和下方进入，不得从编队的一侧穿到另一侧。
      (2) Moderate angles of approach are recommended
      建议以适中的角度接近。
   e. Docking:「对接」
      (1) Only the center section of a docking canopy should be grasped when the canopy closes third or later in a stack formation.
      进行堆叠式编队飞行时，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。
      (2) To complete the stack dock, the top jumper places both feet between both A lines of the center cell of the lower jumper and hooks one by each instep.
      为了进行堆叠式编队的对接，上方跳伞者应将双脚放在下方降落伞中心气室的两条 A 线的之间，并用足背各钩住一条 A 线。
      (3) A center cell dock is preferred for beginners.
      对于初学者来说，最好通过中心气室对接。
   f. Collapses:「降落伞塌缩」
      (1) Improper docks are the most common cause of collapsed canopies.
      不正确的对接是造成降落伞塌缩的最常见原因。
      (2) Collapsed canopies should be released to allow reinflation only if it will not make the situation worse.
      只有在不会使情况恶化的情况下，才应释放已塌缩的降落伞以使其重新充气。
      (3) To prevent dropping an entangled jumper into a potential collision, make sure the area behind and below is clear.
      为防止被缠绕的跳伞者下落后发生碰撞，应确保后方和下方的区域是空旷的。

(4) Experienced participants may be able to reinflate a collapsed canopy by continuing to plane down the lines.
经验丰富的跳伞者可能能够通过继续沿着伞绳移动，压紧编队来重新让塌缩的降落伞充气。

(5) The jumper with the collapsed canopy can try using brakes or rear risers to back the canopy off and reinflate it.
发生降落伞塌缩的跳伞者可以尝试使用刹车棒或后组提带来让伞相对后移以使其重新充气。

(6) The term "drop me" should be used by a jumper wishing to be released from the formation.
想从编队中被释放的跳伞者应喊口令"放下我"（drop me）。

(i) This command is to be obeyed immediately, unless it will drop the jumper into a worse situation.
该口令必须立即执行，除非会让被释放的跳伞者的情况恶化。

(ii) The jumper issuing the command should be sure to check behind for other canopies on approach before asking to be dropped.
发出口令的跳伞者在要求被释放前，应检查确保后方是否有正在接近的其他降落伞。

5. Formation flight procedures:「降落伞编队飞行程序」

a. Verbal commands should be concise and direct.
口令应简洁直接。

b. There should be no non-essential conversation.
杜绝不必要的沟通。

c. The pilot should fly the formation with limited control movements to minimize oscillations and facilitate docking.
跳伞者应通过有限的机动来进行编队飞行，尽量减少晃动，以便对接。

d. The formation pilot should never use deep brakes in the formation.
不得在编队中使用深刹车。

e. Oscillations「晃动」

(1) Oscillations are a primary concern in canopy formations, because they can result in collapsed canopies and entanglements.
晃动是降落伞编队的一个主要问题，可能会导致降落伞塌缩和缠绕。

(2) To reduce their effect and frequency, jumpers in the formation can—
为了减少晃动的影响和频率，编队中的跳伞者可以采取如下措施—

(i) 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

(ii) maintain an arch
身体采取弓形姿势

(iii) if on the bottom, apply the appropriate control to reduce or increase tension
如果处于编队底部，可采取适当的控制来减少或增加拉力

(iv) 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

(v) drop the bottom jumper before the oscillation develops into something worse
在晃动恶化前释放下方跳伞者

6. Diamonds and offsets「钻石形编队和偏置编队」

a. Diamonds and offsets require different flying techniques from vertical formations.
钻石形编队和降落伞对称轴不在同一垂直平面的编队需要不同于垂直编队的飞行技巧。

b. It is imperative to get properly trained before attempting them.
在尝试之前，跳伞者必须经过适当的培训。

7. Breakoff and landing procedures:「分离和着陆程序」

a. Approaches and docking should stop no lower than 2,500 feet AGL.
编队的接近和对接应在离地高度 2500 英尺以上停止。

b. Formation pilots should avoid all obstacles, including suspected areas of thermal activity, such as paved surfaces, plowed fields, buildings, etc.
编队成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。

c. The landing of canopy formations should be attempted by only those with a high level of CRW proficiency.
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。

d. Breakoff for landing should take place no lower than 2,500 feet AGL because of the danger of entanglement at breakoff time.
着陆前的分离应不低于离地高度 2500 英尺，因为分离时有缠绕的危险。

e. Jumpers should not attempt to land formations in high or gusty winds, high density altitudes, or high field elevations.
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。

f. CRW groups landing off the airport should try to land together.
在机场外着陆的降落伞编队成员应尽量靠近着陆。

F. EMERGENCY PROCEDURES:「紧急程序：」

1. Entanglements are the greatest hazards when building canopy formations.
在建立降落伞编队时，缠绕是最大的危险。

2. Jumpers should know their altitude at all times, because altitude will often dictate the course of action.
跳伞者应随时知道自己的高度是多少，因为高度经常决定行动。

3. If a collision is imminent:「如果即将发生碰撞」
   a. The jumpers should spread one arm and both legs as wide as possible to reduce the possibility of penetrating the suspension lines, provided the suspension lines are made from larger diameter Dacron©.
   如果伞绳直径较大，且是 Dacron 材质，则跳伞者应尽可能地伸展一只手臂和双腿，以减少穿过伞绳的可能性。
   b. The other hand is used to protect the reserve ripcord.
   另一只手用来保护备伞开伞拉索。
   c. Canopies with small diameter suspension line, such as Spectra or HMA, can lead to more serious injuries during a collision than canopies using larger diameter suspension lines made from Dacron©.
   比起采用 Dacron 材质的直径较大的伞绳的降落伞，采用直径较小的伞绳（如 Spectra 或 HMA 材质的伞绳）的降落伞在碰撞过程中可能会导致更严重的受伤。
      (1) Jumpers should tuck in arms, legs and head if the collision involves canopies with small diameter suspension lines
      如果碰撞涉及到带有小直径伞绳的降落伞，则跳伞者应收起双臂、双腿和头部。
      (2) Avoid hitting the suspension lines or other jumper, if at all possible.
      如果可能的话，尽可能避免撞到伞绳或跳伞者。

4. Jumpers should be specific in discussing their intentions.
跳伞者在传达意图时应特别明确。

5. If altitude allows, emergency procedures should proceed only after acknowledgment by other jumper(s).
如果高度允许，只有在其他跳伞者认可后才能执行紧急程序。

6. In the event of multiple cutaways and if altitude allows, jumpers should stagger reserve openings to avoid possible canopy collisions.
在多人切伞的情况下，如果高度允许，跳伞者应错开打开备伞，以避免潜在的降落伞碰撞。

7. Respond to the given situation.
特定情况的应对

a. When entanglements occur, jumpers must be prepared to react quickly and creatively.
发生缠绕时，跳伞者必须准备好快速和创造性地应对它。

b. In many cases, the emergency is one that can't be prepared for in advance; it may even be a problem no one imagined could happen.
在许多情况下发生的紧急情况是跳伞者没有为之做过准备的；甚至可能会发生某种没人设想过的问题。

8. If the entanglement occurs with sufficient altitude, the jumpers should attempt to clear the entanglement by following lines out before initiating emergency procedures.
发生缠绕时如果高度足够高，在启动紧急程序之前，跳伞者应尝试穿出伞绳来解除缠绕。

9. Jumpers should try to land together following a canopy relative work emergency.
降落伞编队发生紧急情况后跳伞者应尽量一起着陆。

G. NIGHT CANOPY FORMATIONS「夜间降落伞编队」

See SIM Section 6-4, “Night Jump Recommendations,” for guidance.
请参阅 SIM 6-4 中关于夜跳的建议，以获取指引。

6-7 高海拔和氧气使用 High Altitude and Oxygen Use

A. PREPARATION AND PLANNING CRITICAL「准备和规划至关重要」

1. Skydives from altitudes higher than 15,000 feet above mean sea level (MSL) present the participants with a new range of important considerations.
   海拔 15000 英尺以上高空的跳伞需要参与者考虑一系列新的重要因素。
2. The reduced oxygen, lower atmospheric pressure and temperature, and the higher winds and airspeed above 15,000 feet MSL make skydiving more hazardous in this region than at lower altitudes.
   海拔 15000 英尺以上，氧气的减少、更低的气压和温度、更高的风速和空速，使得在该区域跳伞比在较低的高度跳伞更危险。
3. Hypoxia, or oxygen deficiency, is the most immediate concern at higher altitudes.
   在高海拔，缺氧是首先要面对的问题。
   a. Hypoxia can result in impaired judgment and even unconsciousness and death.
      缺氧可能会导致判断力下降，甚至失去知觉和死亡。
   b. Hypoxia can be prevented by the use of supplemental oxygen and procedures not required for skydives from lower altitudes.
      缺氧的发生可以通过使用补充氧气和遵循一定程序来预防，这些程序对于低海拔高度跳伞时是非必要的。
4. With proper training, adequate equipment, and well-planned procedures, high altitude skydives can be conducted within acceptable safety limits; without such precautions, they may result in disaster.
   通过适当的培训、合适的装备和精心规划的程序，高海拔跳伞可以在可接受的安全范围内进行；没有这些预防措施，高海拔的跳伞可能会导致灾难性后果。

B. SCOPE「内容范围」

1. These recommendations are presented to familiarize skydivers with:
   本节的建议是为了让跳伞者熟悉以下内容：
   a. altitude classifications
      高度的分类
   b. experience recommendations
      经验的建议
   c. training recommendations
      培训的建议
   d. equipment recommendations
      装备的建议
   e. procedural recommendations
      程序的建议
2. General information is provided on the accompanying Planning Chart.
   一般信息可在随附的规划图表中找到。

C. ALTITUDE CLASSIFICATIONS「高度的分类」

1. Low altitude: below 15,000 feet MSL
   低海拔：海拔 15000 英尺以下的高度
2. Intermediate altitude: from 15,000 feet up to 20,000 feet MSL
   中等海拔：从海拔 15000 英尺到 20000 英尺的高度
3. High altitude: from 20,000 feet up to 40,000 feet MSL
   高海拔：从海拔 20000 英尺到 40000 英尺的高度

4. Extreme altitude: above 40,000 feet MSL
   极端海拔：海拔 40000 英尺以上的高度

D. EXPERIENCE RECOMMENDED「建议的经验水平」

1. For intermediate-altitude jumps(15,000-20,000 feet MSL), participants should hold at least a USPA B license and have made 100 jumps.
   为了能够进行中等海拔跳伞（海拔 15000 至 20000 英尺），参与者应至少持有 USPA B 执照，并跳过 100 次伞。
2. For high-altitude jumps(20,000- 40,000 feet MSL), participants should:
   为了能够进行高海拔跳伞（海拔 20000 至 40000 英尺），参与者应满足以下条件：
   a. hold a USPA C license
      持有 USPA C 执照
   b. have made at least one jump from 15,000 feet MSL or below using the same functioning bailout oxygen system
      已从海拔 15000 英尺或以下跳过至少一次伞，且在该次跳伞中实际使用了与高海拔跳伞相同的紧急供氧系统
3. For extreme-altitude jumps(40,000 feet MSL and higher), participants should:
   为了能够进行极端海拔跳伞（海拔 40000 英尺及以上），参与者应满足以下条件：
   a. hold a USPA D license
      持有 USPA D 执照
   b. have made at least two jumps from below 35,000 feet MSL using the same functioning bailout oxygen and pressure systems
      已从海拔 35000 英尺以下跳过至少两次伞，且在该两次跳伞中实际使用了与极端海拔跳伞相同的紧急供氧系统

E. TRAINING RECOMMENDATIONS「培训的建议」

1. It is a benefit for participants on intermediate-altitude skydives to have completed physiological flight training (PFT) within the preceding 12 months.
   在中等海拔跳伞前 12 个月内完成飞行生理培训（PFT）对中等海拔跳伞的参加者是很有用的。
2. It is essential for all participants on high- and extreme-altitude skydives to have completed PFT within the preceding 12 months.
   所有高海拔和极端海拔跳伞的参与者都必须在跳伞之前 12 个月内完成飞行生理培训。
3. PFT availability:「可提供飞行生理培训的培训地点」
   a. The FAA's Civil Aerospace Medical Institute offers a one-day aviation physiology course at the Mike Monroney Aeronautical Center site in Oklahoma City, OK with a hypobaric chamber that creates high-altitude and rapid-decompression scenarios.
      联邦航空局民用航空医学研究所（地址：俄克拉荷马州俄克拉何马城迈克·蒙罗尼航空中心）可提供为期一天的航空生理学课程，用低气压室来模拟高海拔和快速减压的场景。
   b. Additional locations run by private companies are available in various locations across the U.S.
      在美国各地也有由私营企业经营的其他培训点。
   c. To attend training, applicants for PFT must hold at least a current FAA class 3 medical certificate.
      为能参加培训，飞行生理培训课程的申请者必须至少持有当前有效的联邦航空局三级医学证书。
4. The PFT course:「飞行生理培训课程：」
   a. familiarizes the skydiver with the problems encountered in the high- altitude environment
      让跳伞者熟悉高海拔环境中会遇到的问题
   b. introduces basic high-altitude oxygen and pressure equipment and its use
      介绍基本的高海拔氧气装备和压力装备及其使用方法

c. provides the opportunity to discover individual reactions to hypoxia and other altitude diseases through simulated high-altitude flights in a decompression chamber
通过减压舱模拟高海拔飞行，可测试个人对缺氧和其他高海拔疾病的反应

5. Applications:「申请流程：」
   a. First, view the CAMI web site at: www.faa.gov/pilots/training/airman_education/aerospace_physiology/
   首先，请查看民用航空医学研究所的网站：
   www.faa.gov/pilots/training/airman_education/aerospace_physiology/
   b. Directions and enrollment instructions can be found at:
   www.faa.gov/pilots/training/airman_education/aerospace_physiology/cami_enrollment/
   指引和课程注册说明可在以下网址找到：
   www.faa.gov/pilots/training/airman_education/aerospace_physiology/cami_enrollment/

F. RECOMMENDED EQUIPMENT「建议的装备」

1. General:「一般信息」
   a. A sensitive altimeter and adequate protective clothing are recommended for skydives from above 15,000 feet MSL in addition to the oxygen and body pressurization equipment listed below.
   除了以下列出的氧气和身体加压装备外，建议在海拔 15000 英尺以上进行高空跳伞时使用灵敏的高度表和保护力充足的防护服装。
   b. In the event of a malfunction in the primary systems and components, backup oxygen systems and components should be available on board the aircraft.
   如果主系统和部件出现故障，飞机上应有备用氧气系统和部件。
2. Intermediate-altitude jumps: A separate oxygen mask should be provided for each skydiver and aircrew member, although a common central oxygen bottle and regulator system may be used.
中等海拔跳伞：每名跳伞者和机组成员都应配有单独的氧气面罩，尽管可使用共用的中央氧气瓶和调节系统。
3. High-altitude jumps:「高海拔跳伞：」
   a. All skydivers must be equipped with an appropriate on-board oxygen source and compatible bailout oxygen system, preferably with a backup bottle (see Planning Chart following this section).
   所有跳伞者必须配备适当的机载氧气源和兼容的紧急供氧系统，最好配备备用氧气瓶（请参考本节后部的规划图表）。
   b. An automatic activation device(AAD) is recommended.
   建议使用 AAD。
4. Extreme-altitude jumps:「极端海拔跳伞」
   a. All skydivers must be equipped with compatible on-board and bailout oxygen and body pressurization systems appropriate to the goal altitude(see Planning Chart following this section).
   所有跳伞者必须配备适用于目标高度的、互相兼容的机载供氧和紧急供氧系统以及身体加压系统（请参考本节后部的规划图表）。
   b. An AAD is recommended.
   建议使用 AAD。

G. RECOMMENDED PREPARATIONS「建议的准备工作」

1. General:「一般信息」
   a. All jumps must be coordinated in advance with the appropriate local, state, and federal aviation authorities.
   所有此类跳伞活动必须预先与相应的地方政府、州政府和联邦航空当局协调。
   b. All jumps should be coordinated in advance with USPA for safety and for establishing new national and international skydiving records under the FAI Sporting Code.
   所有此类跳伞活动都应预先与 USPA 协调，以保障安全，并便于根据 FAI 运动规则记录新的国家和国际跳伞纪录。

2. Oxygen monitor:「氧气观察员」
   a. For group jumps from above 15,000 feet MSL, it is helpful to appoint an oxygen monitor whose duties are to:
   对于海拔 15000 英尺以上高空的团体跳伞，建议指定一名氧气观察员，其任务如下：
      (1) inspect, operate, and monitor the oxygen systems during their use
      在使用过程中检查、操作和监测氧气系统
      (2) watch for symptoms of hypoxia and other altitude diseases in all jumpers
      注意所有跳伞者的状态，以发现缺氧和其他高海拔疾病症状
      (3) initiate appropriate remedial measures in the event of oxygen equipment malfunction or jumper illness
      在出现氧气装备故障或跳伞者身体状态异常的情况下，采取适当的补救措施
      (4) see that oxygen equipment is properly stowed before exit
      确保在出舱前氧气装备已适当固紧
   b. There should be one oxygen monitor for each six persons or each oxygen bottle, whichever is fewer.
   每 6 个人或每个氧气瓶应配有一名氧气观察员，以较少者为准。
3. Communications in the aircraft are extremely limited by the wearing of oxygen masks.
   戴上氧气面罩后，飞机上的沟通会受到极大限制。
   a. The spotter and oxygen monitor should establish with the jumpers and aircrew a standard set of hand signals for the commands, inquiries, and responses required during flight.
   进行看点定位的跳伞者和氧气观察员应与跳伞者和机组人员建立一套标准的、用于飞行过程中来代表口令、询问和回应的手势信号。
   b. A small blackboard or similar device may be helpful for communicating lengthier messages.
   一块小黑板或类似的设备可能有助于传达较长的信息。
4. Warning: Oxygen explosively accelerates burning.
   警告：氧气会爆炸性地助燃。
   a. 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.
   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，在电气方面应确保接地。
   b. No smoking should be permitted in the vicinity of the aircraft, either on the ground or aloft, while oxygen equipment is on board.
   飞机上有氧气装备时，内外或周边都不允许吸烟，无论在地面还是空中。
5. Ground practice「地面练习」
   a. Ground practice is essential because of—
   地面练习是必不可少的，原因如下—
      (1) restrictions on communication
      交流受限
      (2) the additional pre-exit activities required
      需要额外练习一些出舱前活动
      (3) restricted vision(by the mask)
      视野受限（因为戴上面罩）
      (4) restricted movement
      移动受限
         (i) results from bulkier clothing
         较厚的衣服造成移动不便
         (ii) is often further irritated by long periods of sitting and low cabin temperatures during the climb to jump altitude
         在乘飞机爬升的过程中，跳伞者长时间坐着，且舱内温度低，这往往会进一步影响身体移动。

b. Signals and exit procedures should be practiced on the ground in the actual jump aircraft until everyone can perform the procedures
交流信号和出舱程序应在地面上在拟使用的跳伞作业飞机上练习，直到每个人都能执行该程序
(1) by hand-signal command
通过手势信号指令
(2) smoothly and without discussion
能流畅地、在无需讨论的情况下执行程序

c. Practice will prevent confusion aloft that may result from inadequate rehearsal.
练习可以防止在高空由于排练不充分而导致混乱。

6. Equipment checks:「装备检查」

a. Equipment should be checked prior to loading the aircraft and especially before exit.
在登机前，尤其是在出舱前，应对装备进行检查。

b. In addition, the oxygen monitor should perform the "P.D. McCRIPE" oxygen equipment inspection:
此外，氧气观察员应执行以下的"P.D. McCRIPE"氧气装备检查：
Pressure gauge「压力表」
Diaphragm「隔膜」（*译者注：这里指氧气仪表上一个易发生破漏的部件*）
Mask「面罩」
Connections at mask「面罩的连接」
Connections at disconnect「机载气源断连处的连接」
Regulator「调节器」
Indicator「指示器」
Portable unit (walk-around bottle)「便携式装置（便携式氧气罐）」
Emergency cylinders (bailout bottles)「紧急气瓶（紧急供氧瓶）」

H. OXYGEN USE PROCEDURES「氧气使用的程序」

Oxygen use procedures will vary with the equipment used, but the following are basic.
氧气使用程序会随所用装备的不同而不同，但基本步骤描述如下。

1. Intermediate altitude:「中等海拔」

a. All participants should put on masks and begin breathing oxygen at 8,000 feet MSL.
所有参与者都应在 8000 英尺处戴上面罩，并开始吸氧。
(1) Breathing should be continuous throughout the remainder of the climb and jump run.
在剩余的飞机爬升过程中和跳伞航线上，应持续吸氧。
(2) This procedure should be conducted under the supervision of the oxygen monitor.
该程序应在氧气观察员的监督下进行。
(3) This procedure is important (even if it doesn't seem necessary), especially if more than one jump per day is planned.
该程序很重要（即使看起来没有必要），特别是如果计划每天跳超过一次此类型的跳伞的话。

b. Two minutes from exit—
出舱前两分钟—
(1) The spotter signals "get ready."
进行看点定位的跳伞者示意"准备好"
(2) At this time, all jumpers move into the ready position and prepare to remove their oxygen masks.
此时，所有跳伞者都进入准备位置，并准备好摘下氧气面罩。

c. prior to exit—
即将出舱前—

(1) Jumpers should stay on oxygen for as long as possible, removing their masks at the "climbout" or "exit" signal.
跳伞者应尽可能长时间地使用氧气面罩，只应在收到"爬出机舱"或"出舱"的信号时摘下面罩。

(2) The spotter need do nothing further than signal or lead the exit.
进行看点定位的跳伞者除了发出信号或引导出舱外，无需再做额外工作。

d. In the event of an aborted jump run, the oxygen masks should be redistributed and donned, a wide orbit made, and the process repeated, with all skydivers again breathing oxygen until within 30 seconds of exit.
如果中止某次跳伞航线的飞行，跳伞者应重新分配氧气面罩并戴上，飞机进行大半径盘旋，并重复上述的过程，所有跳伞者再次吸氧，直到出舱前 30 秒。
（译者注：飞机进行大半径盘旋的原因是跳伞者此前摘下氧气面罩，血氧饱和度已经下降，进行大半径盘旋可让跳伞者在再次准备出舱前有足够时间吸氧，恢复足够的血氧饱和度）

2. High altitude「高海拔」

a. All skydivers should pre-breathe 100% oxygen under the supervision of the oxygen monitor for 30 minutes prior to takeoff when goal altitude is above 25,000 feet MSL.
当目标海拔高度在 25000 英尺以上时，所有跳伞者应在起飞前在氧气观察员的监督下预先吸 30 分钟的100%纯氧。

b. When goal altitude is lower than 25,000 feet MSL, all skydivers should begin breathing from their on-board oxygen source at 8,000 feet MSL, under the supervision of the oxygen monitor.
当目标海拔高度在 25000 英尺以下时，所有跳伞者应在氧气观察员的监督下，从海拔 8000 英尺处开始使用机载氧气源吸氧。

c. Five minutes before exit, the spotter signals "get ready."
在出舱前 5 分钟，进行看点定位的跳伞者发出"准备好"的信号。

d. Two minutes from exit—
出舱前 2 分钟—

(1) The spotter signals two fingers and gives the command to activate bailout bottles, activates his own and, when he feels its pressure, disconnects from the aircraft oxygen system.
进行看点定位的跳伞者给出两个手指的手势信号，发出启动紧急供氧瓶的指令，然后启动自己的紧急供氧瓶，当他（她）感觉到供氧气压时，再与飞机的氧气系统断开。

(2) To prevent goggles from fogging, jumpers should leave their goggles raised until bailout bottle activation is completed.
为了防止护目镜起雾，跳伞者应将护目镜挂高，直到紧急供氧瓶启动完成。

e. Once on the bailout bottle, the spotter goes back to spotting.
一旦转为紧急供氧瓶供氧，进行看点定位的跳伞者应重新开始进行看点定位。

(1) The oxygen monitor gives the spotter the "thumbs up" signal when all other jumpers have functioning bailout bottles and are disconnected from the aircraft oxygen.
当所有其他的跳伞者都可正常使用紧急供氧瓶并与飞机的氧气源断开时，氧气观察员会向进行看点定位的跳伞者发出"竖起大拇指"的信号。

(2) The spotter then need only signal or lead the exit.
然后，进行看点定位的跳伞者只需要发出信号或引导出舱。

f. In the event of malfunction of the skydiver's first bailout bottle, there is sufficient time (two minutes) to switch to the backup bottle.
如果跳伞者的第一紧急供氧瓶发生故障，有足够的时间（两分钟）切换到备用瓶。

(1) In the event that no backup bottle is carried, the skydiver would be forced to remain connected to the aircraft oxygen system.
如果没有携带备用瓶，跳伞者将不得不保持与飞机氧气系统的连接。

(2) After the other jumpers exit, the jumper should descend to 20,000 feet MSL or lower, then jump or land with the aircraft.

在其他跳伞者出舱后，跳伞者应下降到海拔 20000 英尺或更低，然后才跳出飞机，或随飞机一起降落。

3. Extreme altitude: Standard procedures are not established, but must be developed for the specific mission and equipment.
极端高度：没有标准的程序，但必须为特定任务和装备制定程序。

I. SPOTTING PROCEDURES「看点定位的程序」

1. Direction of the wind at altitude and on the surface may not coincide.
高空的风向和地面的风向可能不一致。
   a. Winds aloft may also be stronger than surface winds (the jet stream is found at high altitude).
   高空风可能比地面风更强（高海拔处可能会有高速气流）。
   b. Adjust the exit point for freefall drift to allow for winds aloft.
   应考虑自由落体漂移来调整出舱点，以应对高空风。
   c. Exit point and opening point will not coincide.
   出舱点和开伞点会在不同地方。
2. The higher ground speeds attained by an aircraft indicating the same airspeed as usual at lower altitude radically increases the distance of forward throw that will be encountered on exit.
更高的飞机地速会大大增加出舱前抛距离，即使指示空速和低空飞行时差不多。
（*译者注：指示空速不是真空速，在相同的指示空速下，飞机在低空和高空的真空速是不同的，有兴趣的读者可自行查阅相关资料*）
3. To calculate the exit point, consult FAA Flight Service for the winds aloft up to the planned exit altitude.
为计算出舱点，请咨询联邦航空局航班服务部，以了解计划出舱高度处的高空风况。
   a. Using an average freefall rate of 10,000 feet per minute, compute the time required to freefall through each different layer of wind direction and speed reported.
   假设自由落体速率为平均每分钟 10000 英尺，计算自由落体通过风向和风速不同的各高度层所需的时间。
   b. Insert the time and wind speed figure into the following equation and solve for wind drift through each layer:
   将自由落体时间和风速数据代入以下方程，求解各高度层的风导致的漂移量：
   Drift = Wind Velocity × Time of Exposure
   高度层内漂移量=风速×在该高度层内的自由落体时间
      (1) The time component of wind speed and time of exposure must both be expressed in or converted to the same units, (i.e., feet per second and seconds, miles per hour and hours).
      “风速”和“自由落体时间”所采用的单位中的时间单位必须一致（即“英尺/秒”匹配“秒”，或“英里/小时”匹配“小时”）。
      (2) The drift distance will then be expressed in the same unit as the distance unit of the wind speed figure.
      这样，漂移量的单位将与“风速”数据中的长度单位保持一致。
4. Use a sheet of acetate, a grease pencil, and a map or aerial photo of the DZ and surrounding area to plot the exit point.
可使用一张薄纸、油性笔、一张跳伞基地降落区和周边区域的地图或航拍图来标记出舱点。
   a. On the acetate, mark a north-south reference line.
   在纸上标记一条南北方向参考线。
   b. Then beginning with the topmost wind layer and proceeding to the lowest layer:
   然后从最上层的高度层开始，一直计算到最下层的高度层：
      (1) In the same scale as the map or photo, plot the computed wind drift for each by a line.
      使用与地图或照片相同的比例尺，用直线画出高度层内的漂移计算结果。
      (2) Join the beginning of the line representing the drift anticipated in the next lower layer to the end of the line from the one above.
      较低一层高度层的预期漂移线的起点连接较高一层高度层的预期漂移线的终点。

c. The resulting zigzag line represents the total wind drift expected during freefall, without tracking.
最终结果是一条折线，这条折线表示在没有 Tracking 的情况下自由落体期间预期的总漂移量。

d. In the opposite direction of the exit altitude wind drift (or in the direction of the jump run if it is not to coincide with the wind direction) add 2,000 feet to compensate for forward throw from the aircraft.
在出舱高度处风向（或者如果跳伞航线的航向与风向不一致，则使用跳伞航线方向）的相反方向，应增加 2000 英尺的距离以补偿飞机的出舱前抛距离。

5. Throw wind-drift indicators at the planned opening altitude to determine the opening point, then, orient the acetate over the photo or map.
在计划开伞高度处投掷风飘指示器以确定开伞点，然后，在地图或航拍图上叠上刚才那张薄纸（南北方向应匹配）。

a. Place the end of the freefall wind drift line on the opening point indicated by the wind drift indicators.
将自由落体漂移线的终点放在根据风飘指示器测得的开伞点上。

b. The other end of the wind drift line now indicates the exit point.
自由落体漂移线的起点就是出舱点。

6. Jump run should be oriented directly into the wind at exit altitude to prevent lateral drift if spotting is to be primarily visual.
如果主要通过目视来进行看点定位，为防止横向漂移，应在出舱高度以正逆风方向飞跳伞航线。

7. Navigational aids may be used as the primary spotting reference, but the spot should always be confirmed visually prior to exit.
导航辅助设备可以作为主要的看点定位参考，但在出舱前必须通过目视确认点位。

J. HAZARDS OF OPENINGS AT HIGHER ALTITUDES「在高海拔高度开伞的危害」

1. As terminal velocity increases, so does the rate of change in speed from freefall to open canopy.
终端速度越高，自由落体速度与降落伞飞行速度的速度差越大。

a. At normal opening altitude, terminal velocity is about 160 feet per second(fps) and the rate of descent under open canopy is about 15 fps; thus, the change in velocity at opening is about 145 fps.
在正常开伞高度，终端速度约为 160 英尺/秒，开伞后的下降速度约为 15 英尺/秒，因此，速度变化量约为 145 英尺/秒。

b. By comparison, the figures for an opening at 40,000 feet MSL are 336 minus 40, or a 296 fps change in velocity in the same period of time.
相比之下，在海拔 40000 英尺处开伞时，这个数字是 336 减 40，即速度变化量为 296 英尺/秒。

c. At 60,000 feet MSL the change in velocity is even more striking: 543 minus 64, or 479 fps.
在海拔 60000 英尺处开伞的速度变化量更惊人，为 543 减 64，即 479 英尺/秒。

2. Because of the higher terminal velocity at the higher altitudes—
因为海拔越高，终端速度越高—

a. It is clear that an inadvertent opening can cause serious injury as result of the greater opening shock experienced.
显然，意外的过早开伞可能会产生更大的开伞冲击，导致严重受伤。

b. In addition, the equipment may not be able to withstand the load without damage.
此外，装备可能因无法承受过高的负载而损坏。

3. Even if a skydiver were not injured and the equipment not damaged, he or she would still face an extended period of exposure to the extreme cold at altitude.
即使跳伞者没受伤，装备也没损坏，他（她）仍将长时间暴露在高空的极寒中。

4. Another hazard of a canopy opening at higher altitude is hypoxia.
在高海拔高度开伞的另一个危险是缺氧。

<table>
<tr><th>Goal Altitude (MSL)
目标
海拔高度</th><th>Classification
高度的分类</th><th>License Recommended
建议执照等级</th><th colspan="7">Equipment Required[1]
所须装备[1]</th><th>Training Recommended[3]
建议的培训[3]</th></tr>
<tr><td>70,000</td><td rowspan="6">Extreme
极端海拔</td><td rowspan="6">USPA Class D
USPA D执照</td><td rowspan="3">Mask
氧气面罩</td><td colspan="3">Aircraft Onboard Oxygen Source
机载氧气源</td><td colspan="2">Bailout Oxygen Source
紧急氧气源</td><td>Pressure Suit
压力服</td><td rowspan="6"></td></tr>
<tr><td rowspan="2">60,000</td><td rowspan="2">Regulator
调节器</td><td colspan="2">Setting
设置</td><td rowspan="2">Freefall Descent
自由落体下落</td><td rowspan="2">Canopy Descent
降落伞下降</td><td rowspan="2">Full pressure required
压力服压力为全压</td></tr>
<tr><td>Auto
自动</td><td>Manual
手动</td></tr>
<tr><td>50,000</td><td colspan="7">Pressure suit helmet-integrated breathing apparatus required.
需要戴上压力服头盔一体化的呼吸器</td></tr>
<tr><td>45,000</td><td rowspan="3"></td><td rowspan="3"></td><td rowspan="3">Emergency
紧急情况</td><td>Above 45M
45M以上</td><td rowspan="3">Standard emergency “bailout bottle” assembly
标准“紧急供氧瓶”系统</td><td rowspan="3">No suitable “off the shelf” hardware available at this time
目前没有合适的“现成的”硬件可用</td><td rowspan="3">Partial pressure required
压力服压力可低于全压</td></tr>
<tr><td>45M</td></tr>
<tr><td>43,000</td><td>43M</td></tr>
<tr><td>40,000</td><td>41M</td><td></td><td></td><td></td></tr>
<tr><td>35,000</td><td rowspan="5">High
高海拔</td><td rowspan="5">USPA Class C
USPA C执照</td><td rowspan="2">Positive Pressure
正压</td><td rowspan="2">Pressure breathing
加压呼吸</td><td rowspan="2">100% Oxygen[2]
100%纯氧[2]</td><td rowspan="2">Safety
安全性</td><td rowspan="4">Average duration 10-12 mins
平均持续时间10-12分钟</td><td rowspan="4">Standard “bailout bottle”
标准“紧急供氧瓶”</td><td rowspan="4">None Required
不需要</td><td rowspan="4">Physiological flight training course and at least one jump from below 15,000 feet or below using full oxygen gear in freefall.
飞行生理培训课程，且至少在一次15000英尺或以下的自由落体跳伞中时使用过全套氧装备</td></tr>
<tr><td>33,000</td></tr>
<tr><td>30,000</td><td rowspan="3">Diluter demand
稀释模式需求模式</td><td rowspan="3">Diluter demand
稀释模式需求模式</td><td rowspan="3">On normal oxygen
用正常氧气</td><td rowspan="3">Normal oxygen
用正常氧气</td></tr>
<tr><td>25,000</td></tr>
<tr><td>20,000</td></tr>
<tr><td rowspan="2">15,000</td><td rowspan="2">Intermediate
中等海拔</td><td rowspan="2">USPA Class B with 100 jumps
USPA B执照且至少跳过100次伞</td><td>Constant flow
恒定流</td><td>Continuous flow
连续流</td><td>On
开启</td><td>On
开启</td><td>None Required
不需要</td><td>None Required
不需要</td><td>None Required
不需要</td><td rowspan="2">Physiological flight training course
飞行生理培训课程</td></tr>
<tr><td colspan="7">Use supplemental oxygen on board above 8,000 ft. MSL until exit.
飞机在海拔8000英尺以上时应使用补充氧气，直到出舱</td></tr>
<tr><td>10,000</td><td rowspan="3">Low
低海拔</td><td rowspan="3">None required
无执照要求</td><td colspan="7">Supplemental oxygen on board aircraft. Use above 10,000 ft. MSL, whenever elapsed time above 8,000 ft. MSL is expected to exceed 30 minutes.
飞机上应有补充氧气。如果在海拔8000英尺以上的飞行时间预计超过30分钟，应在海拔10000英寸以上使用补充氧气。</td><td rowspan="3"></td></tr>
<tr><td>8,000</td><td colspan="7"></td></tr>
<tr><td>Sea Level
海平面</td><td colspan="7"></td></tr>
</table>

1. Minimum equipment listed. Equipment shown for higher altitudes satisfies all requirements for lower altitudes.

   所列出的是最低的装备要求。更高高度的跳伞装备要求可满足较低高度跳伞的所有要求。

2. Oxygen systems for high-altitude flights and skydiving should be filled with aviator’s oxygen, not medical oxygen. Medical oxygen has a high moisture content which can cause oxygen mask valves to ice over in high-altitude operations.

   高海拔飞行和跳伞的氧气系统应使用航空用氧气，而不是医用氧气。医用氧气含水量高，在高海拔作业中可能会导致氧气面罩阀结冰。

3. Always rehearse oxygen, communication, and exit procedures before takeoff.

   起飞前一定要排练好供氧程序、沟通程序和出舱程序。

Classification 高度的分类	Average Freefall for 2,000 ft. AGL Opening (sec) 假设离地2000英尺开伞，则平均自由落体时间（秒）为	Time of Useful Consciousness Without Oxygen or Pressure (mm:ss) 没有氧气或加压的情况下，人能维持有用的知觉的时间	Aircraft Required 需使用的飞行器动力	Hypoxia Symptoms 缺氧症状	Special Consideration 特殊考虑因素
Extreme 极端海拔	Unknown 未知	00:09	Gas Balloon 气球		In this region, supersonic speeds may be attained during the freefall. The effects of transonic and supersonic freefall on sky divers and their equipment are not known at this time. 在该高度范围，自由落体过程中的跳伞者可能会达到超音速。跨声速和超音速自由落体对跳伞者及其装备的影响目前尚不清楚。 At 63,000 feet MSL, the critical pressure of your blood and body fluids is reached. Without pressurization, or in the event of a failure of pressurization at or above this altitude, your blood and body fluids will boil. 在海拔63000英尺，人的血液和体液会达到临界压力。如果没有加压，或者在这个高度或这个高度以上如果发生加压失败，人的血液和体液就会沸腾。 In the event of an inadvertent parachute deployment at high or extreme altitude, the parachutist (if conscious) should break away from that parachute and freefall to a lower altitude, if there is insufficient oxygen for a canopy descent to 15,000 feet MSL. 在高海拔或极端海拔意外开伞的情况下，如果没有足够的氧气来操作降落伞降到海拔15000英尺，则跳伞者（如果有知觉）应切伞，并自由落体到较低的高度。 The opening shock and malfunction probability of a deploying parachute increases radically with altitude. A final equipment check before leaving the aircraft will help prevent premature deployment. 开伞冲击力以及开伞过程发生故障的概率随高度的增加而急剧增加。出舱前的最后一次装备检查有助于防止过早意外开伞。
	190	00:20	Turbo Jet 涡喷发动机		
	178	01:00			
	160	01:30			
High 高海拔	140	02:30	Turboprop 涡桨发动机	• loss of: 失去： »consciousness[4] 知觉[4] » muscular control 肌肉控制 » judgment 判断力 » memory 记忆力 » reasoning 推理能力 » time sense 时间概念 • convulsions 抽搐 • repeated purposeless movements 重复无目的的动作 • emotional outbursts 情绪爆发	Above 25,000 feet MSL, the skydiver is subject to decompression sickness including the bends, chokes, and cramps, resulting from the nitrogen in the bloodstream coming out of solution and forming a froth of bubbles around joints. 在海拔25000英尺以上，跳伞者容易患上减压病，包括曲肢、窒息和痉挛，这是由于血液中的氮气逸出，在关节周围形成泡沫造成的。 Decompression sicknesses are avoided to a large extent by denitrogenization of the bloodstream by breathing 100% oxygen for at least one hour before reaching an altitude of 25,000 feet MSL. 在飞到海拔25000英尺之前，通过呼吸100%的纯氧对血液进行脱氮处理，可以在很大程度上避免减压病。 Air temperature above 20,000 feet MSL may be expected to be below zero, year-round. All skin should be protected from wind blast by clothing since exposed skin areas are subject to severe frostbite. 海拔20000英尺以上的空气温度预计全年都在零度以下。暴露在外的皮肤部位容易出现严重的冻伤，所以应穿上衣服来保护全部皮肤免于风刮。
			Turbocharged engine 涡轮增压发动机		
		05:00			
	120		Reciprocating engine 往复式发动机		
Intermediate 中等海拔				• false sense of wellbeing 舒适感错觉 • narrowing field of attention 注意力范围缩小 • blurring vision 视觉模糊 • overconfidence 过度自信 • poor memory 记忆力差 • faulty reasoning 错误推理 • fatigue 疲劳 • drowsiness 嗜睡 • poor judgment 判断力差 • headache 头痛 • sluggishness 呆滞 • deterioration of night vision 夜视能力下降	All airspace above 18,000 feet is designated as Class A airspace. Refer to FAR Part 105 for special rules governing the conduct of skydiving operations in this area. 所有18000英尺以上的空域被指定为A类空域。有关在该空域内进行跳伞活动的特殊规则，请参阅FAR 105。
Low 低海拔					

4. AADs are recommended as a backup system on all high-altitude jumps, due to the possibility of the skydiver being rendered unconscious by oxygen system failure.

所有高海拔跳伞都建议使用 AAD 作为备用系统，因为氧气系统故障可能会导致跳伞者失去知觉。

6-8 带相机跳伞的建议 Camera Flying Recommendations

A. INTRODUCTION「简介」

1. Skydiving provides a wealth of visual stimulation that can be readily captured through still and video photography.
   跳伞提供了丰富的视觉刺激盛宴，这些视觉盛宴可以便捷地通过摄影和摄像保留下来。
2. Smaller and lighter cameras have made it easier and less expensive to take cameras on a jump.
   更小、更轻的相机使得携带相机进行跳伞变得更容易、更便宜。
3. Jumpers need to exercise caution with respect to camera flying:
   跳伞者需要对携带相机跳伞保持谨慎：
   a. camera equipment and its interaction with the parachute system
      相机设备及其与降落伞系统的相互影响
   b. activities on the jump
      跳伞中的活动
   c. breakoff procedures
      分离程序
   d. special emergency procedures for camera flyers
      带相机跳伞的摄影者（*译者注：为表述便利，下文简称“摄影者”*）的特殊紧急程序
4. Once a camera flyer has become completely familiar with the equipment and procedures of the discipline, he or she will be able to experiment and perform creatively.
   一旦摄影者完全熟悉了跳伞摄影的设备和程序，他（她）将能够进行实验和创造性的跳伞。

B. BACKGROUND「背景」

1. In the early days:「早期」
   a. Early pioneer camera flyers had to solve the obvious problems presented by big, cumbersome camera equipment and parachutes.
      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。
   b. Only the most experienced jumpers and photographers would brave the activity of filming others.
      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。
2. More recently:「现在」
   a. Miniature digital still and video cameras appear to present less of a challenge, encouraging more jumpers to use cameras on their jumps.
      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。
   b. Skydivers have become less concerned about the skill of a camera flyer jumping with their group.
      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」

1. Recommendations for flying cameras should educate potential camera flyers and those making jumps with them.
   携带相机跳伞的相关建议是为了对潜在的摄影者和那些与摄影者一起跳伞的人进行教育。
2. Jumpers should realize that flying a camera is a serious decision and that it requires additional effort and attention on each jump.
   跳伞者应该意识到，携带相机跳伞是一件严肃的事，在每次跳伞中都需要额外的努力和注意。

D. EQUIPMENT「设备」

1. 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:

携带相机跳伞时，在使用任何新的或改装的装备前，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：

a. helmet「头盔」
b. parachute「降落伞」
c. deployment device modification「开伞装置的修改」
d. camera「相机」
e. camera mount「相机底座」
f. flash「闪光灯」
g. switch and mounting「相机的开关和安装」
h. camera suit「摄像服」
i. other「其他」
   (1) sky surf board or skis
   空中滑板
   (2) tubes or other freefall toys
   软管玩具或其他自由落体玩具
   (3) wingsuit
   翼装

2. Prior to filming other skydivers, each new or additional piece of equipment should be jumped until the camera flyer is completely familiar with it and has 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或额外安装的设备，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。
3. Camera equipment「摄影器材」
   a. Small cameras are not necessarily safer to jump than larger ones.
   小型相机并不一定比大型相机更安全。
   b. Regardless of location, any camera mount should be placed and rigged with respect to the deploying parachutes.
   无论相机位置在哪，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。
   c. All edges and potential snag areas should be covered, taped, or otherwise protected.
   所有边角和潜在的突出区域都应被盖住、用胶带粘住或以其他方式进行保护。
      (1) Necessary snag points on helmet-mounted cameras should at least face away from the deploying parachute.
      安装在头盔上的相机的不可避免的突出区域应该至少远离正在开伞的降落伞。
      (2) A pyramid shape of the entire camera mounting system may deflect lines better than an egg shape.
      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。
      (3) Deflectors can help protect areas that can't be otherwise modified to reduce problems.
      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。
      (4) All gaps between the helmet and equipment, including mounting plates, should be taped or filled (hot glue, etc.).
      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（例如用热胶等）。
      (5) Protrusions, such as camera sights, should be engineered to present the least potential for snags.
      镜头瞄准器等突出物的设计应最小化出现障碍的可能性。
      (6) Ground testing should include dragging a suspension line over the camera assembly to reveal snag points.
      地面测试的内容应包括在安装好的相机上拖拽伞绳，以检查是否有易发生伞绳勾缠的地方。
   d. Sharp edges and protrusions can injure other jumpers in the event of a collision or emergency aircraft landing.
   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。

e. Cameras mounted on a jumper's extremities need to be kept clear during deployment.
在开伞过程中，装在跳伞者四肢上的相机必须始终远离可能影响开伞的区域。

f. Camera operation devices (switches, cables) need to be simple and secure.
相机操作装置（相机开关、传输线）要简单、安全。

g. Each added piece of equipment needs to be analyzed for its potential interaction with the overall camera system and the parachute.
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

4. Helmets and camera mounts「头盔和相机底座」

a. All camera platforms, whether custom or off the shelf, should be evaluated for safety and suitability to the camera flyer's purpose.
所有相机平台，无论是定制的还是现成的，都应接受下列人员的评估，以确认其安全性，以及是否适合跳伞摄影的用途。

(1) by a rigger
由降落伞装备师评估

(2) by an experienced camera flyer
由有经验的摄影者评估

b. The helmet should provide full visibility for the camera flyer:
头盔应能给摄影者提供宽阔的视野：

(1) in freefall
在自由落体过程中

(2) under canopy
开伞后

(3) during emergency procedures
在执行紧急程序期间

c. Empty camera mounts should be covered and taped to prevent snags.
未安装相机的底座应被盖好并用胶带粘好，以防缠上降落伞。

5. Helmet releases
头盔释放装置

a. An emergency release is recommended for camera helmets in the event of an equipment entanglement.
建议在相机设备与降落伞发生缠绕的情况下，紧急释放摄像头盔。

b. Emergency helmet releases should be easy to operate with either hand.
紧急头盔释放装置应易于用任意一只手操作。

c. Using a reliable helmet closure or clasp that can also be used as an emergency release promotes familiarity with the system.
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，有助于提高对系统的熟悉程度。

6. Parachute「降落伞」

a. Camera flyers should use a reliable parachute that opens slowly and on heading.
摄影者应该使用开伞缓慢且开伞过程中航向稳定的可靠的降落伞。

b. The deployment system needs to be compatible with the camera suit, if used.
如果穿了摄像服，则开伞系统需要与摄像服兼容。

c. 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.
摄像服的翼和底部连接处必须避免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。

d. The pilot chute and bridle length must be sufficient to overcome the additional burble created by a camera suit, if worn.
引导伞和引导伞系带的长度必须足够长，以克服因摄像服（如果穿了）产生的额外的涡流。

e. If the camera flyer generally opens higher than the other jumpers, a slower descending canopy may help reduce traffic conflicts.
如果摄影者的开伞高度通常比其他跳伞者高，那么摄影者使用下降速度较慢的降落伞可有助于减少交通冲突。

f. The camera flyer should weigh the advantages against the disadvantages of a reserve static line in the event of a partial malfunction.
在降落伞发生部分故障时，摄影者应权衡使用 RSL 的利弊。

(1) Advantages: could assist after a low cutaway or when disoriented during cutaway procedures
优点：在低空切伞后或在切伞过程中失去判断力时，可提供辅助

(2) Disadvantages: could deploy the reserve during instability following a cutaway, increasing the chances for the reserve entangling with the camera system, especially a poorly designed one
缺点：在切伞不稳定的情况下开备伞，增加了备伞与相机系统缠绕的概率，特别是设计较差的相机系统

g. As always, proper attention to packing and maintenance, especially line stowage, helps prevent hard openings and malfunctions.
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。

7. Recommended accessory equipment
推荐的辅助设备

a. audible altimeter
声音高度表

b. visual altimeter that can be seen while photographing
在拍摄过程中可以看到读数的目视高度表

c. hook knife
伞刀

E. PROCEDURES「程序」

1. General「一般信息」

a. 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 and without stress.
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。

b. A camera flyer should possess freefall flying skills well above average and applicable to the planned jump.
摄影者应具备远高于平均水平的自由落体飞行技能，并且这些技能适用于计划进行的跳伞。

(1) belly-to-earth
腹飞

(2) freeflying (upright and head-down)
自由飞（站飞、倒飞姿态）

(3) canopy formation
降落伞编队

(4) multiple (for skysurfing, filming student training jumps, etc.)
其他多种跳伞（如空中滑板、拍摄学生跳伞等）

c. It is recommended that jumpers be licensed and have completed 200 jumps before jumping with a camera.
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。

d. The jumper should have made at least 50 recent jumps on the same parachute equipment to be used for camera flying,
摄影者在进行摄影跳伞前，应该用摄影跳伞中将使用的降落伞进行过至少 50 次跳伞。

e. The camera flyer should know the experience and skills of all the jumpers in the group.
摄影者应该知悉团体中所有跳伞者的经验和技能。

f. Deployment:「开伞」

(1) The deployment altitude should allow time to deal with the additional equipment and its associated problems.
开伞高度应允许足够时间处理额外的设备及其相关问题。

(2) The camera flyer must remain aware of other jumpers during deployment.
在开伞过程中，摄影者必须继续注意其他跳伞者。

g. Each camera flyer should conduct a complete camera and parachute equipment check before rigging up, before boarding the plane, and again prior to exit.
摄影者应在每次穿装备前、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。

h. Camera jumps should be approached procedurally, with the same routine followed on every jump.
摄影跳伞应该按程序进行，每次跳伞都遵循同样的程序。

i. The priorities on the jump should be the parachute equipment and procedures first, then the camera equipment and procedures.
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。

j. Introduce only one new variable (procedure or equipment) at a time.
一次最多只引入一个新变量（程序或设备）。

k. A camera jump requires additional planning and should never be considered just another skydive.
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。

2. Aircraft「飞机」

a. Cameras should be worn or secured during take off and landing to prevent them from becoming a projectile in the event of sudden movement.
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。

b. A camera flyer needs to be aware of the additional space the camera requires:
摄影者应知道相机占用了额外的空间：

(1) Use caution when the door is opening to prevent getting hit by door components.
飞机舱门打开时要小心，以防撞到舱门。

(2) Practice climbout procedures in each aircraft to prevent injury resulting from catching the camera on the door or other part of the aircraft.
在每架飞机上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。

(3) To prevent injury and damage to the aircraft, the camera flyer should coordinate with the pilot before attempting any new climbout position.
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。

3. Exit「出舱」

a. Unless the plan calls for the camera flyer to be part of the exit, he or she should remain clear of the group, being mindful of the airspace opposite the exiting jumpers' relative wind.
除非跳伞计划需要摄影者参与出舱流程，否则摄影者应远离出舱的团体，并注意出舱的跳伞者的相对风的反方向的空域。

b. A collision can be more serious with a jumper wearing a camera helmet.
戴着摄像头盔时发生的碰撞会导致更严重的后果。

c. Student jumpers can become disoriented if encountering a camera flyer unexpectedly.
跳伞学生如果意外遭遇摄影者，可能会失去判断力。

d. 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。

e. 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。

4. Freefall「自由落体」
   a. The jumpers should prepare a freefall plan with the camera flyer, to include:
      跳伞者应与摄影者一起制定自由落体计划，内容包括：
      (1) the camera flyer's position in relation to the group
          摄影者相对于团体的位置
      (2) any planned camera flyer interaction with the group
          任何计划进行的，摄影者与团体的互动
   b. The jumpers and the camera flyer should follow the plan.
      跳伞者和摄影者都应该遵照计划执行
5. Exit and breakoff「出舱和分离」
   a. All jumpers on the load should understand the camera flyer's breakoff and deployment plan.
      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。
   b. Two or more camera flyers must coordinate the breakoff and deployment more carefully than when only one camera flyer is involved.
      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。
   c. Filming other jumpers through deployment should be planned in consideration of the opening altitudes of all the jumpers involved and with their cooperation.
      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。
   d. The camera flyer should maintain awareness of his or her position over the ground and deploy high enough to reach a safe landing area.
      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。
6. Deployment「开伞」
   a. The camera flyer must exercise added caution during deployment:
      在开伞过程中，摄影者必须格外小心：
      (1) to prevent malfunctions
          防止发生故障
      (2) to assure an on-heading deployment and reduce the likelihood of line twist
          确保开伞时能保持朝向，并减少线缠绕的可能性
      (3) to avoid neck injury
          避免颈部受伤
   b. New camera flyers should consult with experienced camera flyers for specific techniques to prevent accidents during deployment and inflation.
      新手摄影者应咨询有经验的摄影者，以了解具体的技巧，防止在开伞和降落伞伞布充气过程中发生事故。
   c. Malfunction, serious injury, or death could occur if the lines of a deploying parachute become snagged on camera equipment.
      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。
7. Parachute emergencies「降落伞紧急情况」
   a. The additional equipment worn for filming can complicate emergency procedures.
      为拍摄而佩戴的额外设备可能会使紧急程序复杂化。
   b. Each camera flyer should regularly practice all parachute emergency procedures under canopy or in a training harness while fully rigged for a camera jump.
      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。
   c. Emergency procedure practice should include removing the helmet with either hand in response to certain malfunctions.
      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。

d. Routine emergency procedures should be practiced during every jump.
每次跳伞时都要进行常规的紧急程序练习。

e. When to release the helmet:
什么时候要释放头盔：

(1) equipment entanglements
与降落伞缠绕时

(2) obstacle landings(water, trees, building, power lines)
障碍物着陆时（水、树木、建筑物、高压线）

(3) whenever a dangerous situation presents itself
每当出现相关的危险情况时

F. CONSIDERATIONS FOR FILMING STUDENTS「拍摄学生跳伞的考虑事项」

1. Refer to the USPA Instructional Rating Manual for additional guidelines for flying camera for student training jumps.
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南。

a. A skydiver should have extensive camera flying experience with experienced jumpers prior to photographing or videoing student jumps.
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。

(1) At least 300 group freefall skydives
至少进行过 300 次团体自由落体跳伞

(2) At least 50 jumps flying camera with experienced jumper
至少与有经验的跳伞者进行过 50 次跳伞并摄像

b. The USPA Instructor supervising the jump should conduct a thorough briefing with the camera flyer prior to boarding.
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。

c. All procedures and the camera plan should be shared among the USPA Coach or Instructor, the camera flyer, and the student making the jump.
所有流程和拍摄计划应在 USPA 初级教练或 USPA 教练，摄影者，以及学生之间共享。

2. 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.
教练应该把全部注意力放在学生身上，学生无法考虑摄影者的动作和需求。

3. The camera flyer should avoid the area directly above or below a student or instructor(s).
摄影者应避开学生或教练的正上方或正下方的区域。因为：

a. Students may deploy without warning.
学生可能在无预警的情况下开伞。

b. Disturbing the student's or instructors' air could compromise their performance and the safety of the jumpers.
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。

4. Exit「出舱」

a. The camera flyer should plan an exit position that avoids contact with the student or the instructor(s).
摄影者应规划好出舱位置，避免与学生或教练接触。

b. During the exit, students often give erratic exit counts, making exit timing difficult for the camera flyer.
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。

(1) The camera flyer may leave slightly before the student exits if the count is reliable.
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。

(2) The camera flyer should follow slightly after the student's exit whenever the student's exit timing is uncertain.
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。

c. When filming tandem jumpers, the camera flyer must remain clear of the deploying drogue
当拍摄双人伞跳伞时，摄影者必须远离被释放的减速伞

5. The camera flyer needs to maintain independent altitude awareness and never rely on the student or instructor(s).
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。

6. Opening「开伞」
   a. The camera flyer is responsible for opening separation from the student and the instructor(s).
   摄影者负责在开伞前与学生和教练分开足够的距离。
   b. While dramatic, aggressive filming of openings compromises the safety of the student, the instructor(s), and the camera flyer.
   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。

7. 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.
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。

8. When using a handcam to film students, the tandem instructor should review the information contained in the tandem section of the Instructional Rating Manual Tandem Section 4-5 regarding handcam 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第 4 至 5 节—双人伞部分中有关手持式相机的培训信息。

6-9 首次翼装飞行课程（FFC）教学大纲

Wingsuit First Flight Course (FFC) Syllabus

Note: As used here, "Coach" describes an experienced wingsuiter. "Student" describes a first-time wingsuit jumper required to have a minimum of 200 jumps per BSR 2-1. It is also recommended that at least 200 jumps have been completed in the past 18 months before completing a wingsuit first jump course and making a wingsuit jump. Wingsuit manufacturers offer instructional ratings for their products. All jumpers, regardless of experience in other disciplines, are recommended to seek thorough training that covers all of the elements below.

注：本节所述的"翼装教练"指的是一位资深翼装跳伞者，"学生"指的是第一次进行翼装飞行的跳伞者，学生的跳伞次数应不低于 200 跳（参照本手册 2-1 节基本安全要求规定）。此外，在完成首次翼装飞行课程并进行翼装飞行之前，建议学生在过去 18 个月内至少进行过 200 次跳伞。翼装制造商会为其产品提供教学评级。建议所有学习翼装的跳伞者，无论是否有其他跳伞类型或科目的经验，都进行涵盖以下所有要素的全面培训。

A. CLASSROOM TOPICS「课堂主题」

1. Equipment Considerations「装备的考虑因素」
   a. Canopy selection「降落伞的选择」
      (1) Non-elliptical, docile main canopies with consistent opening characteristics, with a wing loading of not more than 1.3, and having a bridle length of at least six feet from pin to pilot chute are strongly recommended for First Flight Course (FFC) jumps.
      强烈建议在首次翼装飞行课程的跳伞中使用非椭圆伞型的、性能温和而易操控的、开伞的表现始终一致的、翼载不超过 1.3 的、从关包针到引导伞之间的引导伞系带长度至少为 6 英尺的主伞。
      (2) Students should be familiar with any canopy used on FFC jumps.
      学生应熟悉在首次翼装飞行课程的跳伞中使用的降落伞。
   b. Pilot Chutes and Deployment Systems「引导伞和开伞系统」
      (1) Wingsuits create a large burble above and to the back of a skydiver, and may not provide the pilot chute enough air for a clean inflation and extraction of the deployment bag from the pack tray.
      翼装会在跳伞者的上方和后部产生巨大的涡流，导致难以给引导伞带来足够的气流以让引导伞顺利充气并拉出 D 包。
      (2) Pilot chutes smaller than 24 inches are not recommended, due to wingsuiters' slower fall rates, which may result in reduced snatch force.
      不建议使用小于 24 英寸的引导伞，因为翼装飞行的下落速度较慢，这可能会导致引导伞的牵引力降低。
      (3) If wingsuiting becomes the student's primary skydiving activity, bridle length should be increased as the wingsuiter moves into larger suits that create larger burbles.
      如果翼装将成为学生的主要跳伞活动类型，则引导伞系带的长度应该增加，因为从小翼装过渡到大翼装后，翼装产生的涡流会更显著。
      (4) The bottom-of-container throw-out pilot chute is the only deployment system that should be used for wingsuit skydiving.
      翼装跳伞只能使用安装在伞包底部的抛出式引导伞作为开伞系统。
      (5) It is recommended that a pilot chute handle that is as light as possible be used on the main pilot chute.
      建议主伞引导伞上的把手的重量尽可能轻。
   c. Helmets and Automatic Activation Devices「头盔和 AAD」
      (1) Students should wear a helmet for FFC jumps.
      进行首次翼装飞行课程的跳伞时，学生应戴头盔。

(2) Use of an Automatic Activation Device is recommended for all wingsuit flights.
建议所有翼装飞行使用 AAD。

d. Audible Altimeters「声音高度表」

(1) Use of at least one audible altimeter is recommended for all FFC flights.
建议首次翼装飞行课程中进行的所有跳伞中，学生至少佩戴一个声音高度表。

(2) The first warning alarm should be set for 6,500 feet in preparation for wave-off and deployment.
第一个警报高度应设为 6500 英尺，以准备示意开伞和准备开伞。

(3) The second alarm should be set for 5,500 feet (deployment altitude).
第二个警报高度应设为 5500 英尺（开伞高度）。

(4) The third alarm should be set for 4,500 feet (low altitude warning).
第三个警报高度应设为 4500 英尺（高度过低警报）。

2. Wingsuit Selection「翼装的选择」

a. Wingsuit Designs「翼装的设计」

(1) Provide a general overview of the popular wingsuit models and advantages and disadvantages of different designs.
概览当前流行的翼装型号以及不同翼装设计的优缺点。

(2) Mono-wing and tri-wing designs;
单翼和三翼设计；

(3) Wing sizes and shapes, and their advantages and disadvantages for flocking, aerobatics, distance and slow flight.
翼装的尺寸和形状，以及其在翼装编队、特技飞行、长距离和低速飞行等方面的优缺点。

b. Discuss popular cutaway and emergency systems in general.
讨论常用的切翼和紧急系统。

c. Wingsuits for Use in FFC Jumps
用于首次翼装飞行课程的跳伞的翼装

(1) Wingsuit Coaches should select a wingsuit for FFC jumps that is appropriate for use by a novice wingsuiter according to manufacturer's guidelines.
翼装教练应根据制造商的指引，为首次翼装飞行课程的学生选择适合翼装新手的翼装。

(2) Wingsuit Coaches should explain why a particular suit has been selected and should ask the students questions to confirm that they understand these concerns.
翼装教练应该解释为什么选择某个特定的翼装，并问学生问题，以确认他们理解缘由。

(3) Students should be encouraged to continue to use suits appropriate for novice wingsuiters following completion of the FFC. In no event should students be encouraged in the FFC to use or purchase an expert or advanced suit.
应鼓励学生在完成首次翼装飞行课程的训练后继续使用适合新手的翼装。任何情况下都不应鼓励学生在首次翼装飞行课程的跳伞中使用或购买专家级或高级的翼装。

3. Wingsuit Attachment「翼装的附件」

a. The Coach must ensure that the student is fully capable of properly connecting the wingsuit to the parachute harness system used in a FFC, according to manufacturer guidelines.
翼装教练必须确保学生在首次翼装飞行课程中，能根据制造商指引，完全正确地将翼装连接到降落伞背带系统上。

b. Wingsuit Coaches should demonstrate to the student the proper method of attaching the wingsuit to the container.
翼装教练应向学生演示翼装与伞包进行附连的正确方法。

c. The student must receive training for attaching each specific type of wingsuit to the container prior to making any jump with that wingsuit.
在使用某特定的翼装进行任何跳伞之前，学生必须接受培训，学习如何将该特定类型的翼装附连在伞包上。

4. Wingsuit Pre-Jump Inspections「翼装的跳伞前检查」
   a. For a Cable Thread System, assure the cables are threaded correctly through the tabs, all the way up, with the wing cutaway handles properly secured.
      对于拉索连接系统，应确保拉索由下至上正确地穿过各个布环，切翼把手应稳妥固定好。
      （译者注：这里将用于断开翼面连接的把手称作“切翼把手”，有些切翼系统断开的是翼面与躯干的连接，有些则断开翼面与手臂的连接，取决于不同翼装的设计）
   b. For a Zipper Attachment System, look to see if the zipper is attached properly and completely. If applicable, check that the Velcro breakaway system isn't bunched or pinched
      对于拉链连接系统，应检查拉链是否适当且完全拉好。如果切翼系统使用了魔术贴，应确保魔术贴粘贴正确，无褶皱。
   c. Tug on the wing to make certain that it is properly attached.
      应用力拉扯一下翼面，看看连接是否正常。
      (1) Students must be capable of connecting the parachute harness system to the wingsuit and demonstrate a gear check prior to being allowed to make their first FFC jump.
      学生必须能够正确地将翼装和降落伞背带系统进行连接，并且在被允许进行首次翼装飞行之前，执行装备检查。
      (2) The Coach is responsible for checking the wingsuit and parachute harness system prior to the first flight to ensure they are properly connected and the student is wearing the harness correctly.
      翼装教练有责任在学生进行首次翼装跳伞之前检查翼装和降落伞背带系统，确保两者正确连接，且学生的穿戴方式正确。
5. Wingsuiting Special Concerns「翼装飞行的特别注意事项」
   a. Restrictions on Motion「对肢体活动的限制」
      (1) Arm movements are generally more restricted during a wingsuit skydive, although the amount of restriction is model-specific.
      在翼装跳伞过程中，手臂的运动通常受限，尽管受限程度是视不同型号的翼装而定的。
      (2) Some suits do allow for a full range of arm motion, although pressurized cells in the wingsuit may make full arm movement more difficult.
      一些翼装允许手臂全方位活动，尽管翼装的加压区域可能使手臂的全方位活动更加困难。
   b. Fall Rates「下落速度」
      (1) A typical belly-to-earth skydiver has a vertical (downward) descent speed of approximately 120 miles per hour and a horizontal (forward) speed of zero.
      典型的腹飞跳伞者的垂直下落速度约为每小时 120 英里，水平前进速度为零。
      (2) A typical wingsuit skydiver has a vertical (downward) descent speed of approximately 65 mph and horizontal (forward) speeds ranging between 40 to 90 mph.
      典型的翼装跳伞者的垂直下落速度约为每小时 65 英里，水平前进速度在每小时 40 至 90 英里之间。
      (3) The deployment of the parachute following a wingsuit skydive results in the canopy leaving the pack tray at approximately a 45-degree angle from the flight direction.
      翼装跳伞开伞时，降落伞大致以 45 度角（相对于飞行方向）飞离伞包。
   c. Importance of Navigation「导航的重要性」
      (1) Wingsuits are capable of traveling tremendous distances from standard exit altitudes when compared to traditional skydivers.
      与传统跳伞相比，翼装能够从常规出舱高度开始飞出很远的距离。
      (2) This means great care must be taken when planning exit points.
      这意味着规划出舱点时必须非常小心。
      (3) Winds aloft must be taken into account, as should the potential for other canopy and aircraft traffic.
      必须考虑高空风的影响，以及其他降落伞和飞机的交通情况。

(4) Wingsuit flight within 500 feet vertically or horizontally of any licensed skydiver under canopy requires prior planning and agreement between the canopy pilot and wingsuit pilot.
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 英尺范围内进行的翼装飞行，须要该进行降落伞飞行的跳伞者和进行翼装飞行的跳伞者事先计划并达成一致。

(5) The USPA Basic Safety Requirements prohibit wingsuit flight within 500 feet vertically or horizontally of any solo or tandem student under canopy.
USPA 基本安全要求禁止在任何常规跳伞学生（包括双人伞学生）的垂直或水平距离 500 英尺内进行翼装飞行。

d. Water Landings「水上降落」

(1) If the wingsuit flight occurs near a coastline or other large body of water, remain close enough to the shoreline to ensure each wingsuit flyer can make it to the designated landing area or another suitable landing area
如果在海岸线或其他大型水域附近进行翼装飞行，应始终靠近岸边，以确保每个翼装跳伞者都能到达指定的着陆区或其他合适的着陆区

(2) In case of a water landing, it is critical that the arm wings and leg wing and booties are released before landing in the water to allow the jumper as much freedom of movement as possible after entering the water.
万一在水上降落，在降落前必须解开臂翼、腿翼和翼靴，以便在入水后肢体能尽量自由活动.

6. Exits「出舱」

a. Exit Order「出舱顺序」

(1) The minimum exit altitude for a first flight should be 9,000 feet AGL.
首次翼装飞行的最低出舱高度应为离地高度 9000 英尺。

(2) Wingsuiters should be the last to exit the aircraft(i.e., after tandems).
翼装跳伞者应最后出舱（即在双人伞之后）。

b. Exit Position「出舱姿势」

(1) Regardless of the aircraft, Wingsuit Coaches should always choose an exit position for the student that allows the student to exit safely:
无论使用什么飞机，翼装教练都应该为学生选择一个能让学生安全出舱的出舱姿势：

(2) The exit should allow the student to exit the aircraft in a stable manner.
应能让学生以稳定的方式出舱。

(3) The student must be trained for an exit that allows for safely clearing the tail of the aircraft.
学员必须接受出舱训练，以能够安全地避开机尾。

(4) The student should maintain eye contact with the Coach.
学生应与翼装教练保持眼神交流。

(5) The Coach must maintain proximity to the student.
翼装教练不得拉开与学生的距离。

(6) The Coach must maintain stability and eye contact with the student
翼装教练必须保持稳定，并持续与学生进行眼神交流。

(7) The Coach must not create a distraction or collide with the student.
翼装教练不得让学生分心，或与学生发生碰撞。

c. Typical FFC Jump Exit:「典型的首次翼装飞行的出舱程序」

(1) Coach checks the spot with student.
翼装教练和学生一起看点定位。

(2) Coach signals for an engine cut (if applicable).
翼装教练向飞行员示意引擎断开油门（如适用）。

(3) Student takes position at Coach's direction.
学生在翼装教练的指导下就位。

(4) Student uses an exit technique that directs his or her face toward the propeller of the aircraft.
学生使用的出舱技巧应能够让其面朝飞机螺旋桨出舱。

(5) This method not only provides a clean exit for both skydivers, but also provides for a good angle for video of the student exit.
这种方法不仅让两名跳伞者安全出舱，而且为拍摄学生的出舱视频提供良好的角度。

(6) Exit procedures should be practiced on the ground several times at the mock-up until the student can physically and verbally demonstrate all points of the exit clearly and with confidence.
学生在应在地面模型上练习出舱程序，直至能够清楚自信地通过口头和实操的方式演示出舱要点。

d. Avoiding Tail Strikes「避免撞击机尾」

(1) Students should be informed of the danger of collision with the tail of the aircraft if they open their wings immediately upon exit.
学生应该被告知，如果在出舱时立即展开翼装，会有与机尾相撞的危险。

(2) Students should demonstrate a two-second delay between exit and opening of their wings.
学生们应在出舱后延迟两秒展开翼装。

(3) Instruct the student to open wings after clearing the tail of the aircraft.
指示学生在已避开机尾后再展开翼装。

7. Body Position for Flight「翼装飞行的身体姿势」

a. Demonstrate Basic Neutral Body Position
演示基本的中性身体姿势

(1) The Coach should demonstrate a basic neutral position for the suit that the student will be flying in the FFC jump.
翼装教练应向学生演示将在首次翼装飞行课程的跳伞中使用的翼装的基本中性姿势。

(2) Have the student practice in both horizontal and vertical positions.
然后让学生站着练习和趴着练习。

b. Demonstrate How to Accelerate.「演示如何加速」

(1) The Coach should demonstrate how to accelerate.
翼装教练应该演示如何加速。

(2) Have the student practice this position.
然后让学生练习这个姿势。

c. Demonstrate How to Decelerate「演示如何减速」

(1) The Coach should demonstrate how to decelerate.
翼装教练应该演示如何减速。

(2) Have the student practice this position.
然后让学生练习这个姿势。

d. Demonstrate How to Turn「演示如何转向」

(1) The Coach should demonstrate how to turn.
翼装教练应该演示如何转向。

(2) Have the student practice these motions.
然后让学生练习这些动作。

e. Flat Spins and Tumbling
旋转和翻滚

(1) Poorly aligned body position and overly aggressive turns can result in flat spins or tumbling.
身体姿势不平衡和急剧的转向会导致旋转或翻滚。

(2) Students should be instructed in how to best manage flat spins per manufacturer guidelines.
应参照制造商的指引，指导学生解决旋转的最佳方法。

(3) If the student's flat spin is uncontrolled after 10 seconds, or if the flat spin occurs below 6,000 feet AGL, the student should immediately deploy.

如果学生不受控制地发生旋转超过 10 秒，或在离地高度 6000 英尺以下发生旋转，学生应立即开伞。

(4) Have the student practice this process.
让学生练习解决方法。

f. Signals「手势信号」

(1) Present any hand signals that the Coach intends to use during the first flight.
翼装教练应演示其打算在学生进行首次翼装飞行时使用的任何手势信号。

(2) Quiz the student on these signals after presentation and periodically throughout the remainder of the FFC.
在向学生演示手势之后，测试学生是否记住了手势，并且在课程的剩余时间里，不时对学生进行手势测试。

8. Deployment Procedures「开伞程序」

a. At 5,500 feet AGL, the student should wave off and deploy by 5,000 feet. This altitude provides ample time to deal with any emergency procedures and provides ample time to unzip/release and stow any parts of the wingsuit that may require release.
在离地高度 5500 英尺时，学员应示意开伞并在 5000 英尺以上开伞。这个高度提供了足够的时间来处理任何紧急程序，并提供了足够的时间来拉开拉链或解开和收起任何可能需要解开的翼装部位。

(1) Wave off by clicking the heels together three times; this is mandatory on every skydive.
示意开伞是通过三次脚跟互碰来完成的；这是每次翼装跳伞必做的。

(2) Collapse all wings simultaneously while maintaining proper symmetrical body position.
在身体姿势保持适当的对称性的同时，收缩翼装的所有翼面。

(3) Pull at correct altitude.
在正确的高度开始开伞。

(4) Collapse both arm wings and grasp the pilot chute handle.
收缩两侧臂翼，并抓住引导伞把手。

(5) Throw the pilot chute: the left hand makes a simultaneous symmetrical “fake throw” as the right hand throws the actual pilot chute.
抛出引导伞：右手实际抛出引导伞的同时，左手对称地“假抛出”。

(6) Following release of the pilot chute, bring both hands forward symmetrically to the front of the harness.
释放引导伞后，双手对称地向前移动至背带前部。

(7) Keep tail wing closed until the canopy is fully deployed.
腿翼保持缩着，直到降落伞完全打开。

b. Wingsuit Coaches should stress the importance of maintaining body symmetry and closed wings throughout the deployment sequence to avoid difficulties with deployment (e.g., line twists due to asymmetry or a pilot chute caught in the leg wing burble).
翼装教练应强调在整个开伞过程中保持身体对称和缩起翼面的重要性，以避免在开伞时遇到困难（例如由于不对称而导致线缠绕，或引导伞滞留在腿翼的涡流中）。

9. Emergency Procedures「紧急程序」

a. Arm wings may restrict movement and prevent the jumper from grabbing risers until the wings are released
臂翼可能会限制肢体活动，并让跳伞者在解开臂翼之前难以抓住组提带

b. Leg wings also restrict movement, and the large wing surface can have an effect on which way a body moves following a cutaway if the wing is still inflated.
腿翼也会限制肢体活动，如果翼面仍然充气，大的翼面可能会在切伞后对身体的移动方式产生影响。

c. Any wingsuit, regardless of the model, should allow enough range of motion to pull the cut-away and reserve ripcord handles without having to disconnect the arm wings.
任何型号的翼装都应允许足够的肢体活动范围，以能在不必解开臂翼的情况下切伞并打开备伞。

d. In the event of a main canopy malfunction, immediately pull the cutaway handle followed by the reserve ripcord. Do not waste time by disconnecting the arm wings first.
如果主伞发生故障，立即拉动切伞把手，然后打开备伞。不要浪费时间先解开臂翼。

e. It may be necessary to release arm wings in order to reach as high as the risers in the event the main canopy opens with line twists and the jumper needs to reach the risers.
主伞打开后，如果发生线缠绕，可能必须解开臂翼，跳伞者才能够到组提带，以解开线缠绕。

10. Procedures After Normal Canopy Inflation「降落伞正常充气打开后的程序」

a. Clear airspace.「确保空域畅通」

b. Unzip arm wings first; remove thumb loops (if necessary); unzip leg zippers and remove booties.
先解开臂翼的拉链；移开拇指环（如有必要）；然后解开腿翼的拉链，脱掉翼靴。

c. Tuck away or snap up leg wing (the student must do this on the ground until it can be done without looking, so student can keep eyes on surrounding airspace under canopy).
收好腿翼或扣上用于收腿翼的扣子（学生必须在地面上练习这个动作，直到可以在不用看的情况下完成这个动作，这样学生可以在开伞后一直盯着周围空域）

d. If video of the first flight is being recorded, the videographer (or Coach, as applicable) should attempt to obtain footage of the complete deployment sequence.
如果有录制学生首次翼装飞行的视频，摄影者（或翼装教练，如适用）应尝试录下学生的完整开伞视频。

e. Post-deployment Awareness
开伞后的意识

(1) Wingsuit skydivers often share canopy airspace with tandems and jumpers still on student status (as well as other jumpers that may have deployed higher than 3,000 feet AGL).
翼装跳伞者经常和双人伞、常规跳伞学生（以及在 3000 英尺以上开伞的其他跳伞者）共用降落伞飞行的空域。

(2) As experienced skydivers, the FFC student should exercise care around these other canopies to avoid canopy collisions.
作为经验丰富的跳伞者，进行首次翼装飞行课程的跳伞的学生应该小心注意其他降落伞，避免碰撞。

11. Navigation and Descent Plans
导航和下降计划

a. Navigation「导航」

(1) Because wingsuiters can travel miles from exiting the aircraft to the point at which they deploy, navigation is a critically important skill.
因为翼装跳伞者从出舱到开伞可能会飞行数英里的距离，所以导航是一项至关重要的技能。

(2) Winds aloft should be determined prior to FFC jumps by consulting the pilot or winds aloft forecasts.
在进行首次翼装飞行课程的跳伞之前，应通过咨询飞行员或查看高空风预报来确定高空风况。

b. Wingsuits generally fly a standard flight pattern, which may vary with the drop zone and air traffic concerns.
翼装飞行通常采用标准飞行航线，但在不同的跳伞基地，或出于空中交通的考虑，翼装航线可能会有变化。

(1) In a typical "left-hand pattern," the wingsuiter exits the aircraft and immediately turns 90 degrees from the line of flight for 10 to 30 seconds. They make a second 90-degree turn back along the line of flight, with significant separation between the wingsuiter and any deploying canopies.
典型的"左手航线"：翼装跳伞者出舱后，立即相对飞机的飞行路线转 90 度飞行，并持续飞行 10 到 30 秒。然后再做一次 90 度转弯，平行于飞机的飞行路线反向飞行，这样，翼装跳伞者和任何其他正在开伞的降落伞之间能有显著的距离间隔。

(2) Wingsuit Coaches should plan the navigation for the jump using an aerial photograph of the drop zone and surrounding areas.
翼装教练应使用跳伞基地降落区和周边区域的航拍图来规划翼装航线。

(3) After outlining the desired pattern, the Coach should plan the skydive with the student.
在描绘出需要执行的航线后，翼装教练应与学生一起规划跳伞。

(4) The student should be able to plan a basic exit point, flight path, and deployment point that assures vertical and horizontal separation from other skydivers on the load.
学生应该能够规划基本的出舱点、飞行路线和开伞点，以确保在垂直和水平方向上与同架次的其他跳伞者分开足够距离。

(5) Wingsuiters often deploy at altitudes where large canopy traffic may be found (e.g. tandems and AFF students). The planned flight path must take this into account. Emphasis should be placed on deploying at a safe distance from tandems.
翼装跳伞者的开伞高度上通常可能有大量其他降落伞（例如双人伞和 AFF 学生）。计划飞行路线时必须考虑到这一点。应重点注意与双人伞保持安全距离。

(6) If multiple groups of wingsuiters are to exit on the same load, the groups should exit and fly in opposite patterns (e.g., the first wingsuit group to exit may fly a left-hand pattern, and the second group may fly a right- hand pattern).
如果有多组翼装跳伞团体在同一架次上，那么这些翼装团体出舱后应以相反的航线飞行（例如，第一组出舱的翼装团体可以飞左手航线，第二组飞右手航线）。

(7) There should be a minimum 10-second separation between wingsuit groups.
翼装团体的出舱间隔至少为 10 秒。

(8) Wingsuit Coaches should anticipate possible student out-landings and communicate a plan with the drop zone's management. Students should be encouraged to carry a cell phone with them on all wingsuit jumps.
翼装教练应该做好预期，学生可能在场外降落，并与跳伞基地管理层沟通计划。应鼓励学生每次翼装跳伞随身携带手机。

(9) If a student makes any gross navigation mistakes, the Coach should require another jump before signing off on the FFC.
如果学生犯了严重的航线错误，翼装教练应该在批准学生通过首次翼装飞行课程之前，让学生再跳一次。

12. Clouds and Visibility「云层和能见度」
    a. A hole in the clouds suitable for typical skydivers (see SIM Section 9, Part 105), may not be sufficient for wingsuit skydivers.
    可以进行常规跳伞的云层空洞（见本手册第 9 章，第 105 部分）可能不足以用于进行翼装跳伞。
    b. Wingsuit skydivers must meet the requirements of (it is recommended that they exceed the requirements of) FAR 105.17.
    翼装跳伞必须满足 FAR 105.17 的要求（建议天气条件优于这些规定）。
    c. Below 10,000 MSL:「低于海拔 10000 英尺」
        (1) Three mile flight visibility;
        飞行能见度 3 英里；
        (2) Not less than 500 feet below clouds;
        低于云层至少 500 英尺；
        (3) Not less than 1,000 feet above clouds; and
        高于云层至少 1000 英尺；以及
        (4) Not less than 2,000 feet horizontally from clouds.
        与云层的水平距离至少 2000 英尺。
    d. Above 10,000 MSL:「海拔 10000 英尺以上」
        (1) Five mile flight visibility;
        飞行能见度 5 英里；
        (2) Not less than 1,000 feet below clouds;
        低于云层至少 1000 英尺；

(3) Not less than 1,000 feet above clouds; and
高于云层至少 1000 英尺；以及

(4) Not less than one mile horizontally from clouds.
与云层的水平距离至少 1 英里。

e. Wingsuit Coaches should avoid taking students on first flights if weather conditions may present visual obstructions.
如果天气状况可能阻碍视野，翼装教练不应带学生进行飞行。

f. In the event of inadvertently entering a cloud, students must be trained to maintain a straight-line flight path and avoid making any radical turns while in the cloud.
如果无意中进入云层，必须训练学生保持直线飞行，避免在云层中突然转向。

13. Communication with Pilots and Other Skydivers
与飞行员以及其他跳伞者的沟通

a. Pilot Considerations「飞行员的考虑因素」

(1) Pilots should not be distracted during takeoff or jump run.
在飞机起飞时或飞机在跳伞航线上飞行时，不应让飞行员分心。

(2) Wingsuit Coaches should communicate with the pilot either on the ground, or between 4,000 and 10,000 feet AGL.
翼装教练应在地面，或者在离地 4000 至 10000 英尺之间的高度与飞行员沟通。

(3) Wingsuit Coaches should inform the pilot of intended flight direction, any special needs, the number of wingsuiters exiting, and of any wingsuit floating exits.
翼装教练应告知飞行员预定的飞行方向、任何特殊需要、出舱的翼装跳伞者的数量，以及任何翼装的扒舱外出舱。

b. Pilots「飞行员」

(1) Wingsuit skydivers often exit the aircraft following tandems, and are usually the last to exit the aircraft.
翼装跳伞者通常在双人伞出舱后再出舱，一般是最后出舱的人。

(2) Inform the pilot if wingsuiters will remain in the plane for a minute or more following the exit of the last of the “traditional” skydivers(especially when there are significant winds aloft)
在最后一名常规跳伞者出舱后（尤其是在高空风很强的情况下），应告知飞行员，翼装跳伞者是否会在飞机上停留一分钟或更长时间

(3) Inform the pilot in advance if wingsuiters need an extended jump run requiring the pilot to power up the aircraft again prior to the wingsuiters’ exit.
如果翼装跳伞者需要飞机延长在跳伞航线上的飞行时间，应提前通知飞行员，要求飞行员在翼装跳伞准备出舱前，再次加大油门让飞机加快飞行速度。

(4) A solid engine cut is necessary for wingsuiters to avoid colliding with the tail during the exit, particularly in low-tail aircraft.
为了避免翼装跳伞者在出舱时与机尾相撞，断开油门是必要的，尤其是在低尾翼飞机上。

c. Other Skydivers「其他跳伞者」

(1) Wingsuiters should be aware of the deployment altitudes and types of skydiving activities (e.g., tandem, FS, freeflying, etc.) that are being conducted on their loads.
翼装跳伞者应知悉同一架次上其他跳伞者的开伞高度和跳伞类型（如双人伞、团体编队、自由飞等）。

(2) Wingsuiters should be aware of any skydivers on the load intending to deploy above 6,000 feet.
翼装跳伞者应注意同一架次上是否有准备在 6000 英尺以上开伞的跳伞者。

14. Confirm the Student’s Understanding「确认学生理解教学内容」

a. Ask Questions「提问」

(1) Wingsuit Coaches should ask questions throughout the FFC to make sure that the student understands the material.
翼装教练应在整个首次翼装飞行课程期间进行提问，以确保学生理解教学内容。

(2) At the conclusion of the FFC, the Coach should encourage the student to ask questions.
在首次翼装飞行课程结束时，翼装教练应该鼓励学生提问。

(3) The Coach should repeat any material that appears to have been misunderstood or which requires additional explanation.
翼装教练应再次解释任何可能被学生误解了的内容，或重复需要额外讲解的内容。

b. Perform a walkthrough following the completion of the ground portion of the FFC, the Coach should walk the student through the complete FFC jump.
完成的首次翼装飞行课程的地面课后，应演练一遍流程，翼装教练应带领学生完整地过一遍首次翼装飞行课程的跳伞实操流程。

(1) The student should be able to verbally relate the flight plan without prompting or coaching.
学生应能口述飞行计划，而无需翼装教练的提示或指导。

(2) The Coach should confirm that the student knows any hand signals that the Coach intends to use, and that the student is aware Coach may guide student via flight pattern.
翼装教练应确认学生能看懂翼装教练打算使用的任何手势信号，并且知道翼装教练可能通过飞行航线来引导学生。

(3) The student should be able to complete all of the activities without prompting by the Coach.
学生应能在没有翼装教练提示的情况下完成所有的动作。

B. GEARING UP AND PRE-FLIGHT GEAR CHECKS「穿装备和飞行前装备检查」

1. Gear Checks「装备检查」

a. Three Gear Checks. Wingsuit Coaches should perform a complete gear check at least three times:
3 次装备检查：翼装教练应至少进行 3 次完整的装备检查：

(1) Before rigging up;「穿装备前」

(2) Before boarding; and「登机前」

(3) Before exit.「出舱前」

b. Checking the Rig「装备检查」

(1) Always check the wingsuit and rig in a logical order, such as top to bottom, back to front.
始终按有逻辑的顺序检查翼装和跳伞装备，例如从上到下、从后到前。

(2) Automatic activation device switched on.
AAD 打开。

(3) Closing loop tight for properly closed container
关包绳足够紧，降落伞关包正常

(4) Pilot chute handle easily reached
引导伞把手容易够到

(5) Flap closing order and bridle routing correct
关包盖片的顺序和引导伞系带的走线正确

(6) Slack above the curved pin
关包针上方的引导伞系带留有一定的松弛部分

(7) Pin fully seated
关包针完全插入

(8) Tight closing loop, with no more than 10-percent visible fraying
关包绳足够紧，可见磨损不超过 10%

(9) Pin secured to bridle with no more than 10-percent fraying
关包针与引导伞系带的连接稳固，磨损不超过 10%

(10) Collapsible pilot chute cocked
可缩引导伞已预位（kill line 已拉好）

(11) Pilot chute and bridle with no more than 10-percent damage at any wear point
引导伞、引导伞系带的任何磨损处的磨损程度不得超过 10%

(12) Main deployment handle in place
主伞开伞把手就位

(13) Canopy release system and RSL
降落伞释放系统和 RSL

(14) Cutaway handle
切伞把手

(15) Reserve ripcord handle
备伞把手

(16) Leg straps threaded properly
腿带走线正确

(17) Chest strap threaded properly through the friction adapter and excess stowed securely
胸带正确地穿过（借助摩擦力系牢的）调节扣，且富余的部分紧紧地收好

c. Checking the Wingsuit「翼装检查」

(1) All zippers intact
所有拉链完好无损

(2) No rips, tears or excess fabric that may cover handles
无裂痕、撕裂或可能遮挡降落伞操作把手的多余布料

(3) Handles not pulled into or covered by wingsuit
把手没有被拉进翼装里，或被翼装遮挡

(4) All cables neatly secured (if applicable)
所有的翼装拉索都应整齐有序且稳妥保护好（如适用）

d. Checking the Helmet「头盔检查」

(1) Adequate protection
可提供足够的保护

(2) Fit and adjustment
大小合适，调整到位

e. Audible – settings (for example):
声音高度表，设置的示例如下：

(1) 6,500 feet「6500 英尺」

(2) 5,500 feet「5500 英尺」

(3) 4,500 feet「4500 英尺」

f. Altimeter「（目视读数的）高度表」

(1) Readable by student「易于学生读数」

(2) Zeroed「零点调好」

g. Goggles「护目镜」

(1) Clear and clean「清晰和洁净」

(2) Tight「佩戴紧密」

2. Attaching the Wingsuit to the Parachute Harness System
将翼装连接到降落伞背带系统上

a. Student Responsibility「学生的责任」

(1) The student is responsible for attaching the wingsuit to the harness under the supervision of the Coach.
学生负责在翼装教练的监督下将翼装连到背带上。

(2) The student should be able to attach the wingsuit with minimal guidance from the Coach.
学生应能在尽量无需翼装教练指导的情况下连接翼装。

b. Coach Responsibility「翼装教练的责任」

(1) The Coach is responsible for inspecting the attached wingsuit/harness system once it has been attached by the student.
学生连好翼装/背带系统后，翼装教练负责检查系统。

(2) Any mis-attachments or errors should be pointed out to the student for correction by the student.
任何连接错误或问题都应该向学生指出并让学生改正。

(3) Consider delaying the FFC jump to focus on gear issues if the student appears to have difficulty with this subject.
如果学生在装备方面有困难，可以考虑推迟翼装跳伞，集中精力解决装备问题。

3. Putting on the Gear「穿装备」

a. Student Responsibility「学生的责任」

(1) The student is responsible for attaching and putting on the gear.
学生负责连接和穿上装备。

(2) The student should be able to put on the wingsuit and parachute harness system without input (but while under supervision) from the Coach.
学生应能在没有翼装教练指导的情况下（但必须在翼装教练的监督下）穿好翼装和降落伞背带系统。

b. Coach Responsibility「翼装教练的责任」

(1) The Coach is responsible for inspecting the gear once it has been put on by the student. The Coach should complete the second complete gear check at this point.
翼装教练负责在学生穿上装备后检查学生装备。到这一步，翼装教练应完成第二次完整的装备检查。

(2) Wingsuit Coaches should pay particular attention at this point to harness attachment systems (i.e., leg straps and chest straps):
此时，翼装教练应特别注意背带的连接（即腿带和胸带）：

(3) Wingsuit Coaches should instruct the student to feel his or her leg straps through the wingsuit fabric to make sure that they are on and tight.
翼装教练应该指导学生隔着翼装布料感受自己的腿带，以确保腿带是穿好且紧绷的。

(4) Wingsuit Coaches should have the student shrug and the student should feel tension from the leg straps if they are on properly.
翼装教练应该让学生耸耸肩，如果学生穿得正确，应能感觉到腿带的拉力。

(5) The Coach should visually affirm that the leg straps are properly tightened around both legs of the student.
翼装教练应目视确认学生双腿的腿带已正确收紧。

(6) Consider delaying the FFC jump to focus on gear issues if the student appears to have difficulty with this subject.
如果学生在穿装备方面遇到困难，可以考虑推迟翼装跳伞，集中精力解决穿装备的问题。

(7) Once the gear is on, the student should be instructed not to remove any gear without informing the Coach.
学生穿好装备后，翼装教练应指示学生不要在没有通知翼装教练的情况下脱下任何装备。

C. WALK-THROUGH; BOARDING; RIDE TO ALTITUDE「演练；登机；飞机爬升」

1. Full Walkthrough「完整的演练」

a. Complete a full, geared up walk through of the skydive, from climb out to deployment.
完成一次完整的、装备穿好的跳伞演练，涵盖从爬出机舱到开伞的过程。

b. Demonstrate several hand signals that may be used by the Coach to confirm that the student understands them.
翼装教练应演示几个可能会用到的手势信号，确认学生是否理解。

c. The student should be able to complete the walk-through with minimal input from the Coach.
学生应在尽量无需翼装教练指导的情况下完成演练。

2. Confirm Weather Conditions「确认天气条件」
   a. Confirm that the Coach has an up-to-date weather forecast.
   确认翼装教练有最新的天气预报信息。
   b. Confirm surface winds and winds aloft are appropriate for wingsuiting.
   确认地面风和高空风适合翼装跳伞。
   c. Confirm sufficient daylight is remaining.
   确认有足够的日照时间。
3. Boarding the Aircraft「登机」
   a. Student Equipment「学生的装备」
      (1) Monitor the student's equipment.
      翼装教练监视学生的装备。
      (2) Encourage wingsuit and gear awareness.
      鼓励学生保持翼装和装备的意识。
   b. Coach's Equipment「翼装教练的装备」
      (1) if other experienced wingsuiters are present, ask for a gear check from one of them.
      如果有其他有经验的翼装跳伞者在场，请他们中的一位检查自己的装备。
      (2) This demonstration highlights to the student that even experienced wingsuiters seek out gear checks.
      这会向学生强调，即使是有经验的翼装跳伞者也会寻求他人帮忙进行装备检查。
4. Pre-exit Gear Checks「出舱前的装备检查」
   a. Conduct a complete pre-exit equipment check with the student at 3,000 feet below exit altitude.
   在出舱高度以下 3000 英尺，与学生进行一次完整的出舱前装备检查。
   b. Have the student shrug and feel the leg straps to confirm that they are properly routed.
   让学生耸耸肩以感受腿带，确认其走线正确。
   c. Remind the student to be aware of his movement in the aircraft during climb out.
   提醒学生在爬出机舱的过程中注意机内移动动作。
5. Spotting「看点定位」
   a. Coach Responsibility「翼装教练的责任」
      (1) The Coach should ask the student to identify the proper spot for exit.
      翼装教练应让学生识别合适的出舱点。
      (2) The Coach is responsible for confirming the spot and should not allow the first flight to occur unless the spot is appropriate.
      翼装教练负责确认点位是合适的，而且除非学生确定的点位是合适的，否则不得让学生进行首飞。

D. WINGSUIT EXIT AND FLIGHT「翼装的出舱和飞行」

1. Spotting「看点定位」
   a. Proper spotting techniques will help to assure an on-field landing.
   正确的看点定位技巧有助于确保场内着陆。
   b. Flying a standard box pattern will help to avoid other skydiver traffic and will increase the likelihood of making it back to the drop zone.
   按标准的箱形航线飞行将有助于避开其他跳伞者，并能提高返回跳伞基地降落区着陆的可能性。
   c. The student should make a visual confirmation of the landing area as well as make a note of where other jumpers are relative to the drop zone.
   学生应目视确认着陆区域，并注意其他跳伞者相对于跳伞基地降落区的位置。
   d. The airspace also needs to be checked for aircraft or any other air traffic.
   还需要检查空域内是否有飞机或任何其他空中交通。

2. Climb Out and Exit「爬出机舱并出舱」
   a. Climb out or set up in door, breathe and prepare to exit as per Coach instruction.
      爬出机舱，或在舱门内准备就位，深呼吸，并按照翼装教练的指示准备出舱。
   b. The Coach should observe the exit to evaluate:
      翼装教练应观察学生的出舱，以评估：
      (1) the students' stability; and
          学生的稳定性；以及
      (2) that the student delayed opening their wings as instructed to avoid the horizontal stabilizer.
          学生能按照此前的指示，推迟展开翼装，以避开飞机的水平尾翼。
   c. The student should establish stability as soon as possible.
      学生应尽快稳定下来。
3. Practice Pulls/Touches and Circle of Awareness
   模拟开伞练习，以及高度意识
   a. After establishing stability, the student should complete three wave offs and practice pulls/touches as taught in the ground portion of the FFC.
      在建立稳定性后，学生应按照首次翼装飞行的地面课的教学，完成三次示意开伞的动作，以及三次模拟开伞练习。
   b. The student should demonstrate awareness by responding to hand signals from the Coach and by being aware of his altitude.
      学生应回应翼装教练的手势信号，并保持高度意识，以展现其态势感知的意识。
4. Navigation「导航」
   a. The student should fly a standard pattern with minimal input or prompting from the Coach.
      学生应尽量能够在无需翼装教练提示的情况下按标准航线飞行。
   b. The Coach should note any discrepancies between the student's actual flight path as compared to his planned flight path.
      翼装教练应注意学生的实际飞行路线与计划飞行路线之间的任何差异。
5. Formation Flights「编队飞行」
   a. Due to the significant forward speed generated by wingsuits, each wingsuit flyer should fly parallel flight paths with one another.
      由于翼装飞行的高速前进速度，每位翼装跳伞者的飞行路线都应该是相互平行的。
   b. Flying head-on toward another wingsuit flyer should never be attempted.
      决不要尝试迎面飞向另一个翼装跳伞者。
   c. Flying an intersecting flight at 90-degree angles should never be attempted.
      决不要尝试与其他翼装跳伞者进行 90 度角交叉飞行。
   d. Reducing any significant lateral distances should be accomplished by flying towards the other wingsuiter at a gradual angle of 30 degrees or less.
      如果与其他翼装跳伞者的横向距离很远，应该通过 30 度或更小的夹角逐渐向另一个翼装跳伞者靠近。
6. Deployment「开伞」
   a. The student will wave off at 5,500 feet AGL and deploy not lower than 5,000 feet AGL.
      学员将在离地 5500 英尺高度处示意开伞，开伞高度不低于离地高度 5000 英尺。
   b. If possible, the deployment sequence should be captured on video.
      如有可能，应拍下学生开伞的视频画面。

E. DEBRIEF「简报」

1. Verify that the student has landed and returned safely to the hangar.
   确认学生已安全着陆并返回机库。

2. Provide a post-flight debrief.
   做飞行后简报。
   a. Conduct a walk and talk, allowing the student to act out his or her perceptions of the jump first.
      边散步边谈话，首先让学生展示自己对这一跳的观点。
   b. Particular attention should be paid to whether the student was aware of any mistakes he made during the jump.
      应特别注意学生是否意识到其在跳伞过程中所犯的任何错误。
   c. Explain the jump from the Coach's viewpoint.
      从翼装教练的角度讲解这一跳。
      (1) Accentuate the positive.
          强调积极的一面
      (2) Discuss areas for improvement.
          讨论需要改进的地方。
      (3) Review the video, if available.
          回放视频（如有）。
   d. Provide any necessary corrective training.
      提供任何必要的纠正训练。
   e. Conduct or overview the training for the next jump.
      进行或概述下一跳的培训。
   f. Record the jump in the student's logbook.
      在学生的跳伞日志上记录这一跳。

6-10 降落伞控制基础 Canopy Flight Fundamentals

A. INTRODUCTION AND PURPOSE「简介和目的」

1. The same ram-air parachute technology that has led to soft openings and landings, flat glides, and small pack volume has opened the door for higher performance with increased wing loadings (the jumper's exit weight divided by the area of the parachute canopy, expressed in the U.S. in pounds per square foot).
冲压空气式降落伞技术在为我们带来柔和的开伞、着陆，平坦的滑翔轨迹，以及较小的叠伞体积的同时，也在大翼载的情况下打开了通向高性能的大门（翼载即跳伞者的出舱重量除以降落伞的面积，在美国，该数值以磅/平方英尺为单位）。
   a. Skilled and practiced jumpers who choose to fly this equipment aggressively may achieve desirable results, given the right training and the use of good judgment.
   在受到正确的训练和判断力良好的情况下，熟练且经验丰富的跳伞者可能能够以较激进的方式操作冲压空气式降落伞并飞出理想的效果。
   b. In the hands of untrained, uncurrent, unskilled, and unpracticed pilots, this equipment and these techniques pose a potential threat to the pilot and others sharing the airspace.
   未经训练、无技能、无经验的跳伞者如果用这些装备进行高性能飞行，会对其自身以及其他处于同一空域的人构成潜在威胁。
   c. The recommended training in USPA's Integrated Student Program given in preparation for the USPA A license is not adequate to prepare jumpers for advanced canopy flight.
   USPA 综合学生计划中所建议的针对 A 执照的培训不足以用来为高级伞控飞行做准备。
   d. Routine canopy descents and landings alone do not provide the kind of skills and experience necessary to safely perform advanced maneuvers under more highly loaded canopies.
   单靠常规的降落伞飞行和着陆，跳伞者难以获得使用高翼载的降落伞安全地进行高级机动所需的技能和经验。
2. Jumpers, particularly those new to the sport, need to understand the potential dangers of flying this kind of equipment in the skydiving flight environment.
跳伞者，尤其是那些刚接触这项运动的人，需要深刻理解使用冲压空气式降落伞飞行的潜在危险。
   a. The ram-air parachutes used in skydiving, even those considered moderately loaded, can cover a large amount of horizontal and vertical distance when handled aggressively during descent.
   在跳伞运动中使用的冲压空气式降落伞，即使只是在中等翼载下，如果操作激进，也会在水平方向上前进很长距离，同时损失大量高度。
   b. High-performance landings are a part of a demanding and unforgiving discipline requiring careful study, practice, and planning.
   高性能的着陆有很严格的要求且容错率很低，需要仔细的研究、练习和规划。
   c. The reference for what equipment and techniques might be considered conservative or aggressive varies according to a jumper's experience, canopy size and canopy design.
   使用某个装备、进行某个飞行操作是保守还是激进，是视情况而定的，与跳伞者的经验，降落伞的尺寸和设计都有关。
      (1) Skydivers who jump highly loaded canopies may have different goals than others they advise.
      使用高翼载降落伞的跳伞者可能与向他们咨询建议的跳伞者有不同的目标。
      (2) Most successful high-performance canopy pilots have practiced extensively with larger canopies before experimenting with higher wing loadings.
      大多数优秀的高性能伞使用者在尝试使用更高翼载的伞之前，已经使用较大的伞进行了充分的练习。
      (3) It is difficult for a jumper who is accustomed to more advanced equipment and techniques to remember the challenges facing less-experienced jumpers.
      习惯使用高级装备和飞行技术的跳伞者未必能记得经验较少的跳伞者会面临的挑战。

B. SCOPE OF PERFORMANCE「性能范围」

1. "Advanced" refers to practices that combine equipment and control techniques to increase descent and landing approach speeds.
   本文中所指的"高级"是指通过装备和操控技术两者的结合，以加快降落伞下降速率以及着陆进近速率的做法。
   a. A canopy designed for more performance may exhibit relatively docile characteristics with a light wing loading and when flown conservatively.
      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。
   b. A canopy designed for docile performance that is flown aggressively and jumped with a higher wing loading can exhibit high-performance characteristics.
      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，则可能表现出高性能特性。
2. The types of errors that novice canopy flyers make on docile canopies without getting hurt could have serious consequences when made on more advanced equipment.
   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。
3. Advanced equipment generally refers to canopies loaded as follows:
   "高级"的装备一般指翼载如下的降落伞：
   a. above 230 square feet, 1.1 pounds per square foot or higher
      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）
   b. from 190 to 229 square feet, 1.0 pounds per square foot or higher
      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
   c. from 150 to 189 square feet, .9 pounds per square foot or higher
      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
   d. 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
4. Canopy design can play a significant role in skewing these numbers one way or the other.
   只以这些数字作为判断标准可能是有误导性的，降落伞的设计也起到了很重要的作用。
   a. Some canopies are designed for flaring with less-than-expert technique.
      有些降落伞被设计成不需很专业的技术就可以很好地拉平。
   b. Some canopies are designed to perform better with higher wing loadings but require skillful handling.
      有些降落伞被设计成为在高翼载下会呈现高性能，但要求熟练的操作。
   c. Earlier canopy designs, particularly those using 0-3 cfm canopy fabric ("F-111"), can be more challenging to land, even with relatively light wing loadings.
      早期的降落伞设计，特别是那些使用透气性在 0 至 3 立方英尺/分钟的布料（F111）作为伞布材料的降落伞，即使在翼载相对较轻的情况下，着陆可能仍然具有挑战性。
5. Advanced technique generally refers to control manipulation to induce speeds greater than stabilized, hands-off, level flight (natural speed) during descent and on the final landing approach.
   "高级"的技术通常指在降落伞下降和最后着陆进近过程中，为使降落伞飞行速度大于稳定状态下无操作输入的水平飞行速度（降落伞的自然飞行速度）而进行的操作控制。
6. Canopy flight characteristics and control become more challenging as field elevation, temperature, and humidity increase.
   海拔、温度和湿度越高，降落伞的飞行特性和控制会越有挑战性。
7. These recommendations do not consider the specialized information and expertise required to safely fly canopies at wing loadings approaching 1.5 pounds per square foot and beyond or canopies approaching 120 square feet or smaller.
   这些建议不考虑翼载接近 1.5（磅/平方英尺）及以上，或者降落伞面积在 120 平方英尺左右及以下时安全控制降落伞所需的专业信息和专业知识。

8. Each progressive step in downsizing, technique, and canopy design should be a conscious decision, rather than considered a routine part of a skydiver's progression:
通向降伞、高级技术、高性能伞的过程中的每一步都应是深思熟虑的决定，而不是一个跳伞者进步过程中所必需的：
   a. Jumpers downsizing to get a smaller or lighter container should also be prepared to handle the added responsibility of jumping a higher-performance canopy.
   为用更小伞包而降伞的跳伞者应准备好承担使用更高性能的降落伞的额外责任。
   b. Jumpers at drop zones with a high-performance canopy culture need to understand that neglecting the individual training required to pursue that discipline safely can lead to serious consequences for themselves and for others.
   在氛围倾向于使用高性能伞的跳伞基地的跳伞者应明白，如果忽略安全进行相关科目跳伞所需的个人训练，可能会对自身和他人造成严重后果。
   c. Jumpers need to understand the design intents of the canopies they purchase to see whether those canopies match their overall expectations and goals.
   跳伞者需要知道他们所购买的降落伞的设计意图，确认这些降落伞是否符合他们的总体期望和目标。
   d. The decision to progress to advanced canopy skills and equipment should include others who can be affected, including jumpers in the air and landing area who could be affected by a canopy piloting error.
   决定是否使用高级降落伞技术和高级装备时，应考虑到其他可能受影响的人，包括在空中和着陆区可能因伞控失误而被影响的跳伞者。

C. PERFORMANCE PROGRESSION「技能提升」

1. Jumpers will advance at different rates.
不同跳伞者的技能提升速度是不同的。
2. The “Canopy” sections (B.) in each category of the USPA Integrated Student Program outline a series of exercises valuable for exploring the flight characteristics and performance envelope of any unfamiliar canopy.
USPA 综合学生计划的每个单元中的 B 节「伞控」概述了一系列有助于探究不熟悉的降落伞的飞行特性和性能的练习。
   a. The jumper should become familiar with a standard controllability check to determine a baseline for later comparison in the event of a minor malfunction (broken line, detached steering control, fabric damage, etc.).
   跳伞者应能够熟练进行标准的降落伞可控性检查，以确立比较基准，从而在遇到轻微故障（伞绳断裂、刹车棒脱开、伞布损坏等）时可以进行比较评估。
   b. A jumper should review the basics on each new canopy before proceeding with more advanced maneuvers; skipping the foundations of flight control will show up later with potentially serious consequences.
   跳伞者在使用新的降落伞进行更高级的伞控动作前，应先熟悉回顾基本的伞控操作；跳过基础伞控练习可能会在稍后导致严重后果。
3. Before attempting any advanced landing maneuvers, each jumper should be familiar with the following under his or her current canopy at altitudes above 2,500 feet AGL:
在尝试任何高级的着陆动作之前，跳伞者应在离地 2500 英尺以上高度熟悉当前使用的降落伞的下列情况：
   a. reverse toggle turns (90 degrees reversing abruptly to 180 degrees)
   使用刹车棒进行反向转弯（朝一个方向转 90 度然后突然反向转 180 度）
   b. canopy formation approaches and at least non-contact canopy formation flight
   接近降落伞编队，以及至少进行非接触的降落伞编队飞行
   c. back-riser turns and flaring「后组提带转向和拉平」
      (1) If, due to a control problem, a jumper has decided to land a canopy using back risers, the jumper should be familiar with the technique.
      如果由于出现控制问题，跳伞者决定使用后组提带控制降落伞着陆，则跳伞者应先熟悉后组提带着陆的技能。

(2) A jumper may decide after experimentation and practice that a canopy is not safe to land with back risers.
在测试后组提带操作之后，跳伞者可能发现降落伞的状况不足以用于安全着陆。

(3) A jumper should consider this decision before contemplating advanced maneuvers or wing loadings where dropping or breaking a control line on final approach becomes more significant.
在考虑是否进行高级动作或提高翼载（这种情况下，刹车被放开或刹车线断裂会对最后进近产生重大影响）之前，跳伞者应先将（2）所述情况考虑在内。

d. front-riser control, including single and double front riser maneuvers (all performed with toggles in hand)
前组提带控制，包括单侧前组提带操作和双前组提带操作（进行所有操作时，刹车棒都须保持在手中）

e. altitude loss in a variety of diving and turning maneuvers (check the altimeter at the beginning and end of a turn)
各种俯冲和转向动作中的高度的损失（在转向开始和结束时检查高度表）

f. aborting a turn and recovery to flare
中止转向，恢复并拉平

g. slow-flight gliding and maneuvering (braked turns)
低速滑翔和机动（带刹车转向）

h. braked approach and landing
带刹车进近和着陆

D. DOWNSIZING PROGRESSION「降伞进度」

1. Before moving to a smaller size, a jumper should be familiar and comfortable with the following landing maneuvers on his or her current canopy:
在降伞前，跳伞者应熟悉并能熟练使用当前降落伞进行下列着陆机动：

a. landing flare from full, natural-speed flight
从全速正常飞行开始拉平着陆

b. flaring for landing from slow (braked) flight
从慢速（带刹车）飞行开始拉平着陆

c. consistent soft, stand-up landings within 32 feet of a planned target in a variety of wind conditions, including downwind
在各种风向条件下，包括顺风条件下，在距计划着陆目标 32 英尺范围内，始终能够做到站立的软着陆

d. beginning to flare, turning to ten-degree bank, and returning to wings-level before landing
开始拉平，然后转弯使伞翼倾斜角达到 10 度，并在着陆前让伞翼恢复水平

2. Downsize increments on the same canopy design
在同一种设计的降落伞上进行降伞时，降落伞尺寸的减量如下：

a. above 230 square feet, 30 square feet
230 平方英尺以上：一次最多降 30 平方英尺

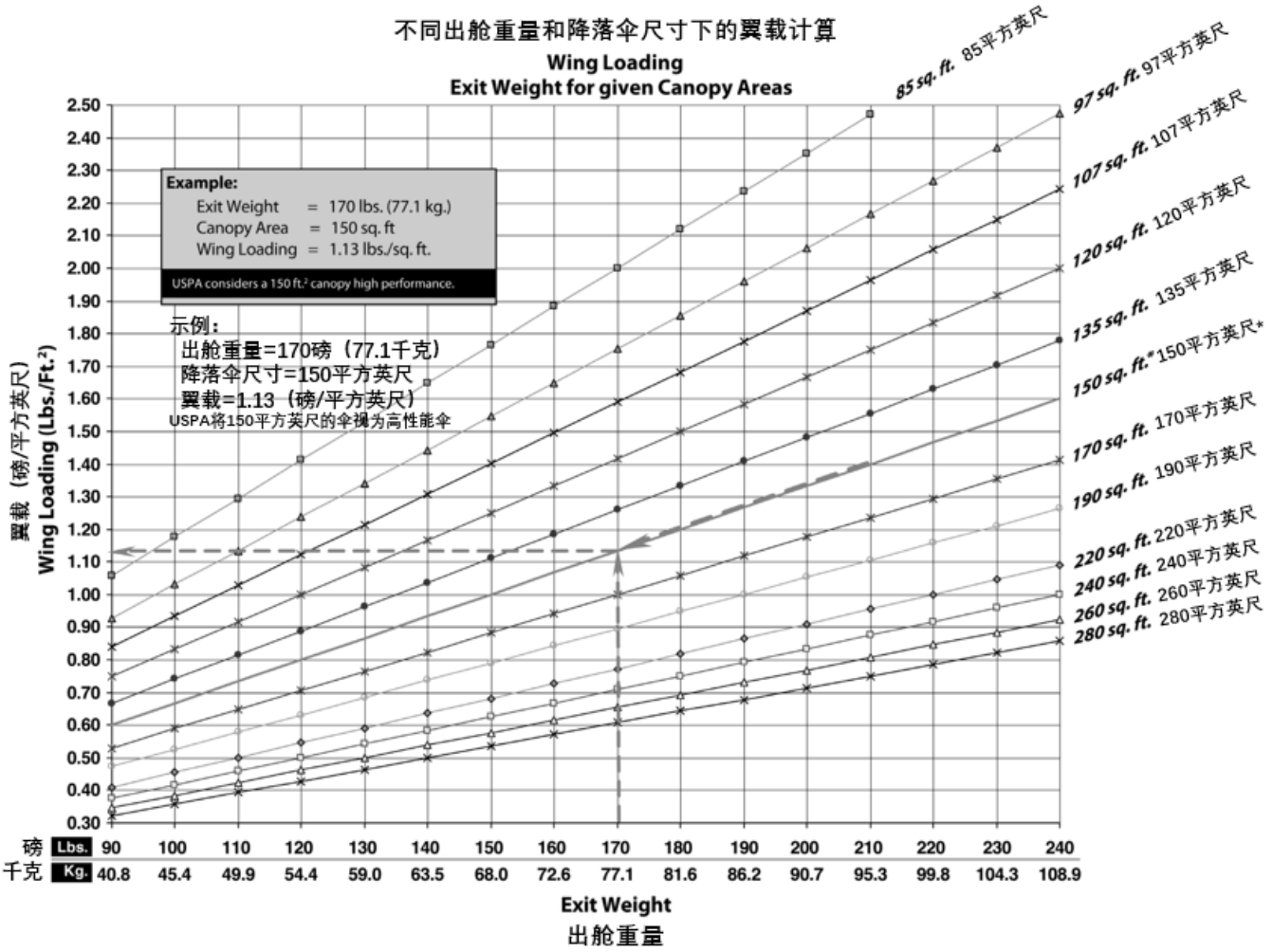
b. from 229 to 150 square feet, 20 square feet
从 229 到 150 平方英尺：一次最多降 20 平方英尺

c. from 149 to 120 square feet, 15 square feet
从 149 到 120 平方英尺：一次最多降 15 平方英尺

d. below 120 square feet in smaller increments
120 平方英尺以下：减量要更小

3. Before downsizing, jumpers should be familiar with any maneuver they plan to attempt or might encounter on a smaller canopy, including induced-speed landing approaches and braked landing approaches (low speed).
在降伞前，跳伞者应事先熟练掌握他们计划用较小降落伞尝试的动作或可能遇到的动作，包括诱导降落伞以高速着陆，或者带刹车着陆进近（低速）。

4. A jumper who has downsized without performing advanced maneuvers at each increment should practice them on a larger canopy first before trying them on his or her current canopy.
降伞后，未用过当前的较小降落伞做过高级动作的跳伞者，如果想用当前的降落伞做高级动作，应该事先用更大的降落伞练习，然后再用回当前的降落伞尝试。



E. DESIGN PROGRESSION「使用更高性能的降落伞设计」

1. Jumpers should explore only one new design element until completing and becoming comfortable with all recommended maneuvers.
跳伞者应该一次只接触和熟悉一种新的降落伞设计元素，直到完成并适应所有建议的动作。
2. Design increments (one design characteristic at a time at the same square footage before downsizing)
高性能设计元素的逐步纳入（降伞前，应在相同尺寸的降落伞下，一次只接触和熟悉一种新的设计特征）
   a. tapered or elliptical planform (degree of taper or ellipse varies according to design)
   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）
   b. cross-bracing or other airfoil flattening or stiffening design
   交叉支撑或其他展平或加强伞翼强度的设计
   c. modifications requiring additional in-flight procedures, for example, removable pilot chutes, deployment bags, and sliders
   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、滑块布。

F. PRACTICE AREA「练习区域」

1. To avoid danger to other jumpers, all practice of high-performance activities must take place in a landing area where other jumpers are not on approach.
   为避免对其他跳伞者造成危险，所有高性能伞控动作的练习必须在其他跳伞者未开始进近的着陆区域内进行。
   a. Separate by exit altitude.「通过出舱高度与其他跳伞者分开距离」
      (1) Canopy pilots exiting and opening high must consider other high-opening jumpers (students, tandems, and others) to avoid descending into their airspace during approach.
      高开的跳伞者必须考虑到其他在较高高度开伞的跳伞者（学生、双人伞等），以避免在进近时落入他们的空域。
      (2) Canopy pilots exiting on a lower pass must fly clear of the opening and canopy descent area before other jumpers exit higher.
      跳伞者在较低高度的出舱批次中出舱后，必须在其他跳伞者在较高高度出舱之前，飞向没有其他人开伞和下降的区域。
      (3) All jumpers should be aware of other canopies in their airspace, but it is especially critical that jumpers who choose to jump a high-performance parachute be aware of all canopy traffic that may be a factor during their descent and landing.
      所有跳伞者都应注意其空域内的其他降落伞，尤其重要的是，使用高性能伞的跳伞者应关注任何可能影响其降落伞下降和着陆过程的其他跳伞者。
   b. Separate by landing area.「通过着陆区域与其他跳伞者分开距离」
      (1) Landing areas must be separated according to wind direction so that no jumper is over the practice approach and landing area below 1,000 feet.
      着陆区域必须沿风向划分开来，以确保在 1000 英尺以下时，没有其他跳伞者在进近和着陆的练习区域内。
      (2) Canopy pilots descending into the practice landing area must be alert for errant jumpers.
      飞入练习着陆区的跳伞者必须警惕其他误闯入的跳伞者。
2. Advanced maneuvers, turns over 90 degrees, in a common landing area must never be attempted.
   在公共着陆区域不得进行高级动作以及超过 90 度的转向。
   a. It is a violation of the USPA Group Member pledge to allow high- performance landings to take place into common canopy traffic landing areas.
   允许高性能着陆发生在公共着陆区域是违背 USPA 团体会员（跳伞基地）承诺的。
   b. High-performance canopy landings with turns greater than 90-degrees must be separated by space by using a separate landing area, or by time, by providing a separate pass.
   着陆过程包含大于 90 度转向的高性能降落伞必须与其他降落伞分开。要么通过划分单独的着陆区域在空间上分开，要么通过安排单独的出舱批次在时间上分开。
   c. Whichever method is used to separate the canopy traffic, the high-performance landings must be separated from those who are flying a standard landing approach in such a way that the chances of a canopy collision are eliminated.
   无论使用哪种方法来拉开降落伞的间隔距离，进行高性能着陆的跳伞者都必须与进行标准着陆进近的跳伞者分开，这样才能完全消除降落伞碰撞的可能性。
3. Canopy pilots should be completely familiar with all advanced landing characteristics and techniques in a variety of weather conditions and using a variety of approaches before—
   在做以下所列的事情之前，跳伞者应完全熟悉各种天气条件下的所有高性能着陆特性和着陆技术，并进行过各种不同类型的进近
   a. attempting flight into a competition-style course.
   尝试飞竞赛航线。
   b. landing in the vicinity of any hazard, including water.
   在包括水域在内的任何危险区域的附近进行着陆

6-11 高级降落伞控制主题 Advanced Canopy Piloting Topics

OVERVIEW「概述」

A. INTRODUCTION「介绍」

1. USPA recognizes that effective advanced canopy pilot training beyond the required training for the first certificate of proficiency (skydiving license) can improve jumper skills and confidence and reduce the risk of canopy flight accidents.
   USPA 认识到，在获得首个跳伞熟练程度证书（跳伞执照）所需的培训之外进行有效的高级降落伞控制培训，可以提高跳伞的技能和信心，并降低事故风险。
2. USPA encourages the development of effective canopy piloting training courses.
   USPA 鼓励开发有效的降落伞控制培训课程。
3. The Advanced Canopy Piloting Topics outline provides canopy piloting instructors with a list of topics in a logical presentation order to advance the canopy flight knowledge and skills of licensed jumpers.
   本节大纲以逻辑顺序向伞控教练提供了一系列伞控主题，以提高持证跳伞者的伞控知识和技能。

B. BACKGROUND「背景」

1. Canopy design and flying techniques have advanced beyond what is expected of a USPA Instructor when preparing a skydiving student for the USPA A license.
   降落伞的设计和飞行技能知识已经超越了 USPA 教练帮助学生准备考取 USPA A 执照的要求。
2. Skydiving culture encourages skydivers to purchase and jump equipment that requires additional training to be jumped safely.
   跳伞圈的氛围可能会促使跳伞者购买需要额外训练才能用来安全跳伞的装备。
3. Analysis of accident reports indicates that jumpers are at risk without advanced canopy training beyond the A license.
   事故报告的分析表明，未接受过 A 执照以外的高级伞控训练的跳伞者会有更大风险。
   a. Jumpers who have progressed without advanced training to average designs at average wing loadings are largely unprepared for how their canopy will handle in difficult landing situations.
      没有经过高级伞控训练的，在平均翼载下使用平均性能设计的降落伞的跳伞者，对降落伞在困难着陆情形下的飞行表现缺乏准备。
   b. Jumpers who pursue induced-speed landing techniques without training put themselves and other jumpers at extreme risk.
      在没有经过训练的情况下，尝试诱导降落伞高速着陆的跳伞者会将自己和其他跳伞者置于极端的危险中。
4. Rather than limit jumper flying style and equipment choice, USPA has pursued an “education, not regulation” strategy in coordination with expert canopy pilots, advanced canopy training schools, and canopy manufacturers.
   USPA 不对跳伞者的飞行风格和装备的选择进行限制，而是与专业的伞控专家、高级伞控培训学校、降落伞制造商合作，推行“教育而非管制”的策略。
   a. basic but comprehensive canopy flight training and discovery in the USPA Integrated Student Program, leading to the A license
      USPA 综合学生计划中包含了基础但全面的伞控训练和探索，让学生能够获得 A 执照
   b. articles on basic and advanced canopy topics in Parachutist
      “跳伞者”（Parachutist）杂志上有基础和高级伞控专题的文章
   c. SIM Section 6-10, “Advanced Canopy Flight”
      SIM 6-10“高级伞控”相关内容
   d. this course outline for use preferably by USPA Instructors with additional qualifications as listed
      本课程大纲应由具备下文所列额外资格的 USPA 教练使用

C. SCOPE「范围」

1. To get the most from the topics presented in this outline, a jumper should have completed all the exercises listed under "Canopy" in SIM Section 4, Categories A-H of the ISP, and hold a USPA A license.
   为能高效学习本大纲所列伞控主题，阅读本节的跳伞者应已完成本手册第 4 章"综合学生计划"的 A 至 H 单元的「伞控」中列出的所有练习，并持有 USPA A 执照。
2. Jumpers who complete a course of instruction covering the topics listed here, including evaluations jumps and continued practice, should be better prepared to make choices regarding advanced equipment and maneuvers, as discussed in SIM Section 6-10.
   完成涵盖本节所列主题的伞控课程（包含评估跳和后续练习）的跳伞者应能更有准备地在高级装备、高级伞控动作（如 6-10 所讨论的）方面做出选择。
3. USPA encourages all jumpers to engage in a course of instruction with a qualified course director including these topics, particularly when preparing to jump advanced equipment or perform advanced maneuvers.
   USPA 鼓励所有跳伞者参加由合格的课程主管开办的涵盖本节所列伞控主题的教学课程，特别是在准备使用高级装备或执行高级伞控动作时。
4. The course conductor should organize the course to accommodate attendees according to their goals and objectives.
   课程组织者应根据参加课程的学生的目标和目的组织课程，以适应学生的需要。
   a. sufficient staff to assign to subgroups, according to performance or equipment objectives
      有足够的工作人员可以分组匹配不同水平和装备的学生
   b. separate courses on different dates and tailored for jumpers with like goals
      不同课程在不同的日期举行，为目标相似的跳伞者量身定制课程内容

D. INSTRUCTOR QUALIFICATIONS「伞控教练资格」

1. USPA does not issue instructional ratings specifically for canopy coaching.
   USPA 未专门针对伞控教学设置教学评级。
2. It is essential that the information contained in this course be presented correctly.
   本课程所包含的内容必须被正确地教授。
3. Those who intend to teach an advanced canopy piloting course should hold a USPA Instructor rating and have extensive knowledge of canopy flight.
   打算教授高级伞控课程的人员应持有 USPA 教练评级，并有全面的伞控知识。
   a. Instructors who intend to teach this material must realistically assess their level of knowledge regarding canopy flight and instruction.
      计划教授本节内容的教练必须实事求是地评估自身的伞控和教学的水平。
   b. Before teaching this course, instructors must work through the outlined canopy skills using a variety of canopy designs and wing loadings.
      在教授本课程之前，教练必须使用不同设计的降落伞和不同的翼载来练习大纲中所列的降落伞技能。
   c. Attending any one of several commercially available factory-sponsored canopy schools as a student is highly recommended before teaching this course.
      在教授本课程之前，强烈建议教练选择降落伞制造商赞助的多个伞控课程中的任意一个，并以学生的身份参加课程。
   d. For USPA B-license requirements, a S&TA must approve the course director and sign the Canopy Piloting Proficiency Card once the course is completed.
      对于 USPA B 执照的要求，安全和培训顾问必须对课程主管进行核准，并在课程结束后，在降落伞控制熟练程度卡上签名。

E. USPA B LICENSE REQUIREMENTS「USPA B 执照的要求」

1. Every USPA B license must also include a completed and signed copy of the Canopy Piloting Proficiency Card.

每个 USPA B 执照还必须包含一份填完和签好名的降落伞控制熟练程度卡的副本。

2. The completed Canopy Piloting Proficiency Card must be signed by a current USPA S&TA, Examiner, or USPA Board member.
   填好的降落伞控制熟练程度卡必须由任期内的 USPA 安全和培训顾问，考官，或者 USPA 董事会成员签名。
   a. The supervising official must ensure that a qualified course director conducts the training in this section.
      监督官员必须确保本节的培训是由合格的课程主管组织的。
   b. 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.
      在某些情况下，对本节内容进行教学的最佳人选可能不持有任何 USPA 评级，但却可能掌握大量关于伞控和着陆知识。
   c. These training jumps may be completed in a structured course with all five jumps completed in succession or the jumps may be completed individually.
      这些训练跳伞可在一个系统安排好的课程中完成，其中所有 5 次跳伞可以一次性连续跳完，也可以分开完成。
   d. The term course director applies to the person teaching this material, but is not an actual rating issued by USPA.
      “课程主管”一词指的是对本节内容进行教学的人员，但不是 USPA 实际发布评级。
   e. Each of the five training jumps listed on the USPA Canopy Piloting Proficiency card must be signed by a Verifying Official, who is responsible for supervision and training for the jump.
      USPA 降落伞控制熟练程度卡上所列的 5 次训练跳伞中的每一次都必须由一名负责监督和进行跳伞训练的核验人员签字。
   f. The final signature of the supervising official on the proficiency card is to verify that the training has been satisfactorily completed by the candidate.
      监督官员在熟练程度卡上进行最终签名，以确认学生已圆满完成培训。

F. EVALUATION「评估」

1. There is no “pass” or “fail” for a course of this nature, but attendees should be better able to self-assess their canopy aptitude and proficiency based on their own experience with the control maneuvers and an accurate evaluation of each approach and landing from a course director.
   这类课程本质上不存在“及格”或“不及格”的评分，但学生应能更好地根据自己的降落伞操作经验以及课程主管对每次进近和着陆的准确评估，来对自身的伞控能力和熟练程度进行评估。
2. The course director should sign and date the entries on the Canopy Piloting Proficiency Card as jumpers complete the items listed.
   当跳伞者完成所列项目时，课程主管应在降落伞控制熟练程度卡上签名并注明日期。
   a. control maneuvers「控制机动」
   b. loss of altitude in turns「转弯的高度损失」
   c. landing pattern「着陆航线」
   d. varied approaches「多种进近方式」
   e. approach and landing accuracy objectives「进近和着陆精度目标」
   f. aborted approach「中止进近」
   g. carving landings「Carving 着陆」
      （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）
3. The Canopy Piloting Proficiency Card can assist drop zone management in assessing a jumper's canopy skills.
   降落伞控制熟练程度卡可以帮助跳伞基地管理人员评估跳伞者的降落伞技能。
4. Each jumper should begin a new Canopy Piloting Proficiency Card for every new model and size canopy.

每用一个新型号和尺寸的降落伞，跳伞者都应使用新的降落伞控制熟练程度卡。

G. RISK ASSUMPTION「风险假设」

1. USPA warns all jumpers that skydiving comes with inherent and sometimes unforeseen hazards and risks that may or may not be preventable.
   USPA 警示所有跳伞者，跳伞伴随着固有的，有时不可预见的危险和风险，这些危险和风险可能可以预防，也可能无法预防。
2. While the goal of any skydiving training is to reduce risk, neither USPA nor the course director can predict the outcome or success of the training.
   虽然任何跳伞训练的目的都是为了降低风险，但无论是 USPA 还是课程主管都无法预测训练的结果或成功与否。
3. USPA warns all jumpers that 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.
   USPA 警示所有跳伞者，比起常规的降落伞着陆（以降落伞的自然速度直线进近直到拉平），为提高对伞控的理解所进行的一些机动涉及更大的受伤风险，甚至重伤或死亡。
4. A canopy pilot should receive as much coaching as possible to reduce the risks under canopy; however, USPA warns all jumpers that any pilot who manipulates the canopy controls to induce additional speed prior to landings presents a greater hazard to himself or herself and others.
   跳伞者应接受尽可能多的指导，以减少降落伞飞行的风险；然而，USPA 警示所有跳伞者，任何在降落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。
5. Before jumping begins, USPA advises the course director to 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.
   在跳伞开始之前，USPA 建议课程主管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。
6. USPA accepts no liability for the use of this outline and does not authorize its use in any course of instruction; ideas presented here come with no implied or expressed suitability for any purpose or application.
   USPA 对本大纲的使用不承担任何责任，也不授权在任何教学课程中使用本大纲；本节提出的想法不被暗示或明示适用于任何目的或应用。

GROUND SCHOOL TOPICS「地面课主题」

PART 1: EQUIPMENT「第 1 部分：装备」

A. EQUIPMENT CHOICE CONSIDERATIONS「选择装备的注意事项」

1. Because of certain advantages smaller canopies offer, a misconception pervades the sport that all jumpers are better off overall using a smaller canopy.
   由于小尺寸降落伞的某些优点，跳伞运动中普遍存在一种误解，认为用小尺寸降落伞会更好。
   a. Smaller canopies make for more compact and comfortable parachute systems.
      小尺寸降落伞使降落伞系统更加紧凑和舒适。
   b. Smaller canopies, especially the newer designs, can be easier to land than larger wings in ideal conditions.
      在理想条件下，小尺寸降落伞，特别是采用新型设计的降落伞，比大尺寸降落伞更容易着陆。
   c. Properly flown, smaller canopies provide greater versatility in higher winds.
      在适当的控制下，小尺寸降落伞在大风中有更高的灵活性。
2. Studies of USPA serious injury and fatality summaries reveal a trend where 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了一种趋势，即在使用普遍认为的"平均尺寸"或"保守翼载"

的降落伞的情况下，在非常规着陆情况中跳伞者经常会出现失误。

3. Jumpers should seek out reliable information before changing to smaller canopies.
跳伞者在转换到小尺寸降落伞之前应该寻找可靠的信息。
4. 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：
   a. classic accuracy「经典的着陆精准度跳伞」
   b. canopy formation「降落伞编队」
   c. competition freefall formation skydiving「自由落体团体编队跳伞比赛」
   d. large freefall formations「大型自由落体团体编队」
   e. wingsuits「翼装」
   f. camera flying「跳伞摄影」
   g. high-performance landings「高性能着陆」
   h. competition swooping「拉飘比赛」
5. All jumpers should
所有跳伞者都应该
   a. set goals in the sport
   设定跳伞运动的目标
   b. choose the best equipment to meet their needs
   选择最能满足需要的准备
   c. learn how to use that equipment
   学习如何使用这些设备
   d. skydive within the limits of their equipment and capabilities
   在装备的限制范围和自身能力范围内跳伞

B. WING LOADING「翼载」

1. Size v. wing loading「降落伞的尺寸和翼载」
   a. The shorter lines of a smaller canopy will cause it to respond differently than a larger one of the same design with an 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
   b. Compared to a canopy with longer lines, a shorter-lined canopy will have—
   与伞绳较长的降落伞相比，伞绳较短的降落伞会—
      (1) quicker turns「转向更快」
      (2) quicker flare response「拉平的响应更快」
      (3) quicker pendulum action(quicker to dive after an early flare)
      「伞会更快地把人甩起来（在较早的拉平（拉高）后更快地俯冲）」
   c. A canopy with a shorter chord (front-to-back measurement) responds more quickly to flare input.
   翼弦（前缘至后缘）较短的降落伞对拉平操作的响应更快。
   d. A canopy with a shorter span (wingtip-to-wingtip measurement) will respond more quickly to turn input.
   具有较短翼展（翼尖到翼尖）的降落伞对转向操作的响应更快。
2. In theory, glide angle doesn't change with wing loading.
理论上，滑翔角不随翼载的变化而变化。
3. Most jumpers can get a lot more performance from their canopies without needing to 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。

C. PERFORMANCE ENHANCING DESIGNS「提升性能的降落伞设计」

1. Tapered shape(planform)
两端渐缩的形状（翼面形状）

a. more dimensional stability(less distortion)
结构更稳定（伞翼变形更小）
b. faster forward speed from lower and cleaner drag
较低的流畅的阻力使伞的前进速度更快
c. faster turns and less flight stability
更快的转向和较低的飞行稳定性

2. High-aspect ratio「高展弦比」
   a. flat glide「平坦的滑翔航迹」
   b. easier flare「更容易拉平」
      (1) lighter toggle pressure
      拉平所用的刹车棒拉力更轻
      (2) shorter toggle stroke(some models)
      拉平所需的刹车棒行程更短（某些型号）
      (3) quicker flare response
      更快的拉平响应
3. 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
   a. seven-cell v. nine-cell「七孔伞和九孔伞的对比」
   b. cross bracing「交叉支撑」
4. Thickness(after inflation)
   伞的厚度（充气后）
   a. thicker: slow speed, more predictable and gentle stall
   厚伞：速度较慢，失速更容易预测且更温和
   b. 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

D. DRAG REDUCTION「减阻设计」

1. Zero-P fabric「ZP 伞布布料」
2. Small-diameter lines「直径较小的伞绳」
3. Collapsible pilot chute「可缩引导伞」
4. Collapsible slider:「可折叠滑块布」
   a. 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，现在的可折叠滑块布已无此类连接器*）
   b. larger v. smaller slider grommets
   较大的和较小的滑块布孔环的对比
5. Risers「组提带」
6. Outerwear「外套」
7. Removable Deployment Systems「可拆下的开伞系统（即 RDS）」
8. Body Position「身体姿势」

E. CONTROLS: TOGGLES AND BEYOND「降落伞的控制：刹车棒以及更多方式」

1. Brakes「刹车」
   a. toggle types for ease of handling
   便于手握的刹车棒类型
   b. steering line length to allow front riser maneuvers(toggles in hand)
   刹车线长度足够，以便进行前组提带机动（刹车棒保持在手中）
2. 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

3. Back risers and how they work
   后组提带及其工作原理
4. Front risers and how they work
   前组提带及其工作原理
5. Harness turns
   背带转向

F. ACCESSORIES「附件」

1. Jumpsuit(reinforced butt and knees)
   连体服（跳伞服）（臀部和膝盖部分加强）
2. Hard helmet「坚固的头盔」
3. Gloves, pros and cons「手套，有利有弊」
4. Altimeter「高度表」
   a. altimeter use under canopy
      开伞后高度表的使用
   b. digital v. analog
      电子高度表（电子信号）和机械高度表（模拟信号）的对比
5. Weights「配重」

G. SPEED「速度」

1. 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。
2. 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。

H. GLIDE「滑翔」

1. Skydiving canopies: approximately 2.5:1 in natural flight
   跳伞用的降落伞：正常自然飞行时滑翔比约为 2.5：1
2. Changing the glide「改变滑翔航迹」
   a. using brakes or rear risers
      使用刹车或后组提带
   b. 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 2 部分：降落伞的维护」

A. ENVIRONMENT「环境」

1. Dirt degrades of the fabric, lines, and slider
   污垢会使布料、伞绳和滑块布降解
2. Ultraviolet degrades nylon.
   紫外线会使尼龙材料降解。
   a. sunlight「阳光」
   b. fluorescent lighting(50% of the strength of sunlight)「荧光灯（日光强度的 50%）」
3. Water distorts reinforcement tapes
   水会使加固带变形

B. COLLAPSIBLE PILOT CHUTE AND SLIDER「可缩引导伞和可折叠滑块布」

1. 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。
2. Pilot chute centerlines shrink with use.
   引导伞中线（Kill Line）会随着使用而收缩。

C. SUSPENSION LINES「伞绳悬挂线」

1. Spectra can't stretch and shrinks a lot with use.
   Spectra 材质的伞绳难以拉伸，且随着使用易发生明显收缩。
2. Vectran is stable in both directions but abrades.
   Vectran 材质的伞绳在两个方向上都很稳定，但是易磨损。
3. HMA is stable but breaks 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。
4. Dacron stretches on opening, is stable and durable, but fat.
   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」

1. wear「磨损」
2. shrinkage「收缩」
3. the results of a broken line「刹车线断线的后果」
   a. upon flaring
      在拉平时
   b. 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 FOR AN ON-HEADING OPENING「良好的叠伞，以使开伞过程中朝向保持不变」

1. Even risers「整齐对称的组提带」
2. Symmetrical bag「对称放置的 D 包」
3. Line-stow placement and tension「伞绳的妥善绑紧和放置」
4. 24 inches of unstowed line「留出 24 英寸的伞绳余量不绑」

F. EQUIPMENT INSPECTION「装备检查」

1. Pre-jump「跳伞前」
2. 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: BREAK-OFF, OPENING, SEPARATION, AND CANOPY TRAFFIC「分离、开伞、分开间隔、降落伞交通」

A. BREAKOFF「分离」

1. 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。
2. Tracking review「Tracking 复习」
   a. conserving altitude during turning and tracking
      转向和 Tracking 时节省高度
   b. body position and flat-track technique
      身体姿势和平 Track 的技巧

c. 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

3. Flying through the opening「开伞过程中的控制」
   a. shoulders level(use this time to look again at the spot)
   双肩水平（利用这段时间再次看点定位）
   b. flying the canopy through inflation
   控制充气过程中的降落伞
      (1) back risers
      后组提带
      (2) hips and legs stay even through the
      臀部和腿部保持平衡
      （*译者特注：英文原文中这句话没有说完，但与下一行可衔接，或为拆分同一句造成的疏漏*）
   c. deployment (feet together)
   开伞过程（双脚并拢）
4. Dealing with the standard problems becomes more difficult as canopy performance increases.
降落伞性能越高，处理标准故障的难度会加大。
   a. Discuss the following from the perspective of higher-performance canopies:
   从高性能降落伞的角度讨论以下内容：
      (1) line twist「线缠绕」
      (2) premature brake release「刹车棒过早释放」
      (3) locked brake(s)「刹车棒锁死」
      (4) slider-brake system fouling「滑块布和刹车系统缠绕」
   b. Spinning with a smaller canopy results in rapid altitude loss.
   用小尺寸降落伞旋转下降会导致高度的快速损失。
5. Cut away defensively: Look below and behind to make sure you are clear of others.
切伞时要有所防备：看下面和后面，确保周围没有其他人

B. TRAFFIC「交通」

1. 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。
2. Altitude management「高度管理」
   a. use of brakes to stay aloft
   使用刹车棒减少高度损失
   b. relative wing loading
   自己相对与其他人的翼载
      (1) self-assessment
      自我评估
      (2) knowing the wing loading of others
      了解其他人的翼载
   c. placement in the aircraft
   飞机上的位置安排
   d. 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
3. Awareness of others「注意其他跳伞者」
   a. 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。
   b. 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。

c. Fly a straight final approach avoiding S-turns.
最后进近（第三边）要飞得直，避免 S 形转弯。

d. Dealing with other's errors:
如何应对他人的失误：

(1) In the event of a traffic issue, discuss the problem with the canopy pilots who were involved
对于交通出现问题的情况，应与涉事方进行讨论

(2) canopy wake turbulence, (yours and others')
降落伞尾流湍流（自己的和其他人的）

(3) only need to miss by a little—no low turns necessary
避让只需要稍微避开，而不必要低转

4. Off-wind landings (technique)「非逆风着陆（技巧）」
   a. crosswind「侧风」
   b. downwind「顺风」
5. Landing away from the crowd「远离人群着陆」
   a. less pressure; room to practice
   压力小；有练习的空间
   b. 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
6. Situations that pop up:
   遇到突发情况：
   a. 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。
   b. Cutaways disrupt the plan for a normal canopy descent and landing planned for the main canopy.
   切伞会扰乱降落伞的正常下降和着陆计划。
   c. 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。
   d. Off-field landing「场外着陆」
      (1) Plan and follow a sensible pattern.
      规划并遵循合理的航线。
      (2) Keep your eyes open.
      睁大眼睛注意看。
      (3) Perform a PLF.
      执行 PLF。

ADVANCED EXERCISES「高级练习」

A. FLIGHT PLAN「制定飞行计划」

1. The course director should assist the class with an aircraft, canopy flight, and landing plan prior to each jump included in the course.
   课程主管应在课程内的每次跳伞进行前，协助学生制定飞机、降落伞飞行和着陆计划。
2. The plan should include an individualized progression plan for each student, according to experience and goals.
   该计划应囊括根据学生的经验和目标而为每位学生制定的个性化技能提升规划。
3. The plan should consider:
   该计划应考虑：
   a. winds
   风况

b. DZ layout and target areas
基地布局和着落目标区域
c. traffic management to keep clear of other jumpers not participating
交通的管理，要避开其他未参与课程的跳伞者
d. landing separation between canopy students
学生之间的着陆间隔距离

4. Landings should be videotaped for debriefing by the course director.
着陆过程应录像，由课程主管讲解。

B. UNDER CANOPY「开伞后」

1. The aircraft should fly multiple passes as necessary.
必要时，飞机可以多飞几圈，分批次投放跳伞者。
2. Jumpers should arrange their exit order and opening altitudes according to wing loading.
跳伞者应根据翼载来安排出舱顺序和开伞高度。
3. Maintain vertical and horizontal separation; higher canopies should use brakes to slow descent if needed.
跳伞者之间保持垂直和水平方向上的距离间隔；如有需要，高性能降落伞应该使用刹车棒来减缓下降速度。
4. Each jumper needs to allow enough separation for the course director to video each final approach and landing individually.
学生们的着陆需要留出足够的间隔，以便课程主管单独拍摄每个人的最后进近（第三边）和着陆视频。

JUMP 1—EVALUATION JUMP「第 1 跳：评估跳」

1. The first jump in the course follows the presentation and discussion of the ground school topics.
地面课的主题介绍和讨论之后，将进行课程的第 1 跳。
2. The course director evaluates each student's accuracy and landing skills.
课程主管评估各学生的着陆精准度和着陆技能。
   a. Demonstration of a straight-in approach and natural-speed landing provides the course director with a baseline evaluation of flaring and landing skills.
   通过观察学生的直线进近和正常的自然速度下的着陆，课程主管可对其拉平和着陆技能进行摸底评估。
   b. Each student should try for a target, with the first priority being a good landing from a straight-in approach, to provide the course director a starting point for accuracy improvement.
   每位学生都应该尝试精准着陆到一个目标点上，但首要目标还是直线进近并进行良好的着陆，这可为课程主管提供一个提高降落精准度的起点。
3. Each course candidate should inspect the canopy's steering lines while in full flight, with the brakes released.
学生应在释放刹车后全速飞行时检查刹车线。
   a. The steering lines on most canopies should bow slightly behind the back of the canopy and its suspension lines, while in full flight
   大多数降落伞在全速飞行时，刹车线应该稍微处于降落伞布及伞绳后面，并稍微弯曲
   b. Check with the manufacturer to see what is recommended for steering line adjustments
   请咨询制造商，以了解调整刹车线的建议
   c. For jumpers who use front risers, the steering lines should have enough slack that the riser can be pulled with the toggle in hand and still not deflect the tail of the canopy.
   对于使用前组提带的跳伞者，刹车线应有足够的松弛度，以能够在刹车棒握在手中的同时拉动前组提带，并且仍然不会使降落伞后缘偏转。
   d. A parachute rigger should adjust the length of the steering lines if necessary, before the next jump.
   如有必要，在下一次跳伞前，降落伞装备师应调整好刹车线长度。

JUMP 2—BASIC AERODYNAMICS, EFFECTIVE FLARING AND RISER TURNS

「第 2 跳：降落伞的基本空气动力学、有效的拉平和组提带转向」

1. Lift「升力」
   a. Air passing over an airfoil creates a force called lift.
      空气流过翼面产生的，一种称为升力的力。
   b. Lift is always perpendicular to the velocity.
      升力总是垂直于速度方向。
   c. The ram-air 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）的长度则稍微长些。
2. Drag「阻力」
   a. The resistance created by air as an object moves is called drag.
      物体移动时，空气的阻挡称为阻力。
   b. Drag is always parallel to the velocity.
      阻力总是与速度方向平行的。
   c. 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）。
3. Gravity「重力」
   a. 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。
   b. 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。
4. Momentum (force)「动量（力）」
   a. Mass: Doubling the mass of a moving object gives it twice as much energy.
      质量：一个运动物体的质量如果变为原来的 2 倍，则它的动能是原来的 2 倍。
   b. Speed「速度」
      (1) 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，物理上一般称为速率*）。
      (2) Energy increases as the square of the speed.
          动能与速度的平方呈线性关系。
          (i) Doubling the speed produces four times the energy.
              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。
          (ii) Tripling the speed produces nine times the energy.
              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。
      (3) 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。

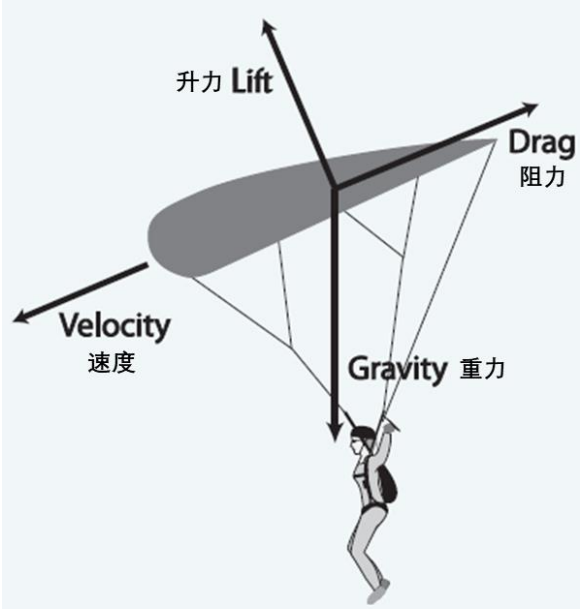


Figure 6-1. The forces acting upon a canopy in flight. **图6-1 飞行中的降落伞的受力分析**

5. Flaring「拉平」
   a. While turning or landing your parachute, the location of your body in relation to the canopy changes.
   当降落伞转向或着陆时，跳伞者的身体相对于降落伞的位置会改变。
   b. In a turn, momentum swings your body out from under the canopy.
   转向时，动量会使身体从降落伞的下方向外甩。
   c. During the recovery arc, your body begins to swing back under the canopy.
   在降落伞恢复原姿态的过程中，身体会重新回到降落伞下方。
   d. On final approach in natural flight your body is below the center of the canopy.
   正常自然飞行的最后进近（第三边）时，身体在降落伞中心的下方。
   e. 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 (higher angle of attack).
   在使用刹车棒或后组提带拉平的初期，降落伞相对后移至跳伞者后上方，伞翼前缘高于后缘，升力暂时增加（攻角增大）。
   f. Pulling the toggles gradually further adds drag on the tail, keeping the canopy at the correct angle and providing the most lift for the remainder of the flare.
   逐渐拉下刹车棒会进一步增加伞翼后缘阻力，使降落伞保持正确的角度，并为剩余的拉平阶段提供最大的升力。
   g. Effective flare techniques with emphasis on finishing the flare.
   有效的拉平技能（重点是拉平的完成阶段）。
      (1) Enter the flare with the ideal stroke rate and depth that causes the canopy to fly as flat as possible, and remain flying flat as long as possible.
      以理想的操作速度和深度进入拉平，使降落伞尽可能平飞，并尽可能长时间保持平飞。
      (2) Follow through by gradually pulling more toggle, timing the rate of the stroke to finish landing just prior to the stall.
      顺势逐渐拉下更多的刹车，并把控好时机，在失速前刚好完成着陆拉平。
      (3) 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.
      在让脚接触地面之前，尽可能长时间地注意控制好降落伞，即使在脚首次接触地面后，也要继续完全做完拉平。

(4) Avoid a common bad habit: Many jumpers stop flying their parachute just as their feet reach the ground, raising the toggles and running out the remaining forward speed.
避免一个常见的坏习惯：许多跳伞者在脚着地的时候就停止控制降落伞，松回刹车棒，然后通过跑步减速。

6. Riser turns「组提带转向」
   a. During this jump you will make a series of riser turns above the traffic pattern altitude.
   在这次跳伞中，学生将在交通航线的高度上方进行一系列组提带转向。
   b. Most jumpers should have already been trained and practiced riser maneuvers as a requirement for the USPA A License.
   大多数跳伞者都应该已经接受过相关训练（练习组提带机动是 USPA A 执照的要求）。
   c. Jumpers who are completely unfamiliar with riser turns should make a separate training jump to focus solely on riser turns.
   完全不熟悉组提带转向的跳伞者应该单独进行一次训练跳伞，专注于组提带转向。
7. Under canopy「开伞后」
   a. Flare the canopy five times while observing the wing throughout the flare.
   进行 5 次拉平，在整个拉平的过程中，仔细观察伞翼。
   b. Pay particular attention to your relative position under the canopy during the various stages of the flare.
   在拉平的不同阶段，特别注意自己相对于降落伞伞翼的位置。
   c. Check airspace frequently to maintain separation during the practice exercises.
   练习时，经常检查空域，以与其他跳伞者保持间隔。
   d. Repeat the five practice flares with eyes closed, paying close attention to the physical sensation during each phase of the practice flare.
   闭上眼睛，重复练习五次拉平，在拉平的每个阶段密切体会身体的感觉。
   e. Check altitude, position and traffic, and initiate two alternating 90-degree turns using rear risers.
   检查高度、位置和交通，并使用后组提带开始两次不同方向的 90 度转向。
   f. Check altitude, position and traffic, and initiate two alternating 180-degree turns using rear risers.
   检查高度、位置和交通，并使用后组提带开始两次不同方向的 180 度转向。
   g. Check altitude, position and traffic, and initiate two alternating 360-degree turns using rear risers.
   检查高度、位置和交通，并使用后组提带开始两次不同方向的 360 度转向。
   h. Jumpers must stop any riser maneuver at 1,000 feet or higher above the ground.
   跳伞者必须在离地 1000 英尺或更高的地方停止任何组提带动作。
   i. Due to the energy required for flaring and riser maneuvers, it may be necessary for jumpers to complete these maneuvers over a series of jumps
   由于拉平和组提带动作所需的力气，跳伞者可能需要在一系列多次跳伞中完成这些动作
   j. On landing「着陆时」
      (1) Make a straight-in approach facing into the wind, with minimal input for the last ten seconds before the landing flare.
      逆风直线进近，在着陆拉平前的 10 秒内，对降落伞的操作要尽量少。
      (2) Practice an effective flaring technique, focusing on a smooth finish.
      练习有效的拉平技能，专注于让拉平的完成阶段平滑顺畅。

JUMP 3—STALLS「第 3 跳：失速」

1. Dynamic stall「动态失速」
   a. Occurs after a dynamic pitch maneuver and is followed by the jumper swinging back under the canopy
   降落伞进行动态俯仰机动后会发生动态失速，随后，跳伞者相对降落伞向后摆
   b. Can cause an abrupt dive once the jumper has reached the end of toggle effectiveness in a flare
   拉平时，一旦刹车的效果消耗结束，就会发生突然的俯冲

c. Sometimes occurs less noticeably at the end of the recovery arc following a diving maneuver, such as a turn
有时，在做会导致俯冲的动作（如转向）后，降落伞姿态恢复的过程结束时，会发生不太明显的动态失速

2. Aerodynamic stall「空气动力失速」
   a. Point that loss of lift occurs as the pilot gradually applies brakes or back risers
   逐渐拉下刹车棒或后组提带时，会有一个升力消失的点
      (1) decreased glide
      降落伞的滑翔能力减弱
      (2) higher rate of descent
      下降速率加快
      (3) stable mode of flight for a ram-air parachute, because of the extremely low center of gravity
      由于重心极低，所以对于冲压空气式降落伞来说，会进入一种稳定的状态
   b. Also called “sink” or “steady state stall”
   这也被称为“下沉”或“稳态失速”
   c. Used in classic accuracy with low-aspect ratio seven-cell canopies
   在经典的精准着陆中，会配合低展弦比七孔落伞利用空气动力失速
3. Full ram-air stall (reverse flight)
   完全的冲压空气式失速（倒退飞行）
   a. Radical stall reached when the tail is held below the level of the nose for an extended period
   当降落伞后缘长时间低于降落伞前缘时，会发生彻底的失速
   b. Can be entered following a dynamic or steady-state stall using toggles or rear risers
   在动态或稳态失速后，使用刹车棒或后组提带可进入完全失速
   c. Requires a smooth, gentle recovery to prevent entanglement or line twist
   需要平稳、温和地恢复，以防止降落伞缠绕或发生线缠绕
   d. Reverse flight using toggles not recommended for some canopies
   有些降落伞不建议使用刹车棒进行倒退飞行
4. High-speed stall「高速失速」
   a. Occurs at any speed when the canopy reaches too high of an angle of attack
   在任何速度下，降落伞攻角过高时，都会发生
   b. Easily induced as a result of distorting the wing too far during a rear-riser flare
   在用后组提带拉平时，由于伞翼变形过大，很容易诱发这种失速
5. Common stall characteristics「常见的失速特性」
   a. Separation of air from the upper surface of the wing
   伞翼上表面与气流（层流附面层）分离
   b. Wing loading and stalls (helpful knowledge for landings):
   翼载和失速（对着陆有用的知识）：
      (1) Higher wing loadings stall at faster forward speeds.
      翼载越高，就会在更高的前进速度下失速。
      (2) Decreasing the wing loading by putting your feet on the ground allows the canopy to fly slower before it stalls.
      脚点地可减小翼载，让伞得以在失速前飞得慢一些。
6. Stall practice「失速练习」
   a. Full ram-air stalls using toggles
   使用刹车棒诱导完全的冲压空气式失速
      (1) Gently apply brakes to a point where forward flight diminishes and the canopy begins to sink.
      温和地下拉刹车棒，到某个位置后，降落伞向前飞行的能力削减，开始下沉。
      (2) Continue to depress the brakes fully down until the canopy “bow ties.”
      继续完全拉下刹车棒，直到降落伞呈“蝴蝶结”状。

(3) Slowly raise the toggles until resuming forward flight.
缓慢地升起刹车棒，直到恢复向前飞行。

(4) High-performance canopies:「高性能降落伞」

(i) Full stalls may induce a line-twist malfunction with cross-braced or highly elliptical canopies and are not recommended.
完全失速可能会导致带交叉支撑设计的降落伞或者椭圆伞型显著的降落伞发生线缠绕故障，不推荐使用。

(ii) Cross-braced and fully elliptical parachutes may be flown to very slow flight and a dynamic or aerodynamic stall without entering reverse flight or "bow tying" the canopy.
采用交叉支撑的降落伞和完全椭圆伞型的降落伞可以飞行到非常慢的飞行速度，进入动态失速或空气动力失速，而不进入倒退飞行或使降落伞呈"蝴蝶结"状。

b. Stalls using rear risers「使用后组提带诱导失速」

(1) Slowly pull down the rear risers until forward flight ceases.
缓慢地拉下后组提带，直到降落伞停止向前飞行。

(2) Adding more riser input, the canopy will eventually sink and begin to descend in a backward direction.
继续拉下组提带，降落伞最终会下沉并开始朝后下降。

(3) Risers should be slowly raised to recover to forward flight.
应缓慢升起组提带，以恢复向前飞行。

(4) Rear riser stalls are not as violent but occur more abruptly than toggle-induced stalls.
后组提带失速不像刹车棒失速那样剧烈，但发生得更突然。

7. Under canopy「开伞后」

a. Practice riser flares and stalls
练习组提带拉平和失速

(1) Rear riser flare without stalling the canopy
后组提带拉平，不拉至降落伞失速

(2) Full ram-air stalls using rear risers
使用后组提带拉至完全的冲压空气式失速

(3) Full ram-air stalls using toggles
使用刹车棒拉至完全的冲压空气式失速

b. Plan and execute an appropriate downwind, base leg and final approach landing into the wind.
规划并执行适当的第一边、第二边和最后进近（第三边）航线，迎风着陆。

JUMP 4—FLAT TURNS AND CROSSWIND LANDINGS「第 4 跳：平转和侧风着陆」

1. Reasons for flying in brakes
带刹车飞行的目的

a. Vertical separation from canopy traffic
拉开与其他降落伞的垂直间距

b. Slow forward speed and descent rate
能以较慢的前进速率和下降速率飞行

c. Returning from a long spot
可从很远的地方飞回来

d. Flat turns as a defense tool at low altitudes
平转在高度较低时比较保险

2. Techniques for initiating a braked turn
启动带刹车转向的技巧

a. Bring both toggles to mid-stall position to start.
将两个刹车棒都拉至不到失速的中间位置。

b. Raise one toggle slightly to turn in the opposite direction.
稍微抬起一侧刹车棒，以向相反侧转向。

c. Pull one toggle down slightly to initiate a turn in the same direction.
稍微拉下一侧刹车棒，以向同一侧转向。

d. Most effective method for flat turns: Raise one toggle slightly and pull the opposite toggle down slightly to initiate a turn in the direction which the toggle is pulled down
平转的最有效的方法是：轻轻地抬起一侧刹车棒，轻轻拉下另一侧刹车棒，以开始朝刹车棒拉下一侧的方向转动

e. Avoid stalling the canopy.
要避免降落伞失速。

3. Effect of brakes on glide
刹车对降落伞滑翔的影响

a. Slower forward speed
较低的前进速率

b. Lower descent rate
较慢的下降速率

c. Change in glide:「滑翔性能的变化」

(1) The pilot needs to experiment to determine the change in glide path at different degrees of flying in brakes.
跳伞者需要进行试验，以确定不同程度刹车时，滑翔航迹的变化。

(2) 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稍微带刹车时，会飞得更平。

(3) Some lower-aspect canopies are designed to sink for a classic accuracy approach, which is less effective when performed under a higher-aspect ratio canopy in low-wind conditions.
一些低展弦比的降落伞被设计成可以刹车至降落伞下沉，用于经典的精准着陆进近，而在低风条件下使用高展弦比降落伞时，这种方法的效果较差。

4. Flaring from a braked position
从刹车状态开始拉平

a. Expect a different glide on a braked final approach.
做好预期，在带刹车进行最后进近时，会有不一样的滑翔航迹。

b. Expect a shorter and quicker stroke needed to flare.
做好预期，着陆所需的拉平会更短更快。

c. Prepare for a harder landing.
为硬着陆做准备。

5. Under canopy「开伞后」

a. Practice flaring several times from the quarter-, half-, and three-quarter-braked positions, and focus on making an effective flare from each position.
从四分之一，二分之一，和四分之三的刹车位置开始练习多次拉平，并专注于从不同位置都能有效进行拉平。

b. Practice braked turns using all the methods discussed.
使用讨论过的所有方法练习带刹车转向。

c. Fly a landing pattern that allows for a crosswind final approach and landing.
飞一个允许在侧风条件下进行最后进近和着陆的着陆航线。

(1) For purposes of training and familiarization, the crosswind landing should only be performed in winds up to five miles per hour.
为了进行训练和提高熟悉度，侧风着陆只能在每小时 5 英里以内的风速下进行。

(2) All jumpers on the same pass must use the same landing pattern to promote a smooth flow of traffic.

同一批跳出飞机的所有跳伞者必须使用相同的着陆航线，以让交通顺畅。

d. On final approach, focus on crosswind correction necessary to prevent crabbing.
最后进近时，要注意侧风修正，以防发生横向漂移。

e. A crosswind landing may require pulling the upwind toggle deeper than the downwind toggle to keep the jumper 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 parachute landing fall is recommended for any unusual landing
侧风着陆时，上风处的刹车棒可能要比下风处的刹车棒拉得更深，以保持飞行方向，并在着陆时降低地速。执行这种不均匀的拉平会提高降落伞的失速速度。对于任何非常规的降落，建议 PLF 着陆。

JUMP 5—LONG SPOT「第 5 跳：长距离飞行」

1. Projected landing point「预计着陆点」
   a. Discovery of how to locate the point on the ground the parachute will reach while flying at natural speed
   学会如何确定降落伞在以正常速度飞行时到达地面的位置
   b. Altering the glide using brakes and rear risers
   通过操纵刹车棒和后组提带以改变滑翔航迹
      (1) Minimize the drag.
      尽量减小阻力。
         (i) Collapse the slider.
         将滑块布折叠好。
         (ii) Pull legs up, arms in, and arch to reduce air resistance
         向上收腿、向内收臂、身体呈弓形，以减少空气阻力
         (iii) Loosen the chest strap to improve glide.
         松开胸带以改善降落伞的滑翔性能。
      (2) If holding brakes, reducing fatigue by hooking your thumbs in the harness. (Be careful not to hook onto your cutaway or reserve ripcord handles.)
      如果要一直拉着刹车棒，可以用拇指钩住背带来减少疲劳。（注意不要钩住切伞或备伞开伞把手）
      (3) Decide by 1,500 feet about a new landing area.
      在 1500 英尺以上确定是否降落到新的着陆区域。
         (i) Allow enough altitude for the final turn.
         为最后的转向留出足够的高度。
         (ii) Expect the winds to weaken as you get lower.
         做好预期，高度降低时，风也会减弱。
   c. 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。
2. Under canopy「开伞后」
   a. 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。
   b. Determine the glide path of the canopy and the landing point using the projected landing point to determine the point on the ground which is neither rising or sinking.
   利用预计着陆点确定降落伞的滑翔航迹和着陆点，即确定视野中，地面上的既不上移也不下移的点。
   c. Alter the glide「改变降落伞的滑翔性能」
      (1) using brakes
      使用刹车棒
      (2) using rear risers
      使用后组提带
      (3) comparison of effectiveness

比较两者的有效性

d. If the intended landing area cannot be reached by an altitude which allows for a safe landing, a reasonable alternative should be used.
如果无法在足够进行场内安全着陆的高度飞到预定着陆区域，则应使用合理的替代方案。

e. On landing, follow the flight plan and continue to work on effective flaring
着陆时，按照飞行计划继续练习有效拉平。

6-12 涉及大范围水平移动的自由落体 Movement Jumps

A. INTRODUCTION「简介」

1. These recommendations provide guidance for a skydive that entails one or more skydivers who are intentionally moving away from the point at which they were dropped, generally in a horizontal orientation that changes pitch and speed throughout the jump.
   本节的建议旨在为那些涉及“一名或多名跳伞者在自由落体过程中刻意进行机动，在水平方向上飞离他们被投放出舱的点位”的跳伞提供指引，这类跳伞一般采用水平身体姿态，可调整身体的俯仰角和飞行速度。
2. The term "movement" in this context includes but is not limited to tracking jumps and angle flying.
   本节所提到的“大范围水平移动的自由落体”包括但不限于 Tracking 和 Angle。
   （*译者注：为表述便利，本节下文简称“此类跳伞”*）
3. Wingsuit jumps are movement jumps but are covered separately in section 6-9 due to several unique considerations.
   翼装飞行也可算作大范围水平移动的自由落体，但因其独特性而在本章第 9 节单独做讲解。

B. QUALIFICATIONS「资质」

1. Before engaging in movement jumps outside of the USPA Integrated Student Program, a participating skydiver (not a leader) should:
   在 USPA 综合学生计划的范畴外，进行此类跳伞之前，参与者（非领队）应满足以下资质条件：
   a. Hold a USPA A license.
      持有 USPA A 执照
   b. Demonstrate proficiency at tracking while maintaining situational awareness.
      能够展示熟练的 Tracking 技能，且 Tracking 的同时能保持态势感知意识
2. Before engaging in movement jumps as the leader, the skydiver should have:
   在进行此类跳伞之前，团体跳伞的领队应满足以下资质条件：
   a. At a minimum, qualified for the USPA C-license.
      至少持有 USPA C 执照
   b. 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
   c. Proficiency and experience in the discipline
      在此类跳伞中有熟练的技能和丰富的经验
   d. Received formal instruction on:
      曾在以下方面得到过正式的指导：
      (1) 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）
      (2) exit order
          出舱顺序
      (3) navigation (move in the correct direction and ability to deploy where planned)
          导航（能朝正确的方向飞行，能在计划位置开伞）
      (4) 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）
      (5) 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）

(6) 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。

3. 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 自由落体飞行角度	Flat 角度平	Shallow 有一些角度	Steep 角度很大
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 on head (belly and back) 能在编队里自己所属的象限中飞行，且能按照预定方向飞行（腹飞和背飞姿态下）	Can fly in quadrant or on level on head (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，并能按照预定方向飞行（腹飞和背飞姿态下），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保持自己应处的相对位置（比象限的要求更精确）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。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」

1. Gear must be properly secured to prevent premature deployment of either canopy.
   装备必须保护好，以防止主伞或者备伞意外过早开伞。
   a. A premature opening at the speeds involved in this type of skydiving could result in severe injury to the body or stressing the equipment beyond limits set by the manufacturers.
      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。
   b. Deployment systems and operation handles should remain secure during inverted and stand-up flight; therefore, equipment for movement jumps should include:
      在此类跳伞中，开伞系统和操作把手应稳妥地固定好；因此，进行此类跳伞时，装备应包含以下配置：
      (1) bottom-of-container mounted throw-out pilot chute pouch, pull-out pilot chute, or ripcord main deployment system
      安装在伞包底部的抛出式引导伞收纳袋、或拉出式引导伞，或拉索式主伞开伞系统
         (i) Exposed leg-strap-mounted pilot chutes present an extreme hazard.
         外露的安装在腿带上的引导伞是极端危险的。
         (ii) Any exposed pilot-chute bridle presents a hazard.
         任何外露的引导伞系带都会造成危险。
         (iii) Use of a tuck-tab is recommended to provide additional security of the pilot chute during high freefall speeds encountered while movement flying.
         建议引导伞配有 Tuck Tab，它在此类跳伞的高速自由落体速度下可为引导伞提供额外的安全保障。（*译者注：引导伞的 Tuck Tab 可减小引导伞意外飞出的可能性*）
      (2) Closing loops, pin-protection flaps, and riser covers well maintained and properly sized
      关包绳、关包针挡盖和组提带挡盖维护良好、尺寸合适。
2. Harness straps
   背带
   a. Leg straps should be connected with a seat strap to keep the leg straps from moving toward the knees.
      两边腿带应用绳子或带子连住，以防止腿带在坐飞或坐飞的转换动作中向膝盖滑动。
   b. Excess leg and chest straps should be tightly stowed.
      腿带和胸带的富余长度部分应固定紧。
3. Automatic activation devices are recommended because of the high potential for collisions and loss of altitude awareness associated with movement jumps.
   建议使用 AAD，因为在此类跳伞中，发生碰撞、丢失高度意识的潜在可能性很高。
4. Personal accessories for movement jumps should include:
   参与此类跳伞的跳伞者应配备以下设备：
   a. audible altimeter (two are recommended)
      声音高度表
   b. visual altimeter
      可目视读数的高度表
   c. hard helmet
      坚固的头盔
   d. 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）应能够在此类跳伞的过程中保持原位，不会影响或阻碍开伞、切伞和备伞把手，以及高度表
   e. GPS
      GPS 导航设备

D. TRAINING「培训」

1. Movement flying has many things in common with face-to-earth formation skydiving.
   此类跳伞和腹飞有很多类似的地方。
   a. A beginner will progress faster and safer with a coach.
      在科目教练的指引下，新手可以更快、更安全地进步。
   b. Novices should not jump with each other until they have—
      新手们不应一起进行此类跳伞，直至—
      (1) received specific training in movement jumps
          接受了针对此类跳伞的培训
      (2) demonstrated the ability to control navigation, pitch and speed
          能展示出导航、俯仰角、速度方面的控制力
2. 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 exit, body position, pitch and speed control and breakoff skills, and progress gradually to larger and more complex movement jumps
   在参与大规模团体进行此类跳伞之前，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、俯仰角、速度的控制力，提升分离技能，然后逐步过渡到更大的更复杂的团体编队。

E. HAZARDS ASSOCIATED WITH MOVEMENT JUMPS「大范围自由落体平移所涉及的危险点」

1. Understanding navigation is of utmost importance. Jumpers must plan accordingly to:
   对导航的深刻理解是极其重要的。跳伞者必须根据情况制定合适计划：
   a. Move off the aircraft's line of flight
      飞离飞机的飞行路线
   b. 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
   c. Avoid other groups in freefall and under canopy
      避开自由落体以及开伞后的其他团体
   d. Open where they've pre-determined
      在预定位置开伞
   e. Account for the DZ terrain
      将跳伞基地降落区的地形因素考虑在内
   f. Have a backup plan if landing out
      为场外着陆制定备用计划
2. Weather is important in the planning phase to determine:
   天气是计划制定阶段中很重要的考虑因素，它会影响以下方面：
   a. Navigation
      导航
   b. Exit Order
      出舱顺序
   c. Coordination with other movement groups
      与其他进行此类跳伞的团体的协调
   d. The current and changing cloud conditions during freefall and canopy flight
      自由落体和降落伞飞行过程中的云层情况以及云层的变化
3. Communication
   沟通
   a. 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:

登机前，非常重要的是要和跳伞基地人员（如跳伞名单登记处、安全和培训顾问、架次安排者）以及同一架次的其他跳伞者沟通告知自己的跳伞意图，以达到以下目的：

(1) Understand local drop zone restrictions and requirements for movement jumps
了解当地跳伞基地对此类跳伞的限制和要求

(2) Share your flight plan
共享飞行计划

(3) Determine exit order
确定出舱顺序

b. It is also important that everyone in the group understand the DZ terrain, hazards, and alternate landing areas (outs)
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（场外降落），这一点也很重要。

4. Movement groups per load. Several factors (e.g., local DZ rules and terrain, weather and leader experience) influence how many movement groups may be safely accommodated per load; however, the general recommendation is to limit movement groups to two per load.
每架次上进行此类跳伞的团体的数量：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。

5. Exit order
出舱顺序

a. The exit order will depend on weather (freefall drift), DZ terrain, deployment altitudes, other groups and DZ rules and considerations
出舱顺序受到这些因素的影响：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

b. Group leader must communicate with the S&TA, DZ, pilot and others on the load
领队必须与安全和培训顾问、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

6. Varied skill levels considerations
团体内成员的不同经验水平应被考虑在内

a. Every jump should meet the skill level of the lowest experienced jumper in order to execute the flight plan and open in the determined spot
为了能正常执行飞行计划，并在预定点位开伞，每次进行此类跳伞时，都应照顾到团体内经验最少的跳伞者的技能水平

b. 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.
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对同一架次上的其他跳伞者造成干扰。

c. 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.
在此类跳伞的过程中，增加速度和俯仰角改变的动作，以及这些动作的状态转换，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。

7. Relativity
与团体中其他成员的相对位置

a. Maintain visual contact with the leader to adapt if you are far behind, above, to the side of or low relative to the group. To avoid collisions, continue moving in the same direction as the group, even if you are far away.

要让领队保持在自己的视野范围内，以在自己落后于团队，或者团队处于自己下方、侧方、上方时进行调整。为了避免碰撞，即使自己离团队很远，也应该与团队保持相同的移动方向。

b. Maintain the same heading (direction) as the rest of the group. Off-heading collisions are more dangerous than collisions between jumpers heading in the same direction.
要与团体内其他成员保持相同的航向。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。

c. Never turn 180 degrees from the group's heading, even if you think there is nobody behind you.
绝对不要 180 度背离团体的航向，即使你认为没有人在你后面。

d. If you've 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.
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。

8. Breakoff. It is crucial to understand the elements of breakoff to avoid congestion and collisions.
分离：深刻理解分离所涉及的要点，以避免拥挤和碰撞，这一点非常关键。

a. Choose a clear path (line) and fan out from the other jumpers while flattening the pitch to a track
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

b. Maintain awareness by looking in all directions
观察各个方向，保持交通意识

c. 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's time to clear airspace and pull
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，直至应执行净空开伞的时候。

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 DZ and share it with the drop zone, load and pilot to confirm you can perform your 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?
你所处的架次的跳伞航线是怎样的？

☐ What are the forecasted winds aloft at these points during your jump?
在以下点位，高空风况的预报是怎样的？

- ☐ Exit altitude
出舱高度
- ☐ Freefall
自由落体
- ☐ Canopy
降落伞飞行
- ☐ Landing Pattern
着陆航线

☐ How many groups and other jumpers on your load?
你所处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平移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 jumpers on your movement jump?
  你的飞行计划是否匹配该次大范围平移自由落体的团体编队中的其他跳伞者的技能水平？

6-13 高速自由落体 Speed Skydiving

A. INTRODUCTION「简介」

1. These recommendations guide skydivers who are intentionally attempting to reach their highest terminal velocity in freefall.
   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。
2. Though speed skydives incorporate elements of both free-flying and angle flying, the high vertical speeds reached present several unique considerations covered in this section. Speeds a speed skydiver achieves will dramatically vary based on skill and experience. Only a tiny minority of top competitors are surpassing the 300mph range. Most beginners, especially those without extensive angles and tunnel experience, will likely be closer to a low 200's top speed.
   尽管高速自由落体包含了自由飞和 Angle 机动的一些元素，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，这些因素会在本节进行讨论。不同跳伞者在进行高速自由落体时所能达到的下落速度的差别很大，主要取决于其技能和经验水平。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。
3. Jumpers can find the competition rules in Chapter 15 of the USPA's Skydivers Competition Manual (SCM).
   USPA 跳伞者比赛手册的第 15 章可找到高速自由落体相关的比赛规则。

B. QUALIFICATIONS「资质」

1. Before engaging in speed skydives, a participating skydiver should:
   在尝试进行高速自由落体前，参与者需要至少达到以下要求：
   a. Hold a C license or higher.
      持有 C 执照或更高级别的执照。
   b. Have made a minimum of 200 jumps.
      跳数在 200 跳以上。
   c. Maintain consistent awareness of altitude and location over the ground.
      能够持续保持高度意识并清楚自己相对于地面的位置。
   d. Jumpers must have their gear inspected by a qualified person.
      装备应由有资质的人进行检查。
   e. Consult a local S&TA or DZO on:
      应就以下事项咨询当地的安全和培训顾问或者跳伞降落区运营方：
      (1) the terrain and alternate landing areas around the DZ.
          地形以及降落区周边的备降场。
      (2) exit order
          出舱顺序
      (3) navigation (move in the correct direction and ability to deploy at the planned altitude and location).
          导航（如何朝正确方向移动，并能够在计划高度和计划位置开伞）
      (4) communication with drop zone authorities, other jumpers and aircraft pilot (to determine jump run and spot)
          与跳伞基地管理者、其他跳伞者、机长的沟通（以确定跳伞航线和看点定位）
      (5) understanding weather (including reading a winds-aloft forecast and maintaining awareness of clouds before jumping)
          了解天气状况（包括阅读高空风预报，以及跳前时刻注意云层状况）
      (6) Jumpers must make a flight plan that includes exit orders, flight plans during freefall, breakoff, and canopy flight path, to avoid other groups.

跳伞者必须制定跳伞计划，该计划应包括出舱顺序、自由落体过程中的飞行计划、分离、降落伞飞行路线，以避开其他跳伞团体。

C. EQUIPMENT「装备」

1. Jumpers must adequately secure their gear to prevent premature deployment of either the main or reserve parachutes.
   跳伞者应采取足够措施确保其装备不发生意外过早开伞（无论是主伞还是备伞）。
   a. Because the speeds in these skydives can surpass the gear's TSO deployments speeds, a premature opening could result in severe injury or death.
      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。
   b. Deployment systems and operation handles should remain secure during inverted flights. Therefore, equipment for speed skydives should include the following:
      倒飞时，开伞系统和操作把手应稳妥地固定好。因此，高速自由落体所用装备应包含以下配置：
      (1) A well-maintained bottom-of- container mounted throw-out pilot chute pouch, pull-out pilot chute, or ripcord main deployment system.
      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，或拉索式主伞开伞系统
         (i) Exposed leg-strap-mounted pilot chutes present a hazard.
         外露的安装在腿带上的引导伞是极端危险的。
         (ii) Any exposed pilot-chute bridle presents a danger.
         任何外露的引导伞系带都会造成危险。
         (iii) Jumpers should use a tuck tab to provide additional security for the pilot chute during high freefall speeds.
         引导伞应配有 Tuck Tab，它在高速自由落体速度下可为引导伞提供额外的安全保障。
         （*译者注：引导伞的 Tuck Tab 可减小引导伞意外飞出的可能性*）
      (2) Closing loops, pin-protection flaps, and riser covers well maintained and adequately sized
      关包绳、关包针挡盖和组提带挡盖维护良好、尺寸合适。
2. Harness straps「背带」
   a. Jumpers must tightly stow excess legs and chest straps.
      腿带和胸带的富余长度部分应绑紧。
3. Jumpers should use an automatic activation device because of the high potential of losing altitude awareness associated with speed skydives.
   应使用 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。
4. Personal accessories for speed skydiving should include the following:
   进行高速自由落体时，应带有以下个人附件：
   a. Two audible altimeters (additional flashing color visuals inside the helmet are highly encouraged). Two audibles are required because the wind noise on a speed skydive may drown out the audible beeps. Jumpers must increase the volume of all audible altimeters to a maximum volume.
      两个声音高度表（强烈推荐额外在头盔内设置彩色闪光视觉提醒装置）。之所以必须使用两个声音高度表，是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。
   b. Visual altimeter
      目视读数的高度表
   c. 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 using additional constraints, e.g., tape). Fogging can occur, and the jumper must have a plan in case vision becomes limited. If a jumper uses an open-face helmet, they must ensure that eye protection is secure and cannot come off.

坚固的头盔 – 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，或者使用额外的限制手段，比如用胶布粘好）

d. Most speed skydivers choose to fly with extremely tight clothing or jumpsuit that helps cut down on drag. Because of this, it requires more remarkable body-flight skills to maintain control. A jumper's chosen attire should not obscure or obstruct deployment, emergency handles or altimeters.
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，以减小阻力。因此，高速自由落体需要跳伞者有更优秀的技能水平，才能保持受控。跳伞者所用的衣物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。

e. Speed measuring device (SMD): A device used to record the real-time, three-dimensional position of the jumper mounted on the skydiver's body or equipment.
测速装置（SMD）：一种可以记录跳伞者实时三维位置的，安装在跳伞者身上或者装备上的装置。

5. Experimentation - While jumpers may in the future begin to modify equipment as the sport progresses, there are a few safety considerations when experimenting with faster speeds:
试验 – 尽管跳伞者可能会在未来随着技术精进而对装备进行改装，当跳伞者试验更高的自由落体速度时，有以下一些安全考量因素：

a. Competition only allows standard skydiving equipment. Jumpers can use aero shaping for implementation during training or experimentation. Jumpers should use caution when making modifications to helmets, as a shape or weight change may result in severe torques created on the neck and spine that could result in severe injury.
跳伞比赛只允许使用标准跳伞装备。在进行训练或者试验时，跳伞者可以使用气动外形更好的装备。在对头盔进行改装时，应特别注意，头盔外形或者重量的改变可能会导致强大的扭力作用在脖子和脊柱上，进而导致重伤。

b. A propulsion system or added weight (belt or vest) is not allowed in competition. However, for training and experimental purposes, such items should be reviewed by an experienced speed skydiver or S&TA before being used.
跳伞比赛中不允许使用推进装置或者配重（无论是腰部配重还是配重背心）。然而，如果是出于训练或者试验目的，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。

c. Using a Tandem rig for speed skydiving is not permitted in competition nor recommended in training.
跳伞比赛中不得使用双人伞进行高速自由落体，也不建议在训练中使用双人伞。

d. New speed skydivers should consider increasing their skill level in a suit with some drag before seeking to minimize their drag by wearing a skintight suit that they may not have the skill set to fly at 200+ mph airspeeds. Jumpers should use a conservative approach when decreasing drag in the speed discipline, relatable to upsizing a wingsuit or downsizing a canopy.
高速自由落体的新手在提升技能水平时，应考虑使用有一定阻力的衣服，如果过早尝试通过穿贴身的衣服来减阻，跳伞者的水平可能不足以应付 200 英里/小时以上的速度。在与速度相关的跳伞科目中（例如使用更大尺寸的翼装，或者降伞），跳伞者在减阻方面应采取保守策略。

D. TRAINING「培训」

1. Speed skydiving is a solo discipline, and participants primarily evaluate their performance by analyzing data from SMD to analyze performance. Speed skydivers can also employ a coach to help analyze data and to film their routines to get further insight through an outside video perspective. The analysis of body-flight performance is just as vital as the recorded data from a speed-measuring device. During a jump with a speed skydiver and coach, 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科目，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以通过外部视角来获得更深入的了解。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，双方都必须通过匹配速度和运动方向来主动降低碰撞风险。

2. Speed skydiving has similar skill sets and elements from free-flying and movement jumps.
   高速自由落体包含了与自由飞、涉及大范围水平移动的自由落体这两个科目类似的技能和元素。
   a. A beginner will progress faster and safer with a coach.
      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。
   b. Novices should not attempt speed skydiving until they have—
      初学者在满足以下条件之前不应该尝试高速自由落体：
      (1) Received training in some combination of tracking, angle flying, tunnel flying, and free- flying.
          至少接受过 Tracking、Angle、风洞、自由飞其中几种的组合训练。
      (2) If possible, demonstrate the ability to control navigation, body pitch and speed.
          如果可能的话，初学者应展示其具备导航、控制身体俯仰角和速度的能力。
3. Angle flying includes many essential skills for novice speed flyers, such as body positions, freefall awareness and flight planning for freefall and canopy. Once proficient with those skills, jumpers can begin their speed career 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. As mentioned above, using a coach will maximize the progression and understanding of this new discipline.
   Angle 机动包含了初学者所需的许多必须技能，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他们的高速自由落体之旅。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、俯仰角控制、速度控制、分离等技能，然后再逐步提高终端速度。正如前文所述，雇佣高速自由落体教练进行指导可以让跳伞者高效提升技能并加深对这一新跳伞科目的理解。
4. Jumpers should breakoff altitude at 5,600 ft. (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 ft. (2,256 meters) below the exit or at breakoff altitude – whichever comes first.
   跳伞者应在离地 5600 英尺（1707 米）的高度分离。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。
5. 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 Hop and Pop 时。
   （*译者注：Hop and Pop 指出舱后马上开伞，这类跳伞一般出舱高度较低*）

E. HAZARDS ASSOCIATED WITH SPEED SKYDIVES「高速自由落体所涉及的危险点」

Before boarding, it is of the utmost importance to communicate your intentions with the drop zone authorities (such as manifest, an S&TA or a loadmaster) and the entire load.
在登机前，至关重要的一点是要和跳伞基地人员（比如跳伞名单登记处、安全和培训顾问、架次安排者）以及同架次的所有人沟通你的跳伞意图。

1. Exit and freefall
   出舱和自由落体
   a. Exit order primarily depends on the speed consistently attained. Once a speed skydiving can demonstrate that they are consistently exceeding normal max free-fly speeds (in excess of approximately 250 mph), speed skydivers who are training should be allowed to exit first and instructed to turn away from jump run. Trained speed skydivers exiting after other jumps is an extreme safety risk. A speed skydiver traveling 300 mph that collides with a solo belly jumper in a baggy suit will have a 200-mph closure rate. With multiple speed skydivers, exit order should be fastest out first, with consideration given to deployment altitudes and parachute type/size if necessary.

出舱顺序主要取决与进行高速自由落体的跳伞者能够保持的速度。进行高速自由落体训练的跳伞者一旦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，并被指示飞离跳伞航线。经过训练的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，如有必要，还要将开伞高度、降落伞类型和尺寸等因素考虑在内。

b. Speed skydivers should be classified as a movement jump and not followed by another movement group when integrating with other disciplines.
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”（见 6-12）同属一类，不得安排以其他跳伞科目进行涉及大范围水平移动的自由落体的跳伞者在其后面出舱。

c. Move off the aircraft’s line of flight
飞离飞机的飞行路线

d. Navigation: remaining on course
导航：保持在既定路线上飞行

e. Maintaining stability in freefall – what to do in case of disorientation
保持自由落体稳定性 – 需要知道如果失去方向感应该怎么做

f. Breaking off / pulling out of the dive at or above 5,600 ft. (1,707 meters) AGL. At 310 mph, a jumper travels at 450ft per second. Consider the resulting horizontal speed.
在离地 5600 英尺（1707 米）的高度以上分离或退出俯冲。如果速度达到 310 英里/小时，跳伞者每秒会移动 450 英尺。应该考虑到这可能导致多高的水平速度。

g. Slowing down to a safe deployment speed is critical. Can be accomplished by transitioning to either the belly or back-flying flight orientations.
减速至安全开伞速度是非常关键的。跳伞者可以通过转换姿态至腹飞或者背飞来减速。

2. Deployment and Canopy-flight
开伞和降落伞飞行

a. A speed skydiver must slow their terminal velocity to “deployment speeds.”
开伞前必须将终端速度减至可以开伞的速度。

b. A parachute deployment, intentional or unintentional, while performing a speed skydive can result in severe injury or death.
在高速自由落体过程中任何有意或者无意的开伞都可能导致重伤或死亡。

c. Deployment should occur at or above 2,500 ft. AGL, per the USPA’s BSR 2-1.I
根据 USPA 基本安全要求（2-1.I），应在离地 2500 英尺以上的高度开伞。

d. A speed skydiver must take great care to avoid other groups that might still be in freefall once under the canopy. Groups to avoid can include jumpers that exit before or after the speed skydiver. Jumpers must control their heading during deployment to continue a perpendicular course from the aircraft’s jump run.
一旦开伞，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。需要避开的团体可能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。在开伞过程中，必须控制好朝向，以能够继续在垂直于跳伞航线的方向上移动。

第七章 跳伞表演和评级

Exhibition Jumping and Rating

SECTION SUMMARY「章节摘要」

A demonstration jump, also called a display or exhibition 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. One purpose of USPA is to promote successful demonstration jumps as part of an overall public relations program for the sport.
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，主要为了观众而在现有的降落区以外的地点进行的跳伞。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。

These recommendations cover the following: experience, ability and attitude, the Professional Exhibition(PRO) Rating, landing area size, technical considerations, insurance, and how to complete the FAA authorization request form.
本节建议包括以下内容：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: All intentional off airport parachute jumps require a certificate of authorization (FAR 105.21). Submit FAA form 7711-2 with the local FSDO to obtain a certificate of authorization. Any jumps made without a certificate of authorization may not be covered under USPA third party liability insurance.
注：所有刻意的，在机场之外的地点进行的跳伞都需要获得授权证书（FAR 105.21 规定）。为申请授权证书，应提交联邦航空局 7711-2 表格至当地飞行标准办公室。任何未获得授权证书的跳伞都不在 USPA 第三方责任保险的覆盖范围内。

IMPORTANT REFERENCE NUMBERS「重要内容参考指引」

- USPA and FAA definitions of landing areas—Table 7.A
  USPA 和联邦航空局的着陆区域定义—表 7.A
- exhibition jump approval requirements—7-1.N
  跳伞表演的批准要求—7-1.N
- PRO Rating requirements for application, renewal, and requalification—7-2
  申请、更新和再鉴定 PRO 评级的要求—7-2
- FAA instructions for completing Form 7711-2—7-3
  联邦航空局 7711-2 表格的填写说明—7-3

WHO NEEDS THIS SECTION?「谁需要这部分」

- jumpers preparing for the USPA PRO Rating
  为 USPA PRO 评级做准备的跳伞者
- jumpers planning exhibition jumps
  计划进行跳伞表演的跳伞者
- USPA officials advising jumpers on exhibition jumps
  为跳伞者提供跳伞表演建议的 USPA 官员

7-1 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.

跳伞表演，也称为演示跳伞或示范跳伞，是指为了奖金、报酬或推广而进行的，主要为了观众而在现有的降落区以外的地点进行的跳伞。

B. HOW TO APPROACH A DEMO JUMP「如何进行演示跳伞」

1. As with all jumps, safety must be the first consideration.
   和所有跳伞一样，安全必须是首要考虑的问题。
2. Next, the most important aspect of a demonstration jump is landing in the target area.
   其次，演示跳伞最重要的一点是在目标区域着陆。
   a. Good aerial work is not impressive if the jumpers land out.
      如果跳伞者在场外着陆，那么跳得再好也无法给人留下深刻印象。
   b. A stand-up landing in the target area is usually the most visible and impressive portion of a demonstration jump.
      在目标区域站降通常是演示跳伞中最显眼和最令人印象深刻的部分。
3. Demo jumps have many variables which must be considered, including wind speed and direction, approach types, equipment type, jumper experience, target areas, and alternate landing areas.
   演示跳伞有许多必须考虑的变量，包括风速和风向、进近类型、装备类型、跳伞经验、着陆目标区域和备降场地。
4. Each proposed demo needs to be evaluated on an individual basis.
   每次演示跳伞都需要根据个人情况评估。

C. EXPERIENCE AND ABILITY「经验与能力」

1. Open Field and Level 1, as defined by USPA and accepted by the FAA (all of the following):
   在开阔场地和一级区域（USPA 定义了这些场地类型，并已获联邦航空局认可，具体见表 7.A，下同）跳伞须满足以下所有条件：
   a. USPA C license or higher
      持有 USPA C 执照或更高级别的执照
   b. minimum 200 jumps
      最少有 200 次跳伞经验
   c. 50 jumps within the past 12 months
      在过去 12 个月内跳过至少 50 次
   d. 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. 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
2. Level 2 and Stadium, as defined by USPA and accepted by the FAA (all of the following):
   在二级区域和体育场跳伞须满足以下所有条件：

a. hold the USPA 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）

b. 50 jumps within the past 12 months
在过去 12 个月内跳过至少 50 次

c. 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

D. ATTITUDE「态度」

1. While a good demonstration jump provides great public relations for the sport, a poorly performed one may severely damage skydiving's image.
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。
   a. Therefore, it is important to 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.
   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。
   b. A mature attitude should be exhibited at all times.
   任何时候都要表现出成熟的态度。
2. Promise no more than you can produce and then perform with expertise and efficiency.
承诺不做超出能力范围的事，然后以专业的技能和效率来跳伞。
3. Take no unnecessary chances.
不冒不必要的风险。
4. Know what you are getting into before getting there.
在做之前应清楚知道自己要做什么
5. Recognize and deal with the air of excitement that surrounds a demo jump.
认识并正确对待演示跳伞所带来的气氛。
6. Make mature and professional judgments in dealing with unforeseen circumstances.
在处理不可预见的情况时，做出成熟和专业的判断。
7. Delay or cancel the demo when conditions are not right for a safe jump.
当条件不适合安全跳伞时，延迟或取消跳伞。
8. Jumpers and support staff should have a sharp, clean appearance to make a better impression and present a professional image.
跳伞者和后勤人员应有干净整洁的外表，以给人留下更好的印象和展示专业形象。

E. LANDING AREAS「着陆区域」

1. All FAA-authorized demonstration jumps are classified as either Open Field, Level 1, Level 2, or Stadium.
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。
2. USPA with the FAA's concurrence defines these areas as described in Table 7.A, Size and Definition of Landing Areas(inset on previous page).
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 7.A—“着陆区域的大小和定义”（见前页）。
（译者特注：旧版 SIM 的表 7.A 在本段前的页面，2021 年新版 SIM 的表 7.A 在本段后的页面，但未对本段文字作修改）
3. Minimum landing areas for PRO Rating holders:
PRO 评级持有者的最小着陆区域：
   a. 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。

b. 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。

4. Alternate landing areas (run-offs or escape areas) must be considered when evaluating a demonstration jump.
对演示跳伞进行评估时，必须考虑到备降场地（用作加赛区域或逃生区域）。

5. Open bodies of water may be considered for 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 7.A still apply.
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，可考虑开放水域的面积。但是，表 7.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 7.A—SIZE AND DEFINITION OF LANDING AREAS
表 7.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飞英尺，但至少有五千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。

F. TURBULENCE AND TARGET PLACEMENT「乱流和着陆目标的位置」

1. Recommended minimum distances from major obstacles should never be disregarded, especially in windy conditions.
与主要障碍物的建议最小距离不应被忽略，特别是在大风条件下。
   a. Major obstacles affect air currents and can cause turbulence.
   主要障碍物会影响气流，并可能导致乱流（湍流）。
   b. Major obstacles include large buildings and trees.
   主要障碍物包括大型建筑物和树木。
   c. A single tree, pole, fence, etc., is not considered as a major obstacle.
   一棵树、一根杆子、一道篱笆等不被认为是主要障碍物。
   d. Stadium jumps usually involve turbulence that should be considered.
   跳伞进入体育场通常会遇到乱流，应予以考虑。
2. Jumpers should be thoroughly familiar with the turbulent-air flight characteristics of their canopies.
跳伞者应完全熟悉其降落伞在的乱流中的飞行特性。

G. MAXIMUM WINDS「最大风速限制」

1. When considering wind limits, include wind turbulence and the capabilities of the reserve canopy.
当考虑风速的限制时，也应该考虑到乱流和备伞的性能。
2. USPA recommends that all demonstration jumps be conducted with a maximum 15-mph ground wind limitation.
USPA 建议所有演示跳伞的最大地面风速限制为 15 英里/小时。
3. For stadium jumps, the wind should be measured at the top of the stadium, and turbulence should always be anticipated.
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。

H. EQUIPMENT「装备」

1. Main canopy「主伞」
   a. Open Field, Level 1, Level 2 and Stadium: ram-air type recommended by USPA
   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
   b. Level 2 and Stadium: ram-air required by FAA
   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
2. Reserve canopy「备伞」
   a. Open Field: should be steerable
   开阔场地：应使用易于操纵杆的备伞
   b. Level 1, Level 2, and Stadium: ram- air reserve required by FAA
   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
3. Smoke should be hand-carried or attached to an easily ejectable boot bracket.
彩烟应手持携带，或装在快拆的鞋子的支架上。

4. Depending on the type of demonstration jump; it is recommended to use an AAD and an RSL.
视不同类型的演示跳伞而定；建议使用 AAD 和 RSL。

Warning: military type(M-18) smoke grenades are extremely hot and should not be hand held.
警告：军用型（M-18）烟雾弹非常热，不应手持。

I. AERIAL MANEUVERS「空中机动」

1. Aerial maneuvers should be rehearsed, just as any professional would give a show a dry run.
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。
   a. Participants should be aware of their exit point, freefall drift, and opening point.
   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。
   b. Landing on target takes priority over air work.
   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。
   c. One should be prepared to break off, track, or pull high if necessary.
   如有必要，应该准备好分离、Track，或高开。
2. Some suggested freefall maneuvers:
一些自由落体动作的建议：
   a. barber pole:
   理发店旋转彩柱造型：
      (1) Two or more jumpers with two or more colors of smoke exit and hook up.
      两名或两名以上跳伞者带上两种或两种以上颜色的彩烟出舱并连接。
      (2) The jumpers then spin the formation creating a giant barber pole.
      接着编队开始旋转，在空中形成一个巨大的“理发店旋转彩柱”。
   b. starburst: Three or more jumpers exit and form a star, then break, make a 180° turn, and track apart.
   星光造型：三名或三名以上跳伞者出舱，组成一个星形，然后分离，再各做 180° 的转向分开 Tracking。
   c. cutaway:
   切伞
      (1) One jumper opens, cuts away, and deploys a second main canopy.
      一名跳伞者开伞，切伞，并打开第二个主伞。
      (2) The jumper is required to wear three parachutes, one of which must be a TSO'ed reserve, and the reserve must be attached to a TSO'ed harness.
      跳伞者必须带三个降落伞，其中一个必须是通过技术标准规定认证的备伞，且备伞必须连在通过技术标准规定认证的降落伞背带上。
3. Some suggested canopy maneuvers:
一些降落伞机动的建议：
   a. smoke「彩烟」
      (1) After opening, ignite smoke and drop on a ten-foot line.
      开伞后，点燃彩烟，将彩烟悬挂在 10 英尺的绳子上，放下绳子。
      (2) Make a series of turns in one direction.
      做一系列的同一方向的转向。
      (3) The line should be releaseable from the upper end if it becomes necessary.
      如有必要，悬挂彩烟的绳子的上端应设计成可松开的。
      (4) Be careful in crossing over obstacles on approach.
      在进近过程中，越过障碍物时要小心。
      (5) Make sure the smoke container won't burn through the line.
      应确保烟罐不会烧着绳子。
   b. flag「旗帜」

(1) A flag may be attached to the rear lines or dropped below the jumper on a weighted line attached to the leading edge.
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。

(2) A ground crew should catch the flag so that it won't touch the ground.
地勤人员应该抓住旗子，以免它触地。

(3) Larger flags must be folded into a bag or pouch designed to contain the flag and the weight that is attached to the lower leading edge of the flag.
大型旗帜须叠入包中或袋中，包或袋的设计应适合装入旗帜以及连在旗帜前缘下方的配重。

(4) The flag should be deployed over an uncongested area to protect people and property in the event the weight detaches from the flag.
旗帜应该在人员稀少的区域上空展开，以防配重从旗帜上脱落，危及人员和财产的安全。

(5) Before jumping with an unfamiliar flag system, seek out training and advice from a PRO Rated jumper who is familiar with the rigging of the flag and associated components.
在使用不熟悉的旗帜展示系统跳伞之前，请向熟悉旗帜及其相关部件的 PRO 评级跳伞者寻求培训和建议。

c. canopy formation「降落伞编队」

(1) Canopy maneuvers should be performed by only experienced CRW jumpers.
降落伞机动只能由有丰富降落伞编队经验的跳伞者执行。

(2) Efforts to build canopy formations should stop no lower than 2,500 feet AGL.
只能在离地高度 2500 英尺以上尝试建立降落伞编队。

(3) It is much more difficult and dangerous to land a canopy stack on target than it is to land canopies separately.
与单独的降落伞着陆相比，大量降落伞着陆在着陆目标上要困难得多，也危险得多。

d. Radical canopy maneuvers should not be performed below 500 feet.
在 500 英尺以下不应进行激进的降落伞操作。

J. CROWD CONTROL「人群控制」

1. Collisions with spectators present a great danger to the spectator, the jumper, and the well-being of the sport.
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。

a. Reasonable precautions should be taken to keep the spectators out of the landing area.
应采取合理的预防措施，使观众远离着陆区。

b. People not sitting may move toward the target, but they will not always move out of the way of the landing jumper.
站着的观众可能会朝着着陆目标移动，但他们不一定会为正在着陆的跳伞者让路。

2. Jumpers should pick up their equipment immediately after landing.
跳伞者应在着陆后立即收拾装备。

a. Some spectators may decide that skydiving equipment makes good souvenirs.
一些观众可能认为跳伞装备是不错的纪念品。

b. Jumpers who plan on packing in the crowd should protect against equipment damage by spectators' drinks and cigarettes.
计划在人群中演示叠伞的跳伞者应防止观众的饮料和香烟损坏装备。

K. GROUND SIGNALS「地面信号」

1. Ground-to-air communication must be maintained (BSRs).
必须保持地空通信（根据基本安全要求的规定）。

a. This may be accomplished by a radio, smoke, or a panel.
地空通信可以通过无线电、信号烟雾或通讯面板进行。

b. It is best if a backup to the primary signal exists in case the primary signal fails.
主要通信方式应有备份措施，以防发生故障

2. If a Certificate of Authorization (FAA Form 7711-1) is issued, it may require ground-to-air radio communication.
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。

L. ANNOUNCER「播音员」

1. An experienced skydiver on the public address system contributes to a quality demonstration jump.
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。
2. 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.
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，解释任何特别情况，如备伞的启动或跳伞者未落在着陆目标上。
3. The announcer can contribute to crowd control by asking spectators not to enter the target area.
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。

M. OTHER ACTIVITIES「其他活动」

1. Activities after the jump add to the entertainment of the spectators.
跳伞后的活动可增加观众的娱乐性。
2. Packing demonstration:「叠伞演示」
   a. Team members pack their parachutes in view of the spectators.
   跳伞队员们在观众面前叠伞。
   b. Jumpers should pack slowly, explaining each step and answering questions.
   跳伞者应该慢慢地叠伞，解释每一步并回答问题。
   c. Often, this facet of the demonstration is more effective if one person packs while another does the talking.
   通常情况下，一个人叠伞，另一个人讲解的方式会更有效。
3. Answering questions:「回答问题」
   a. Respond to spectator questions politely and factually.
   礼貌地、实事求是地回答观众的问题。
   b. Direct persons interested in jumping to USPA or distribute brochures advertising a drop zone.
   向有兴趣跳伞的人介绍 USPA 或分发宣传跳伞基地的小册子。

N. ADVICE AND APPROVAL「建议和批准」

1. Approval may need to be secured from federal, state, or local officials before a demonstration jump can be performed.
进行演示跳伞可能需要获得联邦、州或地方官员的批准。
2. Local approval「当地政府的批准」
   a. It may be necessary to contact local authorities prior to a jump.
   可能有必要在跳伞前联系当地政府。
   b. The FARs require airport management approval prior to a jump onto the airport (FAR 105.23).
   联邦航空条例要求，在跳伞进入机场之前，需事先得到机场管理层的批准（FAR 105.23）。
   c. A call to the local police is recommended.
   建议电话咨询当地警察。
      (1) They may offer to help in crowd control.
      他们可以帮助控制人群。
      (2) With prior knowledge of the jump, they are less likely to respond to a call, such as, “There has been a mishap, and people are falling out of the sky.”
      如果事先知道跳伞活动，他们就不必对诸如“出事了，有人从天上掉下来”的报警电话过度反应。

3. State approval「州政府的批准」
   a. It may be necessary to contact the state department of aviation.
      可能有必要联系州政府的航空部门。
   b. The local S&TA or Examiner notified of the demonstration jump should be able to assist the organizers in meeting all state requirements.
      接到演示跳伞活动通知的当地安全和培训顾问或考官应能协助组织者满足所有州政府的要求。
4. FAA approval: Almost every jump requires either that the FAA be notified or an air traffic control authorization be received (FAR 105.25).
   联邦航空局的批准：几乎每一次跳伞都需要通知联邦航空局，或者获得空中交通管制的授权（FAR 105.25）。
   a. For any jump, the air traffic control facility having jurisdiction over the airspace at the first intended exit altitude must be notified at least one hour before the jump.
      任何跳伞都必须在跳伞前至少一小时通知对第一次预定离机高度空域具有管辖权的空中交通管制部门。
   b. Congested areas and open air assembly of persons:
      人员密集区域及露天人员集会：
      (1) FAR105.21.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).
      联邦航空条例 105.21.a.规定，在签发授权证书（联邦航空局 7711-1 表格）之前，任何人不得人员密集区域和露天人员集会区域上空跳伞或跳入这些区域。
      (2) Application for authorization, if required, must be filed with the local Flight Standards District Office.
      如有需要，必须向当地飞行标准办公室提出授权申请。
      (3) The FAA's instructions on how to fill out the application, FAA Form 7711-2, are included in SIM Section 7-3.
      关于如何填写联邦航空局 7711-2 表格的说明，请见本手册 7-3 节。
      (4) The local S&TA or Examiner notified of the demo should be able to assist the organizers in meeting all federal requirements.
      接到演示跳伞活动通知的当地安全和培训顾问或考官应能协助组织者满足所有联邦政府的要求。
      (5) An aerial photo and aviation sectional chart marking the location of the jump may be required by the local FSDO.
      当地飞行标准办公室可能需要标示好跳伞的位置的航拍照片和区域航图。
5. Notification and advice:「通知和建议」
   a. The jumper is required by the BSRs to contact the local S&TA or an Examiner for demonstration jump advice.
      基本安全要求规定跳伞者应联系当地的安全和培训顾问或考官，以获取演示跳伞的建议。
   b. The information should be provided as outlined in FAR 105.15.a.
      应按照联邦航空条例 105.15.a 规定的大纲提供相关信息。
   c. The S&TA or an Examiner providing advice for a demonstration jump should use this section as a guideline.
      为演示跳伞提供建议的安全和培训顾问或考官应使用本节内容作为指引。
   d. The Examiner whose advice was sought should contact the S&TA for the area or the drop zone at which the flight will originate.
      寻求建议的考官应与安全和培训顾问联系，以获得飞机始发地或跳伞降落区的信息。
   e. The S&TA should assist the jumpers in meeting all applicable state and federal requirements and check that the requirements have been met.
      安全和培训顾问应协助跳伞者满足所有适用的州和联邦要求，并检查是否已满足要求。
   f. All authorizations and permits should be carried on the jump by the organizer or team captain.
      所有授权证书和许可都应由组织者或团队队长携带。
   g. The S&TA should investigate both the proposed area and the participants.
      安全和培训顾问应考察被提议用来进行跳伞的区域和参与者。

(1) The S&TA or Examiner may recommend the use of specific jumpers or advise the organizer to use only individuals meeting certain experience requirements.
安全和培训顾问或考官可推荐特定跳伞者参与，或建议组织者仅允许满足特定经验要求的个人参与。

(2) General advice allows the organizer greater flexibility in making last-minute substitutions of aircraft and participants.
一般建议允许组织者在最后一分钟灵活替换飞机和参与者。

h. When consulted for a demonstration jump, the S&TA may recommend certain additional limitations such as wind speed and direction, altitude, etc.
当被咨询演示跳伞相关事项时，安全和培训顾问可能会建议增加某些附加限制，如风速、风向、高度等。

i. 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考虑本节的信息，并应提出以下问题："在考虑到所有因素的情况下，是否有足够把握进行安全且专业的演示跳伞？"

O. INSURANCE「保险」

1. 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.
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。
2. Contact USPA Headquarters for information on demonstration jump insurance.
请联系 USPA 总部以了解演示跳伞的保险信息。

P. RELATED READINGS「相关资料」

1. FAA Part 105, Parachute Operations
联邦航空条例第 105 部分，降落伞作业
2. FAA AC 105-2, Sport Parachute Jumping
联邦航空局咨询通告 AC 105-2，降落伞运动
3. FAA AC 91-45, Waivers: Aviation Events
联邦航空局咨询通告 AC 91-45，豁免：航空活动

7-2 专业表演评级 Professional Exhibition Rating

A. WHAT IS A PRO RATING?「什么是 PRO 评级」

1. Working in conjunction with the FAA, USPA issues Professional Exhibition (PRO) Ratings to any USPA member who has met the current requirements for the rating.
   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。
   a. This rating identifies the jumper as highly proficient and accurate in canopy control.
      此评级表示跳伞者在降落伞控制方面非常熟练和精准。
   b. A PRO Rating holder is also knowledgeable in the areas of coordination with the Federal Aviation Administration, obtaining insurance coverage, and providing a professional demonstration of skills on a wing loading of 1.5:1 and below.
      PRO 评级持有者在与联邦航空局进行协调、购买保险、提供专业技能表演（翼载小于或等于 1.5）等方面也有丰富的知识经验。
   c. A High-Performance (HP) endorsement allows PRO-rated members to make exhibition jumps with wing loadings above 1.5:1.
      获得 HP 认证（高性能伞控认证）的 PRO 评级持有者可以进行翼载大于 1.5 的跳伞表演。
2. A USPA PRO Rating is not required for all demonstration jumps but may be a valuable advantage in working with the FAA.
   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。
3. The PRO Rating is recognized by the FAA and serves as a certificate of proficiency.
   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」

1. To initially qualify for a PRO Rating, an applicant must:
   为获得 PRO 评级资格，申请人必须：
   a. be a current member of USPA
      USPA 会员会籍在有效期内
   b. possess a USPA D license
      持有 USPA D 执照
   c. have made two-night jumps (recommended that the first one be a solo and one in a group) with a freefall of at least 20 seconds:
      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）
      (1) with verification of prior night jump training from a USPA Instructor holding a USPA D license, who has also successfully completed two night jumps (does not have to be within twelve months of PRO rating application)
      需由进行夜跳培训的 USPA 教练进行核实，该教练应持有 USPA D 执照，且完成过 2 次夜跳（无需在 PRO 评级申请前 12 月内完成）
      (2) with the advice of an S&TA, in accordance with USPA BSRs
      获得安全和培训顾问的建议，并符合 USPA 基本安全要求
   d. 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立着陆。
      (1) 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。

(i) All of the 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.
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。

(ii) Video footage of each approach and landing must be submitted to the appropriate Regional Director, or the director of safety and training at USPA Headquarters, along with the PRO rating application.
进近着陆的视频必须提交至相应的 USPA 区域经理或 USPA 总部的安全和培训董事，一同提交的还有 PRO 评级申请表。

(iii) Video footage may be submitted via online sharing or by sending the video files 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。

(2) Once the applicant has started the series, he or she 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。

(3) All of the 10 pre-declared jumps in the series must be successful for any in the series to count toward the rating; and in the event of an unsuccessful jump, the applicant must start a new series. At least two must be crosswind approaches and landings into an area 40 feet long by 20 feet wide. The final approach must be 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 英尺的制定区域内。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。

(4) 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。

(5) All declared jumps must be witnessed by either a S&TA, Examiner, USPA Judge or USPA Regional or National Director.
所有申报的跳伞必须由 S&TA、考官、USPA 法官或 USPA 区域经理或全国性经理见证。

(6) The applicant must obtain signatures of the eligible verifying official for each of the ten jumps.
十次跳伞的每一次跳伞，申请人必须取得有资格的验证人员的签名。

e. To qualify for a HP (High Performance) endorsement for the PRO rating, applicants flying a parachute at a wing-loading greater than 1.5:1, make a series of five solo jumps into an area 40 feet long by 20 feet wide using the same model and size canopy.
为了有资格获得 PRO 评级中的 HP 认证（高性能伞控认证），申请人应使用翼载高于 1.5 的伞，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）。

(1) 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。

(i) All of the 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.
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。

(ii) Video footage of each approach and landing must be submitted to the appropriate Regional Director, or the director of safety and training at USPA Headquarters, along with the PRO rating

application.
进近着陆的视频必须提交至相应的 USPA 区域经理或 USPA 总部的安全和培训董事，一同提交的还有 PRO 评级申请表。

(iii) Video footage may be submitted via online sharing or by sending the video files 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。

(2) At least one landing must demonstrate a crosswind approach and landing into an area 40 feet long by 20 feet wide. The final approach must be 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。

(3) 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 heading change must be started and completed no higher than 25 feet AGL. This flared, carving turn is to demonstrate the ability to change heading during the swoop portion of the landing and still maintain 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）

(4) All the five pre-declared jumps in this series must be successful for any in the series to count toward the rating; and 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。

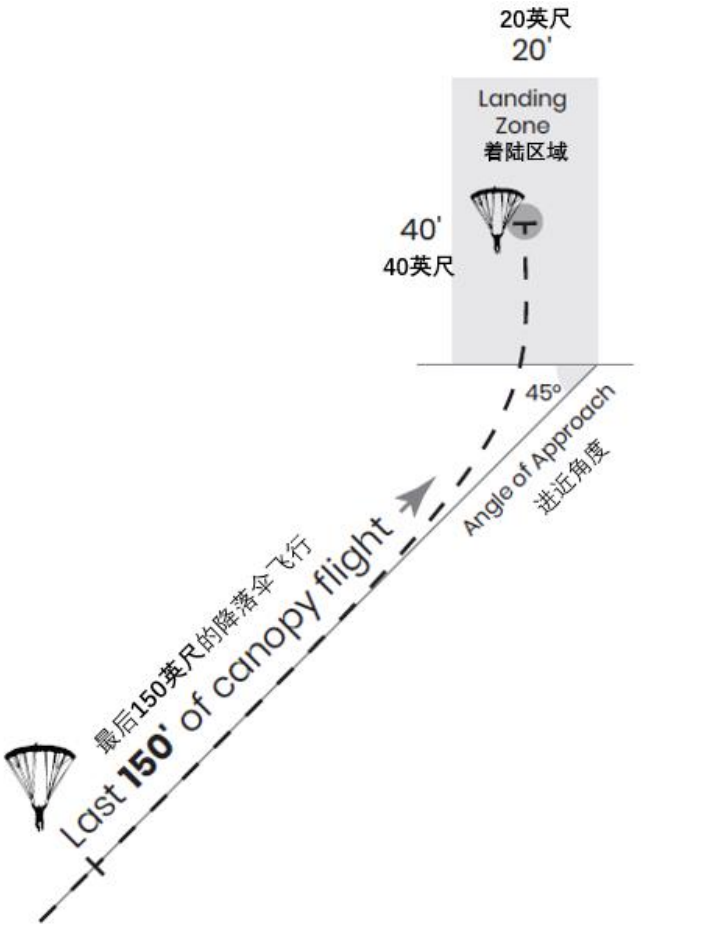


Illustration 7-2.1:High performance endorsement approach and landing requirements as described in 7-2.B.1.f.(3)

图7-2.1 高性能伞控认证所需的进近和着陆要求，如7-2.B.1.f (3)所述

f. The PRO Rating exam is administered by a USPA S&TA, Examiner, Judge or board member and the examining official:

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：

(1) gives the applicant an answer sheet and the questions to the exam
申请人将获得一张答题纸，以及考试题目

(i) No references or other assistance are permitted during the exam.
考试期间申请人不得参考任何资料或寻求帮助

(ii) After the test, the examining official collects the materials and grades the exam.
考试后考官收回考试材料并打分

(iii) A score of 75% is required to pass.
及格分数为 75%

(2) The score is recorded on the license application and in the applicant's logbook.
考试分数会记录在执照申请记录中，以及申请者的跳伞日志中。

(i) An applicant not passing the paper exam will be eligible to retake this exam after seven days.
考试不及格的申请人可在 7 天后补考。

(ii) Applicants who have not passed the USPA online testing program may retest using the same method immediately for a total of three attempts per day.
未通过 USPA 在线考试项目的申请人可用同样的方法（在线考试）立即进行重考，每天最多进行不超过 3 次考试。

g. forward the completed application form to his or her USPA Regional Director for signature and include:
填妥的申请表应送交 USPA 区域经理进行签名，且应同时提交：
(1) the completed PRO Rating exam
已完成的 PRO 评级考试
(2) the rating fee
评级申请费用
(3) the PRO Rating Proficiency card signed off by an Examiner, S&TA, or PRO Rating holder indicating that the PRO Rating applicant has received training in the following areas:
由考官、安全和培训顾问或 PRO 评级持有者签署的 PRO 评级熟练程度卡，表明 PRO 评级申请人接受过以下领域的培训：
(i) ground crew—and served as a ground crew member on at least one Level 1 or Level 2 demo jump
地勤人员培训—且至少 1 次在一级区域或二级区域的演示跳伞中担任地勤人员
(ii) flag rigging—and made at least one jump with a flag
旗帜设备培训—且至少 1 次携带旗帜跳伞
(iii) smoke rigging—and made at least one jump with smoke
彩烟设备培训—且至少 1 次携带彩烟跳伞
(iv) NOTAM filing and certificates of authorization
航空人员通知的提交及授权证书
(v) crowd control
人群控制
(vi) post-jump procedures
跳后程序

h. Except for the minimum 500 ram-air jump requirements, all training listed must be made within the previous 12 months of the application.
除了至少 500 次使用冲压空气式降落伞跳伞的要求外，列出的所有培训必须在申请前的 12 个月内完成。

2. The USPA Regional Director will forward the initial application to USPA Headquarters
USPA 区域经理将初步申请材料转交给 USPA 总部。

3. Conditions「条件」
a. The canopy used during qualification will be the smallest size canopy to be used for minimum landing area(Level 2) jumps, and the canopy size will be noted on the USPA membership card.
资格认证期间使用的降落伞将是被允许用于在最小着陆区域（二级区域）跳伞的最小尺寸的降落伞，该降落伞尺寸将在 USPA 会员卡上注明。
b. USPA will issue an annual PRO Rating with an expiration date that will coincide with the applicant's membership expiration date.
USPA 签发的是年度 PRO 评级，其到期日与申请人的会员到期日一致。
c. The rating must be renewed annually in order to remain current.
评级必须每年更新一次才能保持在有效期内。
d. If a PRO Rating holder's competence is questioned by a FAA or USPA official (including S&TAs), the PRO Rating holder may be required to reaffirm his or her proficiency.
如果联邦航空局或 USPA 官员（包括安全和培训顾问）质疑 PRO 评级持有者的能力，则 PRO 评级持有者可能需要重新接受评估。

C. TO REQUALIFY ON SMALLER CANOPIES「在更小尺寸的降落伞上重新进行评估」

1. To requalify on a smaller canopy with a wing loading of 1.5:1 or below:
使用尺寸更小的，翼载小于或等于 1.5 的降落伞上进行重新评估时：

a. 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.
评级持有者必须连续 3 次进行预先申报的跳伞，首次触地和最终停下来的地方都必须在长 40 英尺、宽 20 英尺的指定区域内。
(1) All of the 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.
申报的跳伞必须通过视频记录，视频内容应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。
(2) Video footage of each approach and landing must be submitted to the appropriate Regional Director, or the director of safety and training at USPA Headquarters, along with the PRO rating application.
进近着陆的视频必须提交至相应的 USPA 区域经理或 USPA 总部的安全和培训董事，一同提交的还有 PRO 评级申请表。
(3) Video footage may be submitted via online sharing or by sending the video files 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。

b. All landings must be made standing up and be verified by a USPA Examiner, S&TA, Judge or board member.
所有着陆都必须为站立着陆，并由 USPA 考官、安全和培训顾问、裁判，或者董事会成员进行核实。

c. The three landings must be logged on the new PRO rating application, and signed by the witness who verified the jump.
这 3 次着陆必须登记到新的 PRO 评级申请表中，并由跳伞见证者核实并签名。

d. The application may then be submitted to USPA Headquarters for processing.
然后申请可提交至 USPA 总部处理。

2. To re-qualify on a smaller canopy with a wing loading greater than 1.5:1:
使用更小尺寸的，翼载超过 1.5 的降落伞进行重新评估时：

a. The rating holder must first meet the qualifications for HP endorsement listed above (ie. five HP qualification jumps must be done first).
评级持有人必须线满足高性能伞控认证的资质，如上所列（也就是说必须先进行 5 次高性能伞控认证跳伞）。

b. 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.
评级持有者必须连续 3 次进行预先申报的跳伞，首次触地和最终停下来的地方都必须在长 40 英尺、宽 20 英尺的指定区域内。
(1) All of the 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.
申报的跳伞必须通过视频记录，视频内容应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
(2) Video footage of each approach and landing must be submitted to the appropriate Regional Director, or the director of safety and training at USPA Headquarters, along with the PRO rating application.
进近着陆的视频必须提交至相应的 USPA 区域经理或 USPA 总部的安全和培训董事，一同提交的还有 PRO 评级申请表。
(3) Video footage may be submitted via online sharing or by sending the video files 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。

c. One jump must be made landing 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。

d. One jump must be a crosswind landing. The final approach must be 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。

e. One jump approach and landing must demonstrate a heading change of at least 45 degrees during the final 150 feet of canopy flight. The heading change must be started and completed no higher than 25 feet AGL. This flared, carving turn is to demonstrate the ability to change heading during the swoop portion of the landing and still maintain 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。

f. All landings must be verified by a USPA Examiner, S&TA, Judge or board member.
所有着陆都必须由 USPA 考官、安全和培训顾问、裁判，或者董事会成员进行核实。

g. The three landings must be logged on the PRO rating application and signed by the witness who verified the jump.
这 3 次着陆必须登记到新的 PRO 评级申请表中，并由跳伞见证者核实并签名。

h. The application may then be submitted to USPA Headquarters for processing.
然后申请可提交至 USPA 总部处理。

D. ANNUAL RENEWAL REQUIREMENTS:「年度续期要求」

1. Within the previous 12 months the PRO holder must perform all the following, verified by the signature of a current USPA S&TA, Examiner, Judge or Board member (you may not renew yourself) and forward a completed PRO renewal application to USPA Headquarters:
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（申请人不得自行续期）签字确认，并将填妥的 PRO 评级续期申请表提交给 USPA 总部：

   a. Make at least 50 jumps.
   至少进行过 50 次跳伞。

   b. Include the current renewal fee.
   提交续期费用。

   c. PRO rating for wing loadings of 1.5:1 and below, in the presence of a USPA Examiner, S&TA, Judge or board member:
   对适用于翼载小于或等于 1.5 的跳伞的 PRO 评级，应在考官、安全和培训顾问或董事会成员在场时完成下列内容：

      (1) perform two stand-up landings, making the first contact and stopping within an area 40 feet long by 20 feet wide.
      进行 2 次站立着陆，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。

      (2) or perform two Level 2 demo jumps (as defined by USPA and accepted by the FAA) with a wing loading 1.5:1 or lower.
      或者，进行过 2 次二级区域的演示跳伞（USPA 对着陆区域类型进行了定义，并已获得联邦航空局的认可）。

   d. HP endorsement for wing loadings over 1.5:1, in the presence of any of a USPA Examiner, S&TA, Judge or board member:
   对适用于翼载超过 1.5 的跳伞的 HP 认证（高性能伞控认证），应在考官、安全和培训顾问或董事会成员在场时完成下列内容：

      (1) meet requirements for wing loadings of 1.5:1 and below, perform two landings, one each to meet the criteria outlined in C.2.d and e of this section making the first contact and stopping within an area 40 feet long by 20 feet wide.
      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，这 2 次着陆分别满足本节 C.2.d 和 e 所列出的要求，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。

(2) or meet requirements for wing loadings of 1.5:1 and below and perform two Level 2 demo jumps (as defined by USPA and accepted by the FAA) with a wing loading above 1.5:1.
或者，完成与翼载小于或等于 1.5 的跳伞相同的要求，并进行 2 次二级区域的演示跳伞（USPA 对着陆区域类型进行了定义，并已获得联邦航空局的认可）。

e. The canopy used to meet annual renewal requirements will be the smallest-sized canopy allowed to be used on demonstration jumps.
为满足续期要求而在评估中使用的降落伞为演示跳伞中可允许使用的最小的伞。

E. LAPSED PRO-RATING RENEWAL REQUIRMENTS「过期 PRO 评级的续期要求」

1. For persons with an expired PRO rating (up to two years), in the presence of a USPA Examiner, S&TA, Judge or board member:
对于持有过期 PRO 评级（最长不超过 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：
   a. for wing loadings of 1.5:1 and below, 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 的跳伞，进行 2 次站立着陆，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。
   b. for wing loadings over 1.5:1, meet requirements for wing loadings of 1.5:1 and below, perform two landings, one each to meet the criteria outlined in C.2.d and e of this 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 的跳伞，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，这 2 次着陆分别满足本节 C.2.d 和 e 所列出的要求，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。
2. If a PRO Rating holder allows his or her rating to lapse for two years or longer, the initial landing qualification requirements must be met.
如果评级过期 2 年以上，则应满足最初的着陆表现要求。
3. If the canopy size used for requalification is larger than the one originally qualified on, it will become the smallest-sized canopy allowed to be used 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。

7-3 联邦航空局 7711-2 表格的填写说明

Instructions for Completing FAA Form 7711-2

Parachute demonstration or exhibitions 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— can be found on both the FAA and USPA websites. Submit the application to the FSDO after completing the form using the following FAA instructions:
在航展、人员拥挤区域或露天人员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：

Applications for parachute jump authorizations made over or into a congested area or open-air assembly of people should be presented at least 10 working days before an event if possible to allow for processing time. Approval or denial of the application must be completed within 5 working days of receipt by the FSDO.
在地面的人员拥挤区域或露天人员集会地点进行跳伞活动的申请，应至少提前 10 个工作日提交，以便有足够时间进行处理。当地飞行标准办公室在收到申请后 5 个工作日内必须完成申请的处理，决定是否批准。

Item 1. [Name of organization] The organization sponsoring the event shall retain sole responsibility for safeguarding persons and property on the surface and shall inform the [Name of issuing FSDO] Flight Standards District Office(FSDO) in writing of the person named to ensure operational safety of the event. When applicable, IIC's should insert the name of the responsible person, found in Item 2 of the application, into the text of the special provisions to indicate the holder of the Certificate of Waiver or Authorization.
第 1 项 [组织名称]主办单位应全权负责地面人员和财产的安全保障，且负责活动安全的人员应以书面形式通知[签发授权证书的当地飞行标准办公室的名称]飞行标准办公室。在适用的情况下，IIC 应在证书的特别条款中插入第 2 项中的负责人姓名，以声明此豁免或授权证书的持有者。

Item 2. The responsible person 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. This person will be responsible to the Federal Aviation Administration (FAA) for the safe conduct of the event on all authorization matters.
第 2 项 负责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。主办单位可为获批准的军方队伍提出申请，但如非获批准的军方队伍，则申请必须由队员提出。此人将对联邦航空局负责所有授权事项的安全操作。

Item 3. 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.
第 3 项 本处信息与第 1 项或第 2 项中所列的授权证书的持有者有关。如果第 1 项中没有列出主办单位，则该信息与第 2 项中的人员名称相关。

Item 4. N/A should be entered unless the application is for banner towing.
第 4 项 除非申请在跳伞过程中牵引横幅，否则应填写 N/A。

Item 5. N/A should be entered unless the application is for banner towing.
第 5 项 除非申请在跳伞过程中牵引横幅，否则应填写 N/A。

Item 6. Enter NONE.
第 6 项 填写 NONE。

Item 7. Example: A four-person sky diving exhibition with flags, banners, smoke and pyrotechnics.
第 7 项 示例：一个四人的跳伞表演，带有旗帜、横幅、彩烟、烟火。

Item 8. Example 1: 1.0 Nm in radius from a point 7.3 Nm on the CVG 270 degree radial from surface to 8,000 feet MS or Example 2: 1.0 Nm in radius from the center of W66 airport.
第 8 项 示例 1：以 CVG 航点 270 度径向线 7.3 海里处为圆心，半径 1 海里的从地面到海拔 8000 英尺高度的区域；示例 2：以 W66 机场中心为圆心，半径 1 海里的区域。

Item 9a. The beginning date and hour of the first jump using UTC (GMT aka Zulu time) pertains to the time the jump aircraft arrives over the jump site.
第 9a 项 第一次跳伞的开始日期和时间（使用 UTC—协调世界时，即 GMT—格林威治时间，俗称 Zulu 时间）为跳伞作业飞机到达跳伞地点的时间。

Item 9b. The date and hour the last jumper is on the ground using UTC.
第 9b 项 最后一名跳伞者降落至地面的日期和时间（使用 UTC 时间）

Item 10. Aircraft make and model to be used, back-up aircraft, pilot(s) name(s) certificate number(s), and home address (also include N-number of aircraft in block(a) if known).
第 10 项 飞行器的品牌和型号、备用飞行器、飞行员姓名、证书编号、家庭住址（如果已知飞行器的机尾编号，还在（a）项中填入）。

Items 11 through 16 are not required for parachuting authorizations, however, the jumpers' names, USPA certificate level and number (if USPA members) should be submitted either in the remarks block or on a separate sheet of paper attached.
第 11 项至第 16 项不是跳伞授权所必须的，但跳伞者的姓名、USPA 证书等级和编号（如果是 USPA 成员）应在备注栏中填写，或在随附的单独纸张上说明。

第八章 会员奖励计划

Membership Awards Programs

SECTION SUMMARY「章节摘要」

USPA presents awards to individual members in recognition of their accomplishments in skydiving. These awards programs have been established to provide both goals and recognition in a variety of fields. Each of these awards represents a significant milestone achieved by an individual skydiver.
USPA 颁发奖项给一些会员，以表彰他们在跳伞方面的成就。设立这些奖项是为了在各个领域提供目标和认可。每个奖项都代表了跳伞者取得的重要里程碑。

Service awards are reserved for special USPA members whose contributions to the organization and the sport meet the criteria established by the award.
服务奖是为特殊的 USPA 会员保留的，他们对 USPA 和跳伞运动的贡献达到了该奖项的标准。

Achievement awards are earned by accumulating numbers of jumps (by thousands) or freefall time (12-hour increments).
成就奖是通过积累跳伞次数（以千次为增量单位）或自由落体时间（以 12 小时为增量单位）来获得的。

Performance awards are presented for accomplishments in canopy formations.
能力表现奖颁发给在降落伞编队方面取得成就的人。

Tenure awards are granted for longevity, measured by years of USPA membership.
资深会员奖根据时间长度授予，以加入 USPA 会员的年数来衡量。

IMPORTANT REFERENCE NUMBERS「重要内容参考指引」

- USPA Chesley H. Judy Safety Award instructions—8-1.3
  USPA Chesley H.Judy 安全奖说明 8-1.3
- Service awards, including recipients of the USPA Lifetime Achievement Award and Gold Medal for Meritorious Service—8-1.4 至 5
  服务奖，包括 USPA 终身成就奖和服务金奖的获得者 8-1.4-5
- Achievement awards, including rules for accumulating number of jumps or freefall time—8-2
  成就奖，包括累计跳伞次数或自由落体时间的相关规则 8-2
- Performance awards, including rules for accomplishments in canopy formation—8-3
  能力表现奖，包括降落伞编队成就的相关规则 8-3
- Tenure Awards—8-4
  资深会员奖 8-4

WHO NEEDS THIS SECTION?「谁需要这部分」

- jumpers applying for USPA awards
  申请 USPA 奖项的跳伞者
- jumpers nominating others for USPA awards
  提名其他人获得 USPA 奖的跳伞者
- USPA officials verifying awards

核实奖项的 USPA 官员

- USPA Board members seeking procedures for awards nominations and selection
  寻求奖项提名和评选程序 USPA 董事会成员
- anyone interested in reviewing some of the most notable USPA members over the years
  任何有兴趣了解多年来涌现的优秀 USPA 会员的人

8-1 服务奖 Service Awards

A. INTRODUCTION「简介」

1. The USPA Membership Services Committee is charged by the USPA Board of Directors with the preparation of recommendations of USPA members who are eligible for major national and international awards, medals, and other special recognitions.
   USPA 会员服务委员会由 USPA 董事会领导，负责为有资格获得重要国家级和国际级奖项、奖牌以及其他特殊认可的 USPA 会员准备推荐信。
2. Final action on these recommendations is the responsibility of the full board of directors, but all members of the association are invited to submit nominations to the Membership Services Committee, via USPA Headquarters, for any and all awards.
   推荐信的最终决议由全体董事进行决策，但协会所有会员都将受邀通过 USPA 总部向会员服务委员会对任一或所有奖项提名候选人。
3. The Membership Services Committee will consider only nominees who have served the cause and interests of skydiving in general and the USPA in particular.
   会员服务委员会的考虑范围仅针对为跳伞行业，特别是为 USPA 做出奉献的被提名人。
4. No current member of the USPA Board of Directors will be recommended by USPA for any award during the term of office.
   USPA 不会推荐任何仍在任期内的 USPA 董事会成员申请任何奖项。

B. PROCEDURES「流程」

Note: the following procedures apply to all service awards except the USPA Chesley H. Judy Safety Award, which is provided in the section for that specific award.
注：下述流程适用于除 USPA Chesley H. Judy 安全奖以外的所有其它服务奖项，USPA Chesley H. Judy 安全奖有专门的小节进行说明。

1. Nominations「提名」
   a. Identify the nominee, including address and telephone number.
      明确被提名人身份，包括其联系地址和联系电话。
   b. Identify the nominator, including email address and telephone number.
      明确提名人身份，包括其邮箱和联系电话。
   c. Prepare the citation in 30 words or less capturing the essence of the achievement for which the nominee's name has been submitted.
      提供 30 字以内的描述，简述被提名人针对所申请奖项获得的主要成就。
   d. In 100 words or less, give complete, concise details justifying the award to the nominee, with pertinent background information to assist the committee.
      提供 100 字以内完整并简洁的具体信息，佐证被提名人的获奖理由，并提供相关背景信息以协助委员会开展工作。
   e. Nominations for all USPA awards must be received at USPA Headquarters at least 10 business days prior to the summer USPA Board of Directors meeting.
      所有 USPA 奖项的提名必须在 USPA 夏季董事会会议前至少 10 个工作日提交至 USPA 总部。
   f. Nominations for all non-USPA awards must be received at USPA Headquarters before the next upcoming USPA Board of Directors meeting.
      所有非 USPA 奖项的提名必须在下一次 USPA 董事会会议之前提交至 USPA 总部。
   g. Previous nominations may be considered by the Membership Services Committee in future years without resubmission.
      往期提名无需重复提交，会员服务委员会在后续年份会再次考虑往期的提名。

2. Selection「选拔」
   a. After a review of all nominees proposed, the Membership Services Committee will present to the full board a list of those nominees for which the board's endorsement is requested.
   会员服务委员会对所有被提名人进行审核后，将向全体董事提交一份请求董事会背书认可的被提名人名单。
   b. By a two-thirds majority and secret ballot in closed session, the USPA Board of Directors will select the candidates for the year being considered from those nominations presented by the committee.
   USPA 董事会将举行闭门会议，通过三分之二多数制和无记名投票的方式，从委员会提交的提名中选出进入考虑范围的年度候选人。
   c. If the USPA Board approves nominations for NAA and/or FAI awards, the chair of the Membership Services Committee will forward appropriate letters of recommendation not later than the deadline imposed for the specific award, in support of each candidate endorsed by the USPA Board, together with necessary supporting documents and evidence to the National Aeronautic Association.
   若 USPA 董事会批准了美国国家航空协会（NAA）和/或国际航空运动联合会（FAI）的奖项提名，会员服务委员会主席将在相关奖项规定的截止日期前向美国国家航空协会提交推荐信以及必要的支持文件和证明，以协助 USPA 董事会推荐的候选人申请奖项。
3. Follow-up「后续流程」
   a. The chair will then follow up personally if necessary with each of the aviation organizations sponsoring the various national and international awards to ensure that USPA nominees are properly evaluated.
   如有必要，委员会主席将亲自与颁发相关国家和国际奖项的航空组织进行跟进，以确保 USPA 提名者得到合适的评估。
   b. Within 24 hours of the decision by the USPA Board of Directors to select or nominate a recipient, the President or his designee should notify the recipient of the board's decision.
   在 USPA 董事会决定选择或提名获奖者的 24 小时内，USPA 总裁或其指定人员应将董事会的决定通知获奖者。
   c. Once notification is made, USPA Headquarters will make the decision public.
   一旦发出通知，USPA 总部将公布这一决定。
   d. The Chair of the USPA Membership Services Committee will compose or delegate an author for a suitable article to appear in Parachutist magazine explaining the merits of the recipient and the reasons for the decision of the board.
   USPA 会员服务委员会主席将撰写或委托一位作者撰写一篇合适的文章，发表在“跳伞者”（Parachutist）杂志上，阐明获奖者的优点和董事会做出决定的原因。
   e. Headquarters should consult with the recipient on the time and venue for presentation of the award and it should be presented at an appropriate USPA event where many USPA members are likely to be present.
   总部应就颁奖的时间和地点与获奖者协商，并应在合适的且许多 USPA 会员都会参加的 USPA 活动上颁奖。

8-1.1:FÉDÉRATION AÉRONAUTIQUE INTERNATIONALE(FAI) GENERAL AWARDS 「国际航空运动联合会（FAI）一般奖项」

(All nominations must be received at the NAA's office by April 30 for submission to the FAI by May 31. Refer to fai.org and naa.aero for the most up-to-date information)
（美国国家航空协会（NAA）办公室需要在 4 月 30 日前收到所有提名，以在 5 月 31 日前向国际航空运动联合会（FAI）提交。最新信息请参考网站 fai.org 以及 naa.aero）

A. PAUL TISSANDIER DIPLOMA「PAUL TISSANDIER 证书」

1. The 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.
   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。

2. Each year, the United States may submit the names of up to three candidates.
美国每年最多可以提交三名候选人的名字。

B. FAI HONORARY GROUP DIPLOMA「FAI 团体荣誉奖」

1. As its name implies, the FAI Honorary Group Diploma 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.
顾名思义，FAI 团体荣誉奖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）。
2. Each year, an FAI member may submit the names of two candidates, one for aeronautics and one for astronautics.
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。

C. FAI PARACHUTING AWARDS「FAI 跳伞运动奖」

(FAI parachuting awards are subject to approval by the FAI Parachuting Commission.)
（FAI 跳伞运动奖须经 FAI 跳伞委员会批准）

1. The FAI Gold Parachuting Medal「FAI 跳伞金奖」
   a. The FAI Gold Medal may be awarded annually for an outstanding accomplishment in connection with parachuting, in the realm of sport, safety, or an invention.
   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。
   b. The medal was created by an endowment fund provided by Mr. J.A. Istel, President of Honour of the FAI Parachuting Commission.
   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。
2. 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：
   a. 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
   b. established at least three World Parachuting Records
   至少三次创造世界跳伞纪录
   c. 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）
   d. 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
   e. 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

D. SABIHA GÖKÇEN MEDAL「SABIHA GÖKÇEN 奖牌」

1. For the woman who performs the most outstanding achievement in any air sport in the previous year.
该奖颁发给上一年在任何航空运动中获得最突出成就的女性。
2. The Sabiha Gökcen Medal was created in 2002 upon a proposal from Turk Hava Kurumu, and is supplied by the Turkish NAC. Sabiha Gökcen, 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.
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 Gökcen 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。

8-1.2:NATIONAL AERONAUTIC ASSOCIATION(NAA) SERVICE AWARDS
「美国国家航空协会（NAA）服务奖」

(All nominations must be received at the NAA's office by April 30 for submission to the FAI by May 31. Refer to fai.org and naa.aero for the most up-to-date information)
（美国国家航空协会（NAA）办公室需要在 4 月 30 日前收到所有提名，以在 5 月 31 日前向国际航空运动联合会（FAI）提交。最新信息请参考网站 fai.org 以及 naa.aero）

A. FRANK G. BREWER TROPHY「FRANK G. BREWER 奖」

1. The NAA 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.
   美国国家航空协会 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。
2. NOMINATION PERIOD: May 1 – August 31
   提名期限：5 月 1 日至 8 月 31 日

B. WESLEY L. MCDONALD DISTINGUISHED STATESMAN & STATESWOMAN OF AVIATION AWARDS「WESLEY L. MCDONALD 航空界元老奖」

1. The NAA Distinguished Statesman Award honors 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.
   美国国家航空协会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。
2. A nominee must「被提名人的要求」
   a. 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；
   b. 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。
   c. be well and favorably known as a person of ability and character.
      以其能力和品格而享有盛名。
   d. NOMINATION PERIOD: May 1 – August 31
      提名期限：5 月 1 日至 8 月 31 日

8-1.3:USPA SERVICE AWARDS「USPA 服务奖」

A. USPA LIFETIME ACHIEVEMENT AWARD「USPA 终身成就奖」

1. Introduction「介绍」
   a. Perhaps the most respected honor which is offered by the United States Parachute Association is the USPA Lifetime Achievement Award, which was originally conceived and created in 1970, as a result of an initial gift of $3,000 from an "Anonymous Donor."
      USPA 颁发的最受尊敬的荣誉也许是 USPA 终身成就奖，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。
   b. 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 Achievement Award.

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。

c. 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.
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。

d. The agreement signed on May 13, 1970, between Attorney John Kerr Wilson, acting for the "Anonymous Donor;" General Brooke E. Allen, Executive Director of the National Aeronautic Association, 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.
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。

2. Qualifications for the award: The May 13, 1970, agreement, as accepted by USPA, describes the award itself and the qualifications required of recipients, using this language:
获奖资格：1970 年 5 月 13 日 USPA 所接受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。”

3. Description of trophy「关于奖杯」
   a. 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.
   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。
   b. Traditionally, each year the recipient receives a smaller, eight- inch diameter replica sterling-silver bowl as his or her personal possession.
   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。

4. Other considerations「其他事项」
   a. Traditionally the award is made for the year prior to the year in which it is presented.
   传统上，奖杯是在颁发前一年制作的。
   b. 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, which suggests that the language in the deed is usable more as a guideline than as a strict requirement.
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。

c. 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）。

d. 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。

e. 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.
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。

(1) In practice, this requirement has been extended to forbid a nomination for at least two full years after the end of board service.
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。

(2) It is enlarged to include as ineligible current or former USPA employees, also until at least two years after their employment ends.
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。

B. USPA GOLD MEDAL FOR MERITORIOUS SERVICE「USPA 服务金奖」

1. Background「背景」

a. The USPA Gold Medal for Meritorious Service was established on July 13, 1997, by the USPA Board of Directors.
USPA 服务金奖由 USPA 董事会于 1997 年 7 月 13 日设立。

b. The award given to no more than three recipients per year, in the form of a struck brass medal which measures three inches in diameter, weighs approximately five ounces and is slotted at the top for attachment of a 30-inch gold fabric ribbon.
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。

c. For permanent display at USPA Headquarters is a large wooden plaque measuring two feet by four feet and adorned with an exact replica of the medal along with brass metal strips bearing the name and date of each recipient.
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。

2. Criteria for the award「获奖标准」

a. The USPA Gold Medal for Meritorious Service is to honor outstanding USPA members who, by their efforts over a period of years, have made significant contributions to the skydiving community.
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。

b. 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, camera (film and video),

competition, and safety.
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。

c. 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.
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。

d. 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 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。

C. USPA REGIONAL ACHIEVEMENT AWARD「USPA 区域成就奖」

1. Background「背景」
   a. Many outstanding individuals have contributed to the sport more on a local or regional level. To recognize the contribution of these individuals, the Board of Directors has created this award.
   许多杰出的个人在地方或地区一级为这项运动做出了贡献。为了表彰这些个人贡献，董事会设立了这个奖项。
   b. The award is presented to no more than five recipients per year total, in the form of a certificate.
   该奖项每年以证书的形式颁发给不超过 5 名获奖者。
2. Criteria for the award「获奖标准」
   a. The USPA Regional Achievement Award is to honor 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.
   USPA 区域成就奖是为了表彰 USPA 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。
   b. 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 they have been off the board for at least two years.
   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。
   c. 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 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。

D. USPA CHESLEY H. JUDY SAFETY AWARD「USPA CHESLEY H. JUDY 安全奖」

1. Background「背景」
   a. A fund was established at USPA in 1997 to honor the memory of Ches Judy, former USPA Director of Safety and Training, killed in a skydiving plane crash two years earlier.
   1997 年，USPA 成立了一个基金，以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。
   b. Distribution of the fund was in abeyance pending the development of a suitable safety-related program.
   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。
2. Purpose of the award「奖项的目的」
   a. In 2004, USPA developed a safety award to honor members who had promoted safety in our sport.
   2004 年，USPA 制定了一个安全奖，以表彰在跳伞运动中促进安全水平的会员。
   b. The USPA Board determined that the new award was consistent with the original intent of the Ches Judy

Safety Fund, so therefore designated the new award as the USPA Chesley H. Judy Safety Award.
USPA 董事会认为新的奖项与 Ches Judy 安全基金的初衷一致，因此指定新的奖项为 USPA Chesley H. Judy 安全奖。

3. 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.
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。
4. The award is to be presented on USPA Safety Day in conjunction with the other planned activities for the annual event.
该奖项将与年度活动的其他活动一起在 USPA 安全日颁发。
5. Criteria for the award: 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.
获奖标准：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。
6. Selection and administrative procedures「选拔程序和行政程序」
    a. 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.
    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。
    b. By February 15th, the S&TA requests a certificate from headquarters, either in writing (attention: Safety & Training), or by email to safety@ uspa.org.
    每年 2 月 15 日前，安全和培训顾问以书面形式（致安全和培训相关部门，即在信上标明“ATTN：Safety & Training”）或通过电子邮件发送至 safety@uspa.org 向总部申请证书。
    c. The request should include the correctly spelled name of the recipient and the name of the drop zone.
    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。
    d. USPA will provide the completed certificate to the requesting S&TA for presentation during that year's Safety Day activities.
    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。

8-1.4:RECIPIENTS OF THE USPA LIFETIME ACHIEVEMENT AWARD「USPA 终身成就奖获得者名单」

Note: In absent years, no award was presented.
注：未出现的年份里没有颁发此奖。

1971 Joe Crane (posthumously) [追授], C-1—

"For unselfish and dedicated service as founder, president, and chairman of the board of the National Parachute Jumpers and Riggers and its successor, the Parachute Club of America."
"作为美国跳伞俱乐部及其前身国家跳伞者和装备师协会的创始人、总裁和董事会主席，做出了无私奉献。"

1972 Lew Sanborn, D-1—

"For originating safe and reliable parachute equipment, for pioneering work in freefall photography, and for many other contributions to the sport and USPA."
"发明了安全可靠的降落伞装备，为自由落体摄影进行了开创性工作，以及为跳伞运动和 USPA 做出了许多其他贡献。"

1973 Steve Snyder, D-5—

"For pioneering contributions through the years to the saving of lives and the improvement of parachute equipment."

“多年来为拯救生命和改进降落伞装备做出了开创性贡献。”

1974 United States Army Parachute Team—

“Generous and dedicated sportsmen, celebrated competitors, respected leaders who since 1961 have introduced parachuting at its best to worldwide millions and have brought honor and distinction to the sport.”
“慷慨和敬业的运动员团队，著名的参赛队伍，受人尊敬的领导者，自 1961 年以来，尽其所能向世界各地数百万人介绍跳伞运动，并为该运动带来了荣誉和认可。”

1975 Lowell Bachman, D-700—

“For service to the United States Parachute Association and all competitors as judge and chief judge at countless national championships, and as a dedicated leader in the development of judging excellence.”
“在无数次全国锦标赛上担任裁判和首席裁判，为 USPA 和所有参赛者服务，并作为裁判事业发展的领袖做出奉献。”

1977 Russ Gunby, C-350—

“A founding spirit who saw the future when others doubted. As author, executive director, and P.C.A. president, he gave countless hours to build the early framework of our sport.”
“一个在别人怀疑的时候看到未来的开创者”。作为一名作者、执行董事和美国跳伞俱乐部总裁，他花了大量时间来构建这项运动的早期框架。

1978 Len Potts, D-220—

“In recognition of personal sacrifice and countless contributions to skydiving and this organization spanning our decades as a sport. His past is our present.”
“为表彰其几十年来的个人付出和对跳伞运动和组织的无数贡献。他的过去就是我们的现在。”

1980 Dan Poynter, D-454—

“Prolific author, distinguished instructor, preeminent parachutist, whose service to skydiving spans more than 20 active years.”
“作品丰富的作家，杰出的教练，杰出的跳伞运动员，他为跳伞运动服务超过 20 年。”

1981 Norman E. Heaton, D-565—

“In eleven years of devoted service as executive director, he contributed substantially and uniquely to USPA’s greatest growth.”
“在担任执行董事的 11 年中，他为 USPA 的重大发展做出了巨大而独特的贡献。”

1983 James F. “Curt” Curtis, D-1407—

“A total contributor to our sport and USPA: competitive champion, headquarters executive, drop zone owner, safety officer, director, board chairman.” [For some reason, his service as USPA president was not recorded.]
“对跳伞运动和 USPA 做出巨大贡献：竞赛冠军、总部执行官、基地所有者、安全官、经理、董事会主席。”[由于一些原因，他作为 USPA 总裁的服务没有被记录]

1984 Chuck MacCrone, D-526—

"In recognition of outstanding contributions to sport parachuting and as a testament to his unparalleled service as president, FAI-IPC."
"为了表彰他对跳伞运动的杰出贡献，也为了证明他作为 FAI-IPC 主席所提供的无与伦比的服务。"

1986 Jack Bergman (posthumously) [追授], D-357—

"USPA Director 1967-1984, Treasurer 1967-1984, National Championships Meet Director 1975-1984. With selfless devotion he gave a quarter century to skydiving and USPA."
"1967-1984 年期间任 USPA 经理，1967-1984 年期间任财务主管，1975-1984 年期间任全国锦标赛总监。他无私地奉献了四分之一个世纪的时间给跳伞运动和 USPA。"

1987 Carl Boenish (posthumously) [追授], D-2556—

"A prolific and talented skydiver whose lifetime of pioneering freefall photography brought unforgettable images and better understanding to fellow jumpers and the public."
"一位作品丰富的，有才华的跳伞者，他一生开创性的自由落体摄影为跳伞者和公众带来了难忘的画面和尊重理解。"

1989 J. Scott Hamilton, D-514—

"For service to USPA and the skydiving world 1967-1979, a Collegiate League director, Safety and Training Committee chairman, and USPA president."
"1967-1979 年间为 USPA 和跳伞界服务，担任大学联赛理事，安全和培训委员会主席，USPA 总裁的职务。"

1990 Ken Coleman (posthumously) [追授], D-12630—

"World and national champion who created the accelerated freefall program."
"创立了 AFF 课程的世界冠军和全国冠军。"

1993 Loy Brydon, D-12 —

"In recognition of major contributions to parachuting in the development of equipment, freefall techniques and competition—an original role model of the total skydiver."
"在跳伞装备、自由落体技能和竞赛方面做出重大贡献，是所有跳伞者的榜样。"

1994 William H. Ottley, D-298—

"In recognition of more than three decades of dedicated service to skydiving and USPA, as board member, vice president and executive director."
"我们对他 30 多年来作为董事会成员、副总裁和执行董事为跳伞运动和 USPA 所做的奉献表示感谢。"

1995 Dick Barber, C-2375—

"For dedicated service to all competitors as a judge at countless U.S. Nationals and world championships, and for the inspiration provided to judges."
"作为无数届国家赛事和世锦赛的裁判，为所有参赛者奉献服务，也激励鼓舞着其他裁判们。"

1997 Clint Vincent, D-7624—

“Selfless service for the betterment of all aspects of skydiving and in support of all skydivers.”
“为改善跳伞运动的各个方面提供无私的服务，为所有跳伞者提供了支持。”

1998 Patrick M. Moorehead, D-2962—

“For unselfish dedication to the United States Parachute Association since 1969 as an ambassador extraordinaire while traveling the world as a member of the board of directors and as a professional skydiving performer.”
“1969 年以来，作为 USPA 的卓越代表，以董事会成员以及专业跳伞表演者的身份巡游世界，为 USPA 做出了无私贡献。”

2002 Jerry (posthumously) [追授] and Sherry Schrimsher, D-7916—

“For their selfless dedication to USPA’s competition and instructional programs and as leaders of the community while serving on USPA’s board of directors.”
“感谢他们无私地致力于 USPA 的竞赛和教学项目，以及在担任 USPA 董事会成员期间作为跳伞界的领袖代表。”

2003 Al Krueger, D-3663—

“For almost 40 years of dedication to the sport and especially USPA as a board member, U.S. Nationals meet director, world skydiving champion, and inspirational visionary.”
“近 40 年来，作为 USPA 董事会成员，国家赛事总监、世界跳伞冠军和鼓舞人心的远见卓识者，一直致力奉献于跳伞运动。”

2004 Gene Paul Thacker, D-167—

“For over 40 years of contributions to USPA and the sport of skydiving, particularly in the Style & Accuracy community as an athlete, coach, leader, inspiration, volunteer, conscience and catalyst.”
“40 多年来对 USPA 和跳伞运动的贡献，特别是在 Style & Accuracy 圈内作为运动员、科目教练、领导者、灵感创造者、志愿者、良知和催人奋进者。”

2007 Jacques-Andre Istel, D-2—

“In recognition of his pioneering spirit as he promoted skydiving in America, United States Parachute Teams, and collegiate parachuting competition while serving the United States Parachute Association and its predecessors.”
“为了表彰他在美国推广跳伞运动时的开拓精神，以及在为 USPA 及其前身工作期间为美国跳伞队和大学跳伞比赛服务。”

2010 Chris Needels, D-1765—

“For almost a half-century of total commitment to USPA as a board member, officer, executive director, and skydiving museum trustee, providing unparalleled leadership, vision and lasting stability.”
“在过去的半个世纪里，作为 USPA 董事会成员、职员、执行董事和跳伞博物馆受托人付出了全部，提供了无与伦比的领导力、远见和持久的稳定性。”

2011 Paul Sitter, D-2714—

"For nearly three decades of service to the U.S. Parachute Association and its members, particularly in the area of safety and training by helping to educate and improve safety for skydivers everywhere."
"为 USPA 及其会员服务了近三十年，特别是在安全和培训领域，帮助各地的跳伞者传播安全知识和提高安全水平。"

2012 King Morton, D-2954—

"For improving the sport, enhancing collegiate skydiving and raising the stature of USPA as a competitor, jumpmaster and instructor and by serving 20 years on the USPA
"作为参赛者、跳伞指导和教练，改进了跳伞运动，推动大学跳伞运动，提高了 USPA 的声望，并在 USPA 服务了 20 年。"

2013 Larry K. Bagley, D-4522—

"For selfless dedication and commitment to the core values of the United States Parachute Association and the skydiving community as advocate, leader and wise counsel for nearly half a century."
"作为近半个世纪的跳伞倡导者、领导者和聪慧的顾问，为 USPA 和跳伞界的核心价值观做出了无私奉献和付出。"

2015 B.J. Worth, D-3805—

"For truly dedicated leadership over more than three decades, serving as USPA National Director, Chairman of the Board and IPC delegate; for promoting the sport through world records and demonstration jumps in front of millions."
"30 多年来，作为 USPA 的全国经理、董事会主席和 IPC 代表，他在这项运动中展示了真正的领导力；通过创造世界纪录和在数百万人面前进行跳伞表演来推动了跳伞运动发展。"

2016 Alvin Lee Schlichtemeier, D-16256—

"In recognition of his unwavering dedication to USPA's financial well-being, his wise counsel as a career-long USPA board member and his contribution to the competition community as a national and international judge."
"为了表彰他对 USPA 财务管理的奉献，和长期作为 USPA 董事会成员期间提供的顾问指导，以及他作为国家和国际竞赛裁判对竞赛圈的贡献。"

2018 Pat Thomas—

"For nearly three decades of advancing the sport of skydiving by sponsoring U.S. competitors and teams, being a leader in the harness-and-container industry and masterfully organizing the Parachute Industry Association Symposium."
"近三十年来，通过赞助美国的竞赛选手和队伍、作为背带和伞包制造行业的领导者、以及高水平地组织降落伞行业协会研讨会，推动了跳伞运动的发展。"

2019 Ray Ferrell, D-5748—

"For more than 40 years of advancing the skydiving industry in myriad ways, including jumper and pilot training, rigging and aviation innovation, world records, competition, business and service to USPA, all while maintaining the highest standards and principles."
"40 多年来以各种方式推动跳伞行业发展，包括跳伞者和飞行员的培训、装备和航空领域的创新、创造世界纪录、参与竞赛、商业业务，以及为 USPA 服务，同时保持最高标准和原则。"

2021 Marylou Laughlin, D-12418—

"For unsurpassed selfless contribution to the sport of skydiving and the United States Parachute Association as a leader, competitor, judge and U.S. representative within the international skydiving community."
"作为领导者、竞赛选手、裁判，以及全球跳伞界的美国代表，对跳伞运动和 USPA 做出了无可比拟的无私奉献。"

2022 Jim Crouch, D-16979—

"For his steadfast dedication to safety as a multi-rated instructor and examiner, jump pilot, rigger, drop zone owner and Parachutist author, and for his service to USPA members as Director of Safety and Training from 2000-2018, a time that saw a drastic reduction in skydiver fatalities and injuries due in large part to his many efforts."
"作为一名拥有多个评级的教练和考官，跳伞作业飞行员，降落伞装备师，跳伞基地所有者和"跳伞者"（Parachutist）杂志作者，他坚定地为跳伞安全做出奉献，在 2000 年至 2018 年间他作为 USPA 安全和培训董事为 USPA 成员提供服务，这段时间内跳伞伤亡的大幅减少很大程度上归功于他的努力。"

2023 Alan King D-4240—

"For providing more than five decades of service to USPA, for his pioneering contributions to safety and training as a USPA Instructor and Examiner and for spearheading the adoption of the USPA AFF Training and Instructor Certification Programs while serving as USPA Deputy Executive Director from 1978-1985."
"为 USPA 服务五十多年，作为 USPA 教练和考官为安全和培训做出开拓性贡献，在 1978 至 1985 年担任 USPA 副执行董事期间率先采用 USPA AFF 培训和教练认证计划。"

8-1.5: RECIPIENTS OF THE USPA GOLD MEDAL FOR MERITORIOUS SERVICE
「USPA 服务金奖获得者名单」

1997 Lorrie Young—

"In recognition of outstanding achievement as a National and International Judge in all skydiving disciplines. Her unwavering dedication to fairness and integrity brought honor, as well as equality, to the judging profession."
"为表彰她在所有跳伞科目中作为国家和国际赛事裁判的做出的杰出成就。她对公平和正直价值观的坚定奉献为裁判行业带来了荣誉和平等。"

1999 Jimmy Godwin, D-126—

"For outstanding and meritorious service to the skydiving community and for sharing his knowledge for over three decades as a Drop Zone owner, rigger examiner, pilot, instructor, and Conference Director."
"为跳伞界提供了杰出服务，以及作为跳伞基地所有者、装备检查者、飞行员、教练和会议主任，分享了他三十年来的知识经验。"

1999 Jerry Bird, D-3299—

"For outstanding and meritorious service to the skydiving community for over thirty years, inspiring jumpers into becoming competitors and for unselfish training and organizing in the field of relative work."
"三十多年来为跳伞界做出的杰出贡献，激励跳伞者参与竞赛，并在相关工作领域进行无私的培训和组织。"

2000 Sandra Williams, D-5829—

"For your unparalleled encouragement to women's participation in skydiving and helping set the benchmark for achievement in our sport."
"感谢她对女性参与跳伞运动的巨大鼓励，并帮助为我们这项运动的成就树立了标杆。"

2001 Dave DeWolf, D-1046—

"In recognition of your decades of service to the sport as a rigging school operator, seminar host and mentor."
"表彰他数十年来，作为装备师学校运营者、研讨会主持人和导师，为这项运动做出的服务。"

2002 Bill Booth, D-3546—

"For over three decades of quality parachute equipment design and manufacture, especially his personal contribution to the concept and promotion of the tandem skydiving system."
"超过三十年的优质降落伞装备设计和制造，特别是对双人伞系统的概念和推广做出个人贡献。"

2002 Ted Strong, D-16—

"For almost a half-century of contribution to the skydiving community as a competitor, a sponsor of numerous US parachute teams, and, most notably, his unique innovation in parachute equipment design including the tandem skydiving system and its importance to the growth of the sport in general and USPA in particular."
"近半个世纪以来，作为参赛者以及众多美国跳伞队的赞助商为跳伞界做出了贡献，最引人注目的是他在跳伞装备设计方面的独特创新，包括双人伞系统及其对跳伞运动的发展以及对 USPA 的重要性。"

2003 Tom Morrison, D-2273—

"In recognition of more than 40 years as an ambassador for the sport of skydiving worldwide and for serving as an inspiration to skydivers of all ages."
"40 多年来，他一直是全球跳伞运动的代表，并鼓舞激励了不同年龄段的跳伞者。"

2003 Fredrick W. "Bill" Wenger, D-3774—

"For over thirty years of leadership and support of the skydiving competition community as a board member, judge, team coach, and national and world champion."
"三十多年来，作为董事会成员、裁判、团队教练以及国家和世界冠军，展现了领导力，为跳伞比赛圈提供了支持。"

2004 Michael J. McGowan, D-5709—

"For promoting our sport through professional aerial photography as a freefall cameraman, and for his innovation in developing freefall photography techniques."
"作为一名自由落体摄影师，通过专业航空摄影推广跳伞运动，以及开发创新自由落体摄影的技术。"

2005 Tom Sanders, D-6503—

"For over a quarter of a century of promoting skydiving in general and USPA in particular as a professional aerial photographer, contributing often to the USPA calendar and Parachutist magazine."

“作为一名专业航空摄影师，在超过四分之一世纪的时间里推广跳伞运动，尤其是 USPA，经常为 USPA 年历和“跳伞者”（Parachutist）杂志供稿。”

2006 James(Jim) Wallace, D-3497—

“In recognition of almost 40 years dedicated to the skydiving community, and especially USPA, with boundless energy and enthusiasm as an instructor, demonstration jumper, U.S. Team member, and movie stuntman.”
“表彰他近 40 年来，作为教练、跳伞表演运动员、美国跳伞队成员和电影特技演员，以无限的能量和热情对跳伞界，尤其是对 USPA 做出的奉献。”

2006 Norman Kent, D-8369—

“For nearly 30 years of contributions to skydiving and the USPA. Norman’s work has put the highest artistic touch on images of our sport that have been seen by millions.”
“近 30 年来一直奉献于跳伞运动和 USPA。他的作品为跳伞运动的形象赋予了最高的艺术感，并为数百万人见证。”

2006 Michael Truffer, D-3863—

“For service to the USPA membership as national director and for his vision and guidance in establishing the U.S. Parachute Team Trust Fund, which has and will continue to support those teams for many years.”
“感谢他作为全国经理为 USPA 会员提供服务，以及他在建立美国跳伞队信托基金方面的远见和指导，该基金多年来一直并持续支持着这些队伍。”

2007 Judy Celaya—

“For almost three decades of dedicated contributions to the worldwide skydiving community as a national and international competition judge, judge course director, and ambassador of the sport.”
“作为国家和国际赛事裁判、裁判课程总监和这项运动的代表，近三十年来为全球跳伞界做出了奉献。”

2007 Chris Gay, D-11504—

“For innovations that have redefined the discipline of canopy formation. Chris Gay made the USA the dominant force in international competitions, improved safety and was instrumental in the 100-way world record organization.”
“他的创新重新定义了降落伞编队这一科目。他使美国成为国际比赛的主导力量，提高了跳伞的安全水平，并在百人造型世界纪录的组织中发挥了重要作用。”

2007 Mike Lewis, D-2071—

“For being one of CRW’s original pioneers. Mike Lewis has been an integral part of every aspect of the discipline’s development including safety, equipment, training, competition and organizing the 100-way world record.”
“作为降落伞编队的原始先驱之一，他一直是这个科目各方面发展不可或缺的一部分，包括安全、装备、培训、比赛和百人造型世界纪录的组织。”

2011 Bill Wood, D-9085—

“For acting as a true worldwide ambassador of skydiving as both a demonstration jumper and leader of the Parachutists Over Phorty Society, and for earning an international reputation as a traveling good-vibes skydiver.”

“作为跳伞表演运动员、‘不惑之年跳伞者’社团的领导者，是一名真正的全球跳伞代表，同时作为一名旅行跳伞者赢得了国际声誉。”

2011 Jeff Steinkamp, A-3451—

“For nearly four decades of service to the competition community as a nationally rated judge and to the accuracy community in particular as an innovator of accuracy events and scoring systems.”
“作为国家级裁判为竞赛圈服务了近四十年，尤其是作为精准降落跳伞比赛和评分机制的创新者，为精准降落跳伞圈服务。”

2012 Perry Stevens, B-106—

“D-51, is recognized for Meritorious Achievement for his reserve-static-line invention, which has saved many skydivers with quick, reliable openings.”
“执照号 D-51，因发明 RSL 而获得优异成就奖，该发明通过快速、可靠的开伞拯救了许多跳伞者的生命。”

2013 Pat Works, D-1813—

“For over 50-years of contribution as a teacher, innovator, author, competitor - and for encouraging and inspiring countless skydivers to advance their skills and find joy in the blue sky.”
“作为一名教师、创新者、作家、参赛者，五十多年来做出巨大贡献，鼓励和激励无数跳伞者提高技能并在蓝天中找到快乐。”

2014 Roger Ponce de Leon, D-5104—

“For forty-six years, Roger “Ponce” has advanced skydiving as a leader and participant on numerous large formation world records, and promoted skydiving as a coach and load organizer throughout the world.”
“四十六年来，他作为众多大型编队世界纪录的领导者和参与者推动了跳伞运动，并以科目教练和架次安排者的身份在世界上推动跳伞运动。”

2015 Carol Clay, D-3347—

“For more than 45 years of skydiving and inspiring jumpers around the world as a competitor, record holder and organizer: for mentoring new skydivers and serving as a role model to women entering the sport.”
“作为一名参赛者、纪录保持者和组织者，在四十五年的时间里进行跳伞运动并鼓舞激励着世界各地的跳伞者：为新跳伞者提供指导，并为参加跳伞运动的女性树立榜样。”

2015 Kate Cooper-Jensen, D-7333—

“For advancing big-way formation skydiving throughout the U.S. and abroad as an organizer and multiple world-record holder. Over the decades, Kate has mentored countless skydivers and been a role model to women skydivers around the world.”
“作为组织者和多项世界纪录保持者，在美国和国外推动大型编队跳伞运动。几十年来，她指导了无数跳伞者，并成为了世界各地女性跳伞者的榜样。”

2015 Alicia Moorehead, D-9821—

“For volunteering for 28 years for the Parachutists Over Phorty Society, serving as USA TopPOP #9, World TopPOP #2 and POPS records administrator: for spreading goodwill around the globe and encouraging others to skydive in their later years.”

“为‘不惑之年跳伞者’社团志愿服务 28 年，担任第 9 任美国 TopPOP、第 2 任世界 TopPOP ，以及 POPS 纪录管理者：在全球传播善心并鼓励其他中老年人跳伞。”

（译者注：POP 是 Parachutists Over Phorty（不惑之年跳伞者）的缩写，TopPOP 的职责是组织举办下一届 POP 锦标赛。）

2016 Bill Jones, D-924—

“For more than six decades of sharing his expertise in both the civilian and military skydiving worlds as a visionary, pioneer, innovator, competitor, coach, master parachute rigger, aircraft mechanic, mentor, drop zone owner and multiple world record holder.”

“作为一名有远见的先驱、创新者、参赛者、科目教练、降落伞装备师、飞机机械师、导师、跳伞基地所有者和多项世界纪录保持者，他在民用和军用跳伞领域分享了超过 60 年的专业知识。”

2016 Robert J Laidlaw, D-32405—

“For more than 40 years of advancing training methods that have produced professional, highly skilled skydiving coaches and instructors; for developing Skydive University; and for sharing that knowledge with USPA for our student and instructional rating programs.”

“40 多年来改进培训方法，并培养出专业、高技能的初级教练和教练；发展了跳伞大学；并为学生和教学评级计划的发展与 USPA 分享知识。”

2017 Chuck Karcher, D-9603—

“For his instrumental role in testing and developing the tandem skydiving system, as well as sport parachute designs; for his groundbreaking work in freefall photography and videography; and for helping to pioneer sit-flying.”

“他在测试和开发双人伞系统以及运动降落伞方面发挥了重要作用；他在自由落体摄影和摄像方面进行了开创性工作；他帮助开创了坐飞姿势。”

2017 Ben L. Crowell (posthumously)[追授], D-15715—

“For developing tandem equipment modifications to enable people with disabilities to experience tandem skydiving and for extensively sharing his expertise to both civilian and military rigging and parachuting.”

“开发了双人伞装备改装，以使残疾人能够体验双人伞，并广泛分享他在民用和军用装备和跳伞方面的专业知识。”

2017 Mark C Baur, D-6108—

“For his contributions and innovations in parachute rigging and equipment, and for many years of teaching and mentoring riggers and skydiving instructors to improve the skill levels of all involved.”

“为表彰他在降落伞装备管理和装备方面的贡献和创新，以及多年来对装备师和跳伞教练的教学和指导，以提高他们的技能水平。”

2018 Greg Windmiller, D-20004—

“For representing true sportsmanship in the U.S. and international skydiving communities as a U.S. Army Golden

Knight, multiple national champion, world record holder and U.S. Team leader and for promoting safety as an instructor and canopy piloting coach."
"作为美国陆军金骑士、多项全国冠军、世界纪录保持者和美国队队长，在美国和国际跳伞界代表了真正的体育精神，并作为跳伞教练和伞控教练促进提升了安全水平。"

2018 Mike Horan, D-881—

"For his instrumental role in preserving the history of skydiving and USPA by serving as the organization's archivist, assembling more than a century of the sport's history and sharing the information freefly with USPA and the skydiving community."
"作为 USPA 的档案管理员，保存了跳伞运动以及 USPA 的历史记录，收集了一个多世纪的跳伞运动历史，并与 USPA 和跳伞社区分享这些信息。"

2018 Mary Bauer, D-8123 and Bob Stumm, D-3604—

"For helping grow the sport by instructing and mentoring countless students, dedicating themselves to running a club drop zone, fostering a culture of safety both at their home DZ and beyond and being pillars in the Wisconsin skydiving community for decades."
"通过教授和指导无数学生，帮助发展了跳伞运动，致力于管理跳伞俱乐部，在当地跳伞基地和其他地方培养跳伞安全文化，并成为威斯康星州跳伞圈几十年来的支柱。"

2019 Bryan Burke, D-8866—

"For three decades of helping improve the safety of the sport by analyzing and sharing accident data and developing procedures for landing and airspace safety; and for serving as meet director for countless national and international competitions."
"三十年来，通过分析和共享事故数据以及制定着陆程序和空域安全程序，帮助提高了跳伞运动的安全性；并担任了无数国内和国际比赛的赛事总监。"

2019 Thomas Jenkins (posthumously) [追授], D-7707—

"For 39 years of dedicated service to skydiving as an instructor, competitor, judge, organizer, mentor and motivator; and for showing a steadfast commitment to skydivers around the world by developing safe practices and leading by example."
"三十九年来，作为一名教练、参赛者、裁判、组织者、导师和激励者，致力于服务跳伞运动；并通过开发安全实践做法并以身作则，向世界各地的跳伞运动员展示坚定的承诺。"

2019 Kirk Knight, D-6709—

"For over 40 years of dedication to skydiving, both military and civilian, as an international judge, competitor and role model, and for his immense contributions to the International Skydiving Museum and Hall of Fame."
"四十多年来，作为一名国际裁判、参赛者和跳伞者榜样，奉献于军用和民用跳伞运动，并对国际跳伞博物馆和名人堂做出巨大贡献。"

2020 Kurt Gaebel, D-18635—

"For connecting and inspiring formation skydivers in the U.S. and worldwide by hosting competitions, providing news

coverage and promoting the sport through the National Skydiving League for 20-plus years."
“20 多年来通过举办比赛、提供新闻报道和通过国家跳伞联盟推广这项运动，在美国和世界各地的编队跳伞者之间建立纽带并激励着他们。”

2020 Yong Chisholm, D-21693—

“For being a pioneering female skydiver, instructional rating holder and competitor and for having a standout career marked by selflessness, caring, humility, enormous skill and a commitment to excellence."
“作为一名先锋女性跳伞者、教学评级持有者和竞赛选手，以及以无私、关怀、谦逊、精湛技能和对卓越的承诺为标志的杰出职业生涯。”

2021 Bram Clement, D-14597—

“For establishing and operating Skydive Ratings, a full-time instructional rating school that offers friendly, structured, professional courses for all USPA ratings and has qualified thousands of highly proficient instructors."
“建立和运营 Skydive Ratings，一个提供友好的、结构化的、专业的、涵盖所有评级的专业课程的全日制教学评级学校，并培育出数千名训练有素的教练。”

2021 Joannie Murphy, C-9720—

“For 50 years dedicated to skydiving, in which she set records, pioneered safety standards, preserved the sport's history and, above all, kept skydiving available to the world in Zephyrhills, Florida."
“在奉献于跳伞事业的 50 年里，她打破了许多记录，创设了许多安全标准，记录了跳伞运动的历史，此外，让佛罗里达州泽弗希尔斯镇的跳伞向世界开放。”

2021 Morris “Moe” Viletto, D-5853—

“For 50 years of rigging innovation, stunt work, technical sewing and mentorship of riggers and jumpers, and for being the architect and pioneer of equipment and techniques for the advancement of the sport through a passionate approach toward improvement, precision and safety."
“50 年间，进行了许多装备创新，特技演示，有丰富的装备材料缝纫经验，指引了许多装备师和跳伞者。是装备和技术的架构师、先驱者，以充满热情的方式推动跳伞运动变得更优良、更精准、更安全。”

2022 Daniel L. Brodsky-Chenfeld, D-8424—

“For inspiring fellow skydivers and the general public as a multi-time world and national champion competitor, record organizer, mentor, DZ manager, educator, motivational speaker and author, and for generously sharing his time, advocating for safety and being one of the foremost ambassadors of the sport for more than 40 years."
“作为多次获得世界冠军和国家冠军的跳伞参赛者、挑战纪录的跳伞活动的组织者、导师、跳伞基地管理者、教育家、励志演说家和作家，他激励着跳伞者和公众，并花许多时间倡导跳伞安全，40 多年来他一直是跳伞运动的杰出代表之一。”

2022 JaNette Lefkowitz, C-35536—

“For raising the level of skydiving worldwide as a top-class competitor, prolific coach, developer of educational materials and organizer of high-profile events, and for working tirelessly to create a strong community for both men and women in the sport."

“作为顶级的跳伞参赛者、成就丰硕的教练、教材开发者和高规格赛事组织者，提高了全球跳伞运动的水平，并且努力为参与跳伞运动的男性和女性创建一个强大的圈子。”

2022 Cheryl Stearns, D-4020—

“For advancing the image of skydiving across the globe as the first female member of the U.S. Army Golden Knights; her unparalleled skill as a three-time world military women’s style and accuracy champion, two-time civilian world champion and multiple world record holder; and for her professionalism and boundless enthusiasm as an exhibition jumper during her 40-plus years of skydiving and more than 21,000 jumps.”
“作为美国陆军金骑士的第一位女性成员，她在全球提升了跳伞运动的形象；作为三届世界军事跳伞比赛的女子 Style and Accuracy 项目的冠军、两届世界跳伞比赛冠军和多项世界纪录保持者，她拥有高超的跳伞技能；作为一名跳伞表演运动员，在她 40 多年间超 21000 次的跳伞中，她展现出了专业精神和无限热情。”

2023 Bob ‘Feisty’ Feisthamel D-7730—

“In recognition of 50-plus years of service, leadership and performance as a drop zone owner and operator, USPA Instructor and Examiner and multi-time national champion and world-record-setting canopy formation skydiver.”
“作为跳伞基地所有者和运营者、USPA 教练和考官，以及多次的全国冠军和参与创造降落伞编队世界纪录的跳伞者，50 多年来，为大家提供服务，展现领导力以及杰出表现。”

2023 Steve Curtis D-20818—

“For achieving greatness as a pioneering freeflyer, multi-time vertical formation skydiving world champion, camera flyer and demonstration skydiver, and for sharing that greatness with others as an instructor and mentor.”
“作为自由飞先驱、多次的 VFS 世界冠军、跳伞摄影师和跳伞表演者获得杰出成就，并作为教练和导师与他人分享成就。”

8-1.6: RECIPIENTS OF THE USPA REGIONAL ACHIEVEMENT AWARD
「USPA 区域成就奖获得者名单」

2014 (Southern) James L. Horak, D-9524—

“For dedicating 34 years to the sport of skydiving. As an instructor, examiner, PRO jumper and rigger, Jim introduced many new individuals to the sport, as well as advanced many through the sport. His love for aviation was reflected in his many ratings and awards involving numerous aeronautical activities.”
“为跳伞运动献身 34 年。作为一名教练、考官、PRO 评级持有者和降落伞装备师，他让许多新人参与跳伞运动，并提高了许多人的跳伞水平。他对航空运动的热爱体现在他在无数航空活动的众多评级和奖项中。”

2014 (Northeast) Gary G. Pond, D-6969—

“For unselfish dedication to our Sport, the Massachusetts Sport Parachute Club, Jumptown and the New England Region. Father, Mentor. Example.”
“为跳伞运动、马萨诸塞州跳伞俱乐部、Jumptown（*译者注：跳伞基地名称*），以及新英格兰区域的跳伞运动做出了无私奉献。是一位优秀的父亲、导师和榜样。”

2014 (Western) Eike H. Hohenadl, D-11851—

“A Gentleman in every respect! Eike had thousands of jumps under his belt and held numerous U.S. Parachute

Association licenses and ratings, including safety and training advisor. He was loved by everyone who knew him and will be sorely missed."
“他是一名全方位的绅士！完成了数千次跳伞，并持有许多 USPA 执照和评级，包括安全和培训顾问。他受到所有认识他的人的爱戴，并且大家都会非常想念他。”

2014 (Eastern) Michael E. Schultz, D-1180—

“In recognition of nearly a half-century of outstanding and varied contributions to sport parachuting in areas of leadership, instruction, drop-zone and aircraft operations, regional and national competition and research and development."
“近半个世纪以来，在领导力、教学、跳伞基地和飞机的运营、地区和国家级比赛，以及研发等领域，对跳伞运动做出了杰出而多样的贡献。”

2014 (Southwest) Radoslav Mulik, D-12537—

“Who founded the Stefan Banic Parachute Foundation, named for the designer of emergency parachutes that saved many aviators' lives in World War I. Since 1977, Mulik has made tireless efforts to promote the foundation and present gold medals to those who have made outstanding contributions to sport parachuting."
“创立了 Stefan Banic 跳伞基金会，该基金会以在第一次世界大战中拯救了许多飞行员的紧急降落伞的设计师的名字命名。1977 年以来，他孜孜不倦地推广该基金会，并将金牌颁发给那些在世界上为跳伞做出杰出贡献的人。”

2015 (Foreign) Gary Lincoln- Hope, D-33675—

“For his outstanding efforts in bringing the sport of skydiving to Kenya, introducing newcomers to the sport and developing activities for experienced skydivers; he transformed skydiving in Kenya from a handful of enthusiasts to a full-fledged sport."
“他不辞辛劳，将跳伞运动带到肯尼亚，将新人带入这项运动，并为有经验的跳伞者组织活动；他让跳伞运动在肯尼亚从少数人的爱好转变为一项成熟的运动。”

2015 (Northeast) Fran Strimenos, D-4957—

“For promoting skydiving throughout the New England Region with a passion for the sport and love of the skydiving community. Over the years, Fran's generosity has shown through her words and actions. She has quietly moved skydiving forward while setting an example for all skydivers, and especially women, in the Northeast to follow."
“带着对跳伞运动的热情和对跳伞圈的热爱，推动了整个新英格兰区域的跳伞运动发展。多年来，她的言行都展现着慷慨大方的气质。她悄悄地推进跳伞运动的进步，同时为东北区域的所有跳伞者，尤其是女性跳伞者树立了榜样。”

2015 (Mid-Atlantic) Edward Ristaino, D-3645—

“For skillfully and selflessly piloting a hot-air balloon in extremely threatening weather, putting the safety of his passengers ahead of his own; for nobly sacrificing his own life to save others, gracefully handling unusually challenging circumstances."
“在极端危险的天气中能够巧妙而无私地驾驶热气球，将乘客的安全置于自身安全之上；他高尚地牺牲了自己的生命，拯救他人的生命，优雅地应对异常具有挑战性的情况”

2016 (Mountain) Brianne M. Thompson, D-30035—

“For her inspiration, motivation and tireless attention to include and train first-time jumpers, students and veterans with challenges and making a way for them to comfortably enter into the sport of skydiving.”
“她将灵感、动力和孜孜不倦的专注倾注于容纳和培训没跳过伞的人、跳伞学生和退伍军人，应对挑战，并让他们能以一种舒适的方式加入跳伞运动。”

2016 (North Central) Donald J. Solberg, D-4270—

“For being a true skydiving pioneer who embodies the indomitable spirit, relentless passion, and unshakeable steadfastness in working to establish and grow the sport of skydiving in North Dakota.”
“作为一名真正的跳伞先锋，他在北达科他州建立和发展了跳伞运动，是不屈不挠的精神、不懈的激情和不可动摇的坚定信念的化身。”

2016 (Northeast) Kenneth D. Newman, D-19754—

“For their partnership in their advocacy and outstanding dedication in encouraging safe teaching for students and the skydiving sport.”
“他们合作倡导安全的学生教学和跳伞运动，并在这些方面做出了杰出奉献。”
（*译者注：根据上下文，这里的“他们合作”应指与下方 Randy Sherman 的合作*）

2016 (Foreign) David Clark Cohen, D-33786—

“For his advocacy and efforts in removing the ban on skydiving in Costa Rica and for inspiring an entire country and a whole new generation of Central American skydivers.”
“他在哥斯达黎加推广跳伞运动，推动取消跳伞禁令，激励着整个国家以及新一代的中美洲跳伞者。”

2016 (Mid-Atlantic) Randy K. Hamberlin, D-21552—

“For his extreme friendliness, professionalism and his efforts at making skydiving the best and safest sport throughout the community.”
“他的无比友善、专业精神以及不懈努力使得跳伞成为所在社区中最好的最安全的运动。”

2016 (Northeast) Randy Sherman, D-20213—

“For their partnership in their advocacy and outstanding dedication in encouraging safe teaching for students and the skydiving sport.”
“合作倡导安全的学生教学和跳伞运动，并在这些方面做出了杰出奉献。”
（*译者注：根据上下文，这里的“他们合作”应指与上方 Kenneth D. Newman 的合作*）

2017 (North Central) Miles J. Hubbard, D-5808—

“For 44 years of continuous jumping at least once a month; for helping bring the AFF program to the Midwest; for mentoring both students and instructors throughout the region; and for his unwavering love of the sport of skydiving.”
“连续 44 年至少每月一次跳伞；帮助将 AFF 带到中西部区域；指导整个区域的学生和教练；展现了对跳伞运动的坚定热爱。”

2017 (Southern) Harry Ervin, D-14192—

“For his 50-plus years of dedication to the sport of skydiving as a participant, instructor, mentor and rigger in and around Tennessee.”
“50 多年来作为田纳西州及周边地区的跳伞运动参与者、教练、导师和降落伞装备师。”

2017 (Gulf) Dewayne A. Bruette, D-3136—

“For more than 50 years of dedication to skydiving, including participating in numerous records, volunteering to fund and perform demonstration jumps for children and veterans and showing the public a positive image of the sport.”
“50 多年来致力于跳伞运动，包括参与打破多项纪录，自愿出资为儿童和退伍军人进行演示跳伞，并向公众呈现跳伞运动的积极形象。”

2017 (Western) Doug and Marilyn Wuest, D-6504—

“For 30 years of sharing the fun and camaraderie of skydiving by organizing the well-known Wuest Ways formation skydives at Skydive Perris and Skydive Elsinore and by mentoring countless new skydivers as they progress in the sport.”
“30 年来持续分享跳伞的乐趣和友谊，在 Skydive Perris 和 Skydive Elsinore 组织著名的 Wuest Ways 跳伞团体编队，并指导无数新跳伞者在这项运动中取得进步。”

2018 (Mid-Atlantic) Kevin D. Carver, D-18229—

“For more than 20 years of training and mentoring students, instructors and DZ staff, creating a community of dedicated skydiving professionals and promoting safety and a love of the sport among both civilian and military jumpers in North Carolina and the entire region.”
“20 多年以来培训和指导学生、教练和跳伞基地工作人员，创建了由专注奉献的跳伞专家组成的圈子，并在北卡罗来纳州以及整个区域内的民间和军事跳伞者中促进安全和对这项运动的热爱。”

2018 (Southeast) Brandon D. Radcliff, D-31962—

“For his tireless dedication to fostering a cooperative learning environment that is both safe and fun with high standards of professionalism and creating continuing education that is accessible to all skydivers.”
“他孜孜不倦地以高标准的专业精神致力于营造一个安全的、有趣的、协作的跳伞学习环境，并创建所有跳伞者都可以获得的继续教学项目。”

2018 (Foreign) Marc S. DeTrano, D-22324—

“For keeping skydiving alive in Costa Rica, enforcing safety standards, co-founding the first USPA DZ in the country and being instrumental in getting Civil Aviation to recognize skydiving as a safe and organized activity.”
“让跳伞运动在哥斯达黎加保持活力，执行安全标准，也是该国首个 USPA 跳伞基地的联合创始人之一，并助力让民航当局认可跳伞作为一项安全且有组织的活动。”

2018 (Pacific) Stephen R. Rafferty, D-12337—

“For more than three decades as an instructor and mentor, introducing more than 15,000 students to the sport, sharing his knowledge and passion and inspiring everyone lucky enough to learn from him.”
“作为一名教练和导师，三十多年来，他向超过 15,000 名学生教授跳伞运动，分享知识和热情，并激励了每位有幸向他学习的人。”

2019 (Northwest) John T. Mitchell, D-6462—

"For being a mainstay in the Northwest skydiving community for more than 40 years as an instructor, organizer, fun jumper and mentor; for providing insight to jump pilots as an air traffic controller; and for organizing the annual Leap for Lupus charity boogie."

"40 多年来，作为一名教练、组织者、跳伞者和导师，一直是西北区域跳伞圈的中流砥柱；作为空中交通管制员，增进了跳伞作业飞行员的洞察力；并组织年度的'为红斑狼疮患者而跳伞'（Leap for Lupus）慈善跳伞活动。"

2019 (Pacific) John M. Dobleman, D-7790—

"For nearly four decades of promoting the sport in the Pacific region as a load organizer, fun jumper and world record holder, always supporting safe skydiving and fostering a fun and welcoming drop zone environment for jumpers of all skill levels."

"近 40 年来，作为架次安排者、跳伞者和世界纪录保持者，在太平洋区域推广跳伞运动，始终支持跳伞安全，并为不同技能水平的跳伞者营造有趣的热情的跳伞基地环境。"

2019 (Northeast) Logan R. Donovan, D-31751—

"For aiding in the advancement of canopy piloting in the Eastern region, providing guidance on canopy progression and flight to newer jumpers and organizing local competitions; and for developing the scoring system for canopy piloting competitions that is used both locally and internationally."

"协助提高东部区域的伞控水平，为跳伞新手的伞控和降落伞飞行水平的进步提供指导，并组织当地比赛；以及开发广泛用于当地和国际伞控比赛的评分系统。"

2019 (Mid-Atlantic) James E. Burriss, D-9540—

"For more than 40 years of dedication to skydivers in the Mid-Atlantic region as an instructor, pilot, rigger, Safety & Training Advisor and mentor, always maintaining the highest standards of safety and professionalism and welcoming countless people into the sport."

"40 多年来，作为教练、飞行员、降落伞装备师、安全和培训顾问、导师，致力服务于中大西洋区域的跳伞者，始终保持最高标准的安全和专业精神，并迎接无数人参与跳伞运动。"

2019 (Eastern) Marc P. Nadeau, D-14782—

"For more than 40 years of service to skydivers in the Eastern region as a rigging and skydiving instructor, drop zone owner and Safety & Training Advisor, providing wisdom, insight and expertise to countless skydivers over the years."

"作为降落伞装备教学者和跳伞教练、跳伞基地所有者、安全和培训顾问，为东部区域的跳伞者服务了 40 多年，为无数跳伞者提供了智慧、洞察力和专业知识。"

2020 (Northeast) Matthew F. Madden, D-30212—

"For supporting and advising instructors in the New England Region and for enhancing safety and professionalism in the USPA instructional rating program."

"为新英格兰区域的教练提供支持和建议，并提高 USPA 教学评级计划的安全性和专业性。"

2020 (Central) Lee Baney, D-10487—

“For dedication to the sport of skydiving for 50 years, including as an instructor and demonstration jumper, and for being inspirational to countless new skydivers as they advance their skills.”
“50 年来一直致力于跳伞运动，包括担任教练和演示跳伞者，并在无数跳伞新手提升技能时为他们提供激励。”

2020 (Mid-Atlantic) Steven W. Hetrick, D-8585—

“For 38 years of promoting safety to students and licensed skydivers as an instructor, instructor examiner, Safety and Training Advisor and mentor.”
“38 年来，作为教练、考官、安全和培训顾问、导师，向学生和持执照的跳伞者倡导安全。”

2021 (Pacific) Benjamin T. Devine, D-36111—

“For supporting skydiving in the Pacific Islands and creating the Save Dillingham Airfield organization, leading the fight to keep one of the most popular skydiving destinations open.”
“为太平洋岛屿的跳伞运动提供支持，并创建了‘拯救迪林厄姆机场’组织，领导了斗争，致力于保留这个受欢迎的跳伞目的地。”

2021 (Mountain) Dustin J. White, D-35877—

“For his attention to detail and awareness while acting as a tandem instructor, which resulted in saving the life of an AFF student by catching a critical gear error before the student exited.”
“在担任双人伞教练时，持续关注细节和意识，在一位 AFF 跳伞学生出舱之前发现严重的装备问题，从而挽救了该学生的生命。”

2021 (Southern) Elizabeth Young D-35348—

“For tireless dedication to the sport and the instruction and mentorship of students, specifically through the sisters in Skydiving program, and for supporting women in skydiving and funding women’s cancer research in the Southern region.”
“特别通过跳伞姐妹计划，对跳伞运动做出了不懈奉献，并为学生提供教学和指引。支持妇女跳伞，并资助南部区域的妇女癌症研究。”

2021 (Northeast) Douglas Hendrix, D-34552—

“For his dedication and leadership in the New England Region as a Safety and Training Advisor, instructor, competitor, record-setter and judge, and for his innovative approaches to promoting safety within the sport.”
“在新英格兰区域作为安全和培训顾问、教练、参赛者、纪录创造者和裁判，展现了奉献精神和领导力，并以创新方式促进跳伞运动的安全性。”

2021 (Northeast) Robert J. Goldman, D-10269—

“For outstanding dedication, innovation and leadership in the New England Region’s fun-jumping community, and for his unwavering motivation to help skydivers become better flyers and team players.”
“在新英格兰区域跳伞圈做出了杰出的奉献、创新，并展示领导力，坚定不移地帮助跳伞者变得更优秀，并更善于团队合作。”

2022 (Eastern) Kamuran “Sonic” Bayrasli D-21394—

“For unwavering dedication to promoting skydiving over more than 20 years by mentoring others, creating an atmosphere of camaraderie and making the sport as safe and accessible as possible for new and experienced jumpers alike.”
“在超过 20 年的时间里，通过指导他人、营造充满同志情谊的氛围，并让更多跳伞新手和老手能够更安全地跳伞，坚定不移地推广跳伞。”

2022 (Southeast) Michael T. Anderson D-9493—

“For more than four decades of encouraging and inspiring new and experienced skydivers through hard work, instruction and big-way skydives around the country, all while promoting the sport of skydiving.”
“在超过 40 年的时间里，通过努力工作、教学，以及在美国各地进行大型编队跳伞等方式，鼓励并激励着新老跳伞者，同时推广跳伞运动。”

2022 (Southeast) Patrick W. Fortune D-23918—

“In grateful appreciation of his dedication to planning Flags in The Air, A Skydivers Tribute to 9/11.”
“感谢他为筹划‘空中旗帜—跳伞者对 911 事件的悼念’活动所做出的奉献。”

2022 (International) Yang Luo C-51232—

“For making efforts to promote safety in the fast-growing Chinese-speaking skydiving community by organizing the translation of the Skydiver’s Information Manual and making it accessible to many skydivers who may not read English.”
“通过组织翻译跳伞者信息手册并让许多非英语读者能够使用该手册，在快速壮大的华人跳伞社区中努力促进跳伞安全。”

2022 (Mideastern) Robert D. Gates D-7262—

“For more than 54 years of dedication to skydiving in Northeast Ohio, decades of operating a family legacy drop zone where thousands of skydivers were created and for continuing to educate and mentor the next generation of skydivers.”
“在超过 54 年的时间里，数十年如一日地在俄亥俄州东北部经营着家族跳伞基地，培养了数千跳伞者，并持续教育和引导着下一代跳伞者。”

2023 (Mid-Atlantic) Joey Freeman D-23490—

“For his dedication to the safety of the skydiving community as a USPA Safety and Training Advisor and AFF Instructor and Examiner, and for his continued willingness to help others.”
“作为 USPA 安全和培训顾问、AFF 教练和考官，为跳伞安全做出贡献，并且一直以来助人为乐。”

8-1.7 THE FAI GOLD PARACHUTING MEDAL AWARD RECIPIENTS「FAI 跳伞金奖获得者名单」

1974 Steven Snyder
1984 Domina Jalbert
1992 William Booth
2004 Brenda Reid
2017 B.J. Worth

8-1.8 THE LEONARDO DA VINCI DIPLOMA AWARD RECIPIENTS「达芬奇证书获得者名单」

1974 Richard Fortenberry
1983 Jerry Bird
1989 Cheryl Stearns
2006 Scott Rhodes
2014 Marylou Laughlin
2020 Larry K. Bagley
2022 Brian Pangburn

8-1.9 THE FAUST VRANCIC MEDAL AWARD RECIPIENTS「FAUST VRANCIC 奖获得者名单」

2007 Larry Hill & Ted Wagner

8-1.10 MCDONALD DISTINGUISHED STATESMAN AND STATEWOMAN OF AVIATION AWARD RECIPIENTS「WESLEY L. MCDONALD 航空界元老奖获得者名单」

1995 Joseph W. Kittinger Jr.
2011 Len “Lenny” Potts
2022 Cheryl Stearns

8-2 成就奖 Achievement Awards

A. ACHIEVEMENT AWARDS FOR JUMP EXPERIENCE「跳伞经验成就奖」

1. These two types of freefall awards are intended to provide a special kind of recognition to those United States Parachute Association members who have accumulated significant levels of experience in both number of freefall skydives and amount of freefall time.
   以下两类自由落体成就奖旨在向那些在自由落体跳伞次数和自由落体时间上积累了可观经验的 USPA 会员提供特殊的认可。
2. USPA proudly recognizes those members.
   USPA 骄傲地认可这些会员的成就。

B. CUMULATIVE JUMPS AND FREEFALL TIME「累计跳伞次数和累计自由落体时间奖励」

1. Expert Wings are awarded for freefall jumps in 1,000-jump increments.
   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。
2. Freefall Badges are awarded for freefall time in 12-hour increments.
   自由落体徽章根据自由落体时间进行奖励，每累积一次 12 小时自由落体就可以获得该徽章。

C. GENERAL REQUIREMENTS「一般要求」

1. To be eligible for any of these awards a person must:
   要获得这些奖励，申请者必须：
   a. have completed the required number of freefall skydives or accumulated the required amount of freefall time
      完成所需的自由落体跳伞次数或累积所需的自由落体时间
   b. have made each jump being presented as qualification in compliance with the USPA BSRs
      用于证明满足奖项申请资格的跳伞活动应符合 USPA 基本安全要求
   c. be a current USPA member at the time of application for the award
      在申请奖项时，USPA 会员身份在有效期内
   d. be the holder of a current USPA C license or its accepted foreign equivalent
      持有有效期内的 USPA C 执照或受到认可的外国同等级别执照
   e. have no record of a BSR violation on file with USPA
      在 USPA 档案中没有违反基本安全要求的记录
   f. have met the requirements of the previous award
      已达到上一个奖项的要求
2. Logging:「日志要求」
   a. The applicant must present logbook evidence of the required number of freefall skydives or amount of freefall time for which the award is being made.
      申请人必须提供日志，以证明所要求的自由落体跳伞次数或自由落体时间的真实性。
   b. For jumps made after December 31, 1987, each jump must be listed as a separate entry and contain at least:
      对于 1987 年 12 月 31 日之后进行的跳伞，每次跳伞都必须单独列出记录，并且至少包含以下信息：
      (1) the jump number「跳伞次数」
      (2) date「日期」
      (3) location「地点」
      (4) exit altitude「出舱高度」
      (5) freefall length「自由落体的时间」
      (6) type of jump (formation skydiving, accuracy, jumpmaster, photography, etc.)
          跳伞类型（编队跳伞、精准度跳伞、跳伞指导、摄影等）

(7) signatures of witnessing jumpers or pilots(encouraged but not required)
见证此次跳伞的跳伞者的签名，或飞行员的签名（鼓励但不要求）

3. Verification of the required number of freefall skydives or freefall time and other requirements will be made by:
下列人员核实所需的自由落体跳伞次数或自由落体时间及其他要求：
   a. a USPA Regional or National Director
   USPA 区域经理或全国经理
   b. a USPA administrative officer
   USPA 行政人员
   c. in case of hardship or extraordinary conditions, other persons deemed acceptable to USPA Headquarters or the USPA Board of Directors
   如有困难或特殊情况：其他 USPA 总部或 USPA 董事会可接受的人员
4. The verifying official will submit to USPA Headquarters a completed application verifying that the applicant has met all requirements.
审核者将向 USPA 总部提交一份完整的申请，确认申请人符合所有要求。
5. Upon receipt of the completed application, USPA Headquarters will issue the award as directed by the verifying official.
USPA 总部收到完整的申请后，将根据审核者的指示颁发奖项。
6. All awards will be issued by USPA Headquarters in the order the qualified application is received.
所有奖项将由 USPA 总部按照收到合格申请的先后顺序颁发。
7. In the case of special circumstances or hardships, waiver of these requirements and procedures may be applied for through the USPA Board of Directors.
在特殊情况或困难情况下，可以向 USPA 董事会申请对某些要求或程序进行豁免。

D. PRESENTATION「颁奖」

1. Because of the particular significance of the milestone represented by the award of Expert Wings and Freefall Badges, it is in the best interest of the United States Parachute Association and the sport of skydiving that these awards be presented to the recipient with appropriate ceremony and recognition.
由于专家之翼奖和自由落体徽章所代表的里程碑式的特殊意义，为了 USPA 和跳伞运动的利益，这些奖项应通过适当的仪式和认可颁发给获奖者。
2. Except when not practical, these awards should be presented by a USPA National or Regional Director, to whom the award will normally be entrusted before presentation.
除特殊情况外，这些奖项应由 USPA 全国或区域经理颁发，奖项通常在颁发之前委托给颁奖者。
3. It is also recommended and urged that all recipients of Expert Wings and Badges be publicized as widely as possible through skydiving publications and local news media.
委员会还建议并敦促通过跳伞杂志和当地新闻媒体尽可能广泛地宣传所有获得专家之翼奖和自由落体徽章的获奖者。
4. Whenever possible, a brief report and photograph of the presentation should be emailed to communications@uspa. org or mailed to:
应尽可能将一份简短的报告和颁奖照片通过电子邮件发送到 communications@uspa.org，或邮寄至：

Editor「主编」
Parachutist「跳伞者杂志」
5401 Southpoint Centre Blvd. Fredericksburg, VA 22407
地址：USPA, 5401 Southpoint Centre Blvd. Fredericksburg, Virginia，邮编：22407

8-3 能力表现奖 Performance Awards

A. AWARDS FOR SKYDIVING SKILL「为跳伞技能而设的奖项」

The performance awards program is an international awards program of the United States Parachute Association.
能力表现奖是 USPA 设立的一个国际奖项。

1. Canopy formation performance awards「降落伞编队奖」
   a. These awards recognize each applicant's progression towards higher levels of canopy control, maneuverability, and proficiency.
      这些奖项认可申请者在更高水平的伞控、机动性和熟练程度上的提高。
   b. In receiving and exhibiting these awards, the recipient agrees to exercise good judgment and wisdom in promoting safe canopy relative work among his or her peers, among those less experienced than himself or herself, and toward observers of the sport.
      接受和展示这些奖项，表明获奖者愿意运用良好的判断力和智慧，在其同伴、经验不及自身的人，以观看这项运动的人中，推动促进降落伞编队运动的安全发展。

B. PREREQUISITES「前提条件」

1. Each applicant must be either a current USPA member or a member of another FAI Aero Club.
   申请人必须是 USPA 会员或其他 FAI 航空俱乐部的会员，且会籍在有效期内。
2. Jumps used to qualify for these awards are to comply with the USPA Basic Safety Requirements.
   用于作为满足这些奖项资格的证明的跳伞活动应该符合 USPA 基本安全要求。

C. CANOPY AWARD CATEGORIES「降落伞编队奖项的种类」

1. The 4-Stack Award is available for building a canopy formation of four or more canopies.
   四伞堆叠式（Stack）编队奖适用于成功建立由 4 个或更多个降落伞组成的降落伞编队。
2. The CCR (Canopy Crest Recipient) or 8-Stack Award is available for building a canopy formation of eight or more canopies.
   CCR（编队徽章奖）或八伞堆叠式编队奖适用于成功建立由 8 个或更多个降落伞组成的降落伞编队。
3. The CCS (Canopy Crest Solo) Award is available for entering eighth or later in a complete eight-canopy or larger formation.
   CCS（编队徽章个人奖）适用于成功作为第 8 位（或更后面）加入八伞编队或更大的编队中的人。
4. Night versions of each of these awards are available for those who have completed these formations at night.
   这些奖项的夜间版适用于那些在夜间完成这些编队的跳伞者。

D. QUALIFICATIONS「资格」

1. The formations completed for this award may come from the USPA Skydiver's Competition Manual or may be other recognizable formations.
   为获得奖项而完成的编队可以参考自 USPA 的跳伞者比赛手册，也可以是其他受到认可的编队队形。
2. All formations must be planned in advance.
   所有编队都必须是事先做好计划的。
3. All participants must be in position and on grips for the formation to be considered complete.
   所有参赛者必须在正确的位置上且连接好，才能被认为是完整的编队。
   （译者注：Grip 在这里译为连接，指用手抓住 A 线或前组，或者用脚的特定部位接触 A 线，详见跳伞者比赛手册（SCM）第 10 章）
4. The completed formation must be held for a minimum of ten seconds.
   成功完成的编队必须保持至少 10 秒。

E. APPLICATION「申请程序」

Send the completed application to:
把填妥的申请表格寄往：
USPA Headquarters——5401 Southpoint Centre Blvd. Fredericksburg, VA 22407 or fax to(540) 604-9741 and include:
USPA 总部—地址：USPA, 5401 Southpoint Centre Blvd. Fredericksburg, VA，邮编：22407，或传真至（540）604-9741，内容包括：

1. the applicant's name as it is to appear on official certificates
   申请人的名字（将出现在正式证书上）
2. the location of the jump: city, state, country (if not USA)
   跳伞地点：城市、州，以及国家（如果不是美国）
3. diagram or name of each completed formation
   每个成功完成的降落伞编队的形状或名称
4. a list of the other participants (signatures not required)
   其他参与者的名单（无需签名）
5. the date of the jump that qualified the applicant for the award
   用于作为申请该奖项资格的证明的跳伞活动的日期
6. the holding time for the formation
   降落伞编队的保持时间
7. the award applied for
   申请的具体奖项
8. the appropriate fee for the award and any additional materials requested, such as decals, pins, or additional certificates
   奖项的申请费用，以及对任何周边的申请，如贴纸、别针或额外的证书

8-4 资深会员证书 Membership Tenure Certificates

A. TENURE AWARDS「资深会员奖」

1. Membership tenure certificates are issued to acknowledge support of skydiving through membership in USPA for significant periods of time.
   资深会员证书的颁发是为了感谢获得者长期以来作为 USPA 会员对跳伞运动的支持。
2. USPA membership tenure certificates are issued at the completion of ten years of accumulated membership and at each five years thereafter.
   USPA 资深会员证书会在 USPA 会员会籍达到 10 年的时候颁发，之后每 5 年颁发一次。

B. QUALIFICATIONS「资格」

1. Computation of tenure:
   时间的计算：
   a. The ten-year certificate is issued when a full ten years of membership has been accumulated.
      十年资深会员证书是在累积了 10 年整的会员资格后颁发的。
   b. In other words, the certificate is issued at the end of the tenth year of membership.
      也就是说，证书是在会员会籍第 10 年末时颁发的。
   c. Lapses in membership are subtracted from the total time of membership.
      会籍中断的时间从会籍总时间中减去。
2. Certificates are issued upon request either by submitting the information online through the USPA website, or by contacting the membership department at USPA Headquarters.
   证书可以通过在 USPA 网站在线提交信息进行申请来获得，也可以联系 USPA 总部的会员部门。

8-5 运动精神奖 Sportsmanship Award

A. TED STRONG AWARD FOR EXTRAORDINARY SPORTSMANSHIP「Ted Strong 运动精神奖」

1. Established in 2012 to honor extraordinary sportsmanship displayed by teams or individuals at a USPA National Championships.
   该奖项于 2012 年设立，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。
2. Description of and criteria for this award are in the Skydiver's Competition Manual.
   该奖项的介绍和标准请参见跳伞者比赛手册。

B. RECIPIENTS OF THE TED STRONG AWARD FOR EXTRAORDINARY SPORTSMANSHIP「Ted Strong 运动精神奖获得者名单」

2012 Jarrett Martin, D-28900

2014 Team "Spaceland Lite 8"

2018 John "Jack" Berke, D-5195

第九章 联邦航空局文件

FAA Documents

SECTION SUMMARY「章节摘要」

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 and by relying upon the self-regulation of the participants through the guidelines and recommendations published by USPA.
美国交通部下属的联邦航空局负责管理美国的空域使用。在跳伞活动方面，联邦航空局通过以下方式履行职责：具体规定跳伞活动的某些事项，并依靠参与者根据 USPA 发布指导方针和建议进行自我管理。

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 certificating 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.
联邦航空局的主要职责是保障空中交通安全以及地面人员和财产安全。联邦航空局通过对飞行员、机械师、空中交通管制员和降落伞装备师（Riggers）进行认证，以及审批飞机和降落伞的数据来实现职责。该机构有权处以罚款，并暂停或撤销其签发的证书。在违反跳伞规定的情况下，联邦航空局可以对飞行员、装备师和跳伞者处以罚款，并暂停或吊销飞行员和装备师的证书。

The FAA relies upon self policing from within the skydiving community for most training and operational requirements.
联邦航空局依靠跳伞社区内部的自我监督来满足大多数训练和操作要求。

IMPORTANT REFERENCE NUMBERS 重要参考内容指引

- FAR Part 61(excerpts), pilot certification
  FAR 第 61 部分（摘录），飞行员认证
- FAR Part 65(excerpts), parachute riggers
  FAR 第 65 部分（摘录），降落伞装备师（Riggers）
- FAR 91(excerpts), general flight rules pertaining to skydiving operations
  FAR 第 91 部分（摘录），与跳伞作业有关的一般飞行规则
- FAR Part 105(all), skydiving
  FAR 第 105 部分（全部），跳伞
- FAR Part 119(excerpts), limits of jump flights
  FAR 第 119 部分（摘录），跳伞航次的限制
- AC 90-66B, multi-users at uncontrolled airports
  AC 90-66B，非管制机场的多方使用者
- AC 105-2E, sport parachuting
  AC 105-2E，跳伞运动
- FAA Air Traffic Bulletins, information for air traffic controllers
  联邦航空局空中交通公告，空中交通管制员信息

WHO NEEDS THIS SECTION?「谁需要这部分」

- jumpers studying for licenses and ratings
  为执照和评级进行学习的跳伞者
- jumpers planning exhibition jumps or jumps off the regular DZ
  计划进行跳伞表演或在常规的降落区外跳伞的跳伞者
- parachute riggers and packers
  降落伞装备师和叠伞员
- jump pilots
  跳伞作业飞机的飞行员
- drop zone management
  降落区的管理

9-1 联邦航空条例 Federal Aviation Regulations

译者注：联邦航空条例（FAR）各规定之间相互引用时，本译文采用了以下翻译：
按层次由高到低分别为“章 - Chapter”，“部分 - Part”，“节 – Section/Sec.”，“款 - Paragraph”

SUBCHAPTER D—AIRMEN「分章 D—航空人员」

PART 61—CERTIFICATION: PILOTS, FLIGHT INSTRUCTORS, AND GROUND INSTRUCTORS
「认证：飞行员、飞行教官、地面教官」

SEC. 61.1: APPLICABILITY AND DEFINITIONS「适用性和定义」

(a) This part prescribes:
本部分规定：

(1) The requirements for issuing pilot, flight instructor, and ground instructor certificates and ratings; the conditions under which those certificates and ratings are necessary; and the privileges and limitations of those certificates and ratings.
签发飞行员、飞行教官和地面教官证书和等级（Rating，是证书内容的一部分，说明证书的使用条件、特权和限制）的要求；这些证书和等级的必要条件；以及这些证书和等级的特权和限制。

(2) The requirements for issuing pilot, flight instructor, and ground instructor authorizations; the conditions under which those authorizations are necessary; and the privileges and limitations of those authorizations.
签发飞行员、飞行教官和地面教官授权的要求；这些授权的必要条件；以及这些授权的特权和限制。

(3) The requirements for issuing pilot, flight instructor, and ground instructor certificates and ratings for persons who have taken courses approved by the Administrator under other parts of this chapter.
根据本章其他部分，对已参加管理局批准课程的人员签发飞行员、飞行教官和地面教官证书和等级的要求。

SEC. 61.3: REQUIREMENT FOR CERTIFICATES, RATINGS, AND AUTHORIZATIONS「证书、等级和授权的要求」

(a) Required pilot certificate for operating a civil aircraft of the United States. No person may serve as a required pilot flight crewmember of a civil aircraft of the United States, unless that person:
操作美国民用飞行器所需的飞行员证书。任何人不得担任美国民用飞行器所规定的必要机组人员，除非：

(1) Has in the person's physical possession or readily accessible in the aircraft when exercising the privileges of that pilot certificate or authorization—
在行使相应飞行员证书或授权的特权时，该人持有，或在该飞行器上随时可提供—

(i) A pilot certificate issued under this part and in accordance with § 61.19;
根据第 61.19 条和本部分规定签发的飞行员证书；

(2) Has a photo identification that is in that person's physical possession or readily accessible in the aircraft when exercising the privileges of that pilot certificate or authorization.
在行使该飞行员证书或授权的特权时，该人持有，或在该飞行器上随时可提供带照片的身份证明。

(c) Medical certificate「健康证明」

(1) A person may serve as a required pilot flight crewmember of an aircraft only if that person holds the appropriate medical certificate issued under part 67 of this chapter, or other documentation acceptable to the FAA, that is in that person's physical possession or readily accessible in the aircraft.
任何人，只有持有根据本章第 67 部分规定签发的适当的健康证明或联邦航空局可接受的其他文件，并且该证明是该人实际持有的或在飞行器上随时可提供的时候，才能担任飞行器上的必要机组人员。

(i) Inspection of certificate. Each person who holds an airman certificate, medical certificate, authorization or license required by this part must present it and their photo identification as described in paragraph(a)(2) of this section for inspection upon a request from:

证书检查。持有本部分规定要求的航空人员证书、健康证明、授权书或执照的个人，在受到下列人士要求的时候，必须出示本节（a）（2）款所述的证书及照片身份证明，以供检查：

(1) The Administrator;
管理局授权人员；

(2) An authorized representative of the National Transportation Safety Board;
国家运输安全委员会的授权代表；

(3) Any Federal, State, or local law enforcement officer; or
任何联邦、州或地方执法官员；或

(4) An authorized representative of the Transportation Security Administration.
交通安全管理局的授权代表。

SEC. 61.23: MEDICAL CERTIFICATES: REQUIREMENT「健康证明：要求」

(a) Operations requiring a medical certificate.
需要健康证明的活动。

(2) Must hold at least a second class medical certificate when exercising:
在行使以下权利时必须至少持有二级健康证明：

(ii) Privileges of a commercial pilot certificate;
商业飞行员证书的特权；

If you hold **如果你持有**	**And on the date of examination for your most recent medical certificate you were** **且你最近一次体检时年龄为**	**And you are conducting an operation requiring** **而你正在进行一项需要以下执照证明的活动**	**Then your medical certificate expires, for that operation, at the end of the last day of the** **那么对于该活动** **你的健康证明有效期为**
(1) A first-class medical certificate 一级健康证明	(i) Under age 40 40 岁以下	an airline transport pilot certificate for pilot-in-command privileges, or for second-in-command privileges in a flag or supplemental operation in part 121 requiring three or more pilots 行使机长特权的航线运输飞行员证书，或在 121 节要求三个或更多飞行员的跨国或雇佣航班中行使副驾驶特权的航线运输飞行员证书	12th month after the month of the date of examination shown on the medical certificate 健康证明上显示的检查月份的后 12 个月
	(ii) Age 40 or older 40 岁或以上	an airline transport pilot certificate for pilot-in-command privileges, for second-in-command privileges in a flag or supplemental operation in part 121 requiring three or more pilots, or for a pilot flightcrew member in part 121 operations who has reached his or her 60th birthday 行使机长特权的航线运输飞行员证书，或在 121 节要求三个或更多飞行员的跨国或雇佣航班中行使副驾驶特权的航线运输飞行员证书，或进行 121 节所述的航班的达到 60 岁生日的飞行机组成员的航线运输飞行员证书	6th month after the month of the date of examination shown on the medical certificate 健康证明上显示的检查月份的后 6 个月
	(iii) Any age 任何年龄	a commercial pilot certificate or an air traffic control tower operator certificate 商业飞行员证书或空中交通管制塔操作员证书	12th month after the month of the date of examination shown on the medical certificate 健康证明上显示的检查月份的后 12 个月

If you hold 如果你持有	And on the date of examination for your most recent medical certificate you were 且你最近一次体检时年龄为	And you are conducting an operation requiring 而你正在进行一项需要以下执照证明的活动	Then your medical certificate expires, for that operation, at the end of the last day of the 那么对于该活动 你的健康证明有效期为
	(iv) Under age 40 40 岁以下	a recreational pilot certificate, a private pilot certificate, a flight instructor certificate (when acting as pilot in command or a required pilot flight crewmember in operations other than glider or balloon), a student pilot certificate, or a sport pilot certificate (when not using a U.S. driver's license as medical qualification) 娱乐「recreational」飞行员证书、私人飞行员证书、飞行教官证书（当担任机长或必须的飞行机组人员时，滑翔机或气球除外）、学生飞行员证书或运动飞行员证书（当不使用美国驾照作为医疗资格时）	60th month after the month of the date of examination shown on the medical certificate 健康证明上显示的检查月份的后 60 个月
	(v) Age 40 or older 40 岁或以上	a recreational pilot certificate, a private pilot certificate, a flight instructor certificate (when acting as pilot in command or a required pilot flight crewmember in operations other than glider or balloon), a student pilot certificate, or a sport pilot certificate (when not using a U.S. driver's license as medical qualification) 娱乐「recreational」飞行员证书、私人飞行员证书、飞行教官证书（当担任机长或必须的飞行机组人员时，滑翔机或气球除外）、学生飞行员证书或运动飞行员证书（当不使用美国驾照作为医疗资格时）	24th month after the month of the date of examination shown on the medical certificate 健康证明上显示的检查月份的后 24 个月
(2) A second-class medical certificate 二级健康证明	(i) Any age 任何年龄	"an airline transport pilot certificate for second-in-command privileges (other than the operations specified in paragraph (d)(1) of this section), a commercial pilot certificate, or an air traffic control tower operator certificate" 行使副驾驶特权的货运飞行员证书（本节（d）（1）款所指明的操作除外）、商业飞行员证书或航空交通管制塔台操作员证书	12th month after the month of the date of examination shown on the medical certificate 健康证明上显示的检查月份的后 12 个月
	(ii) Under age 40 40 岁以下	a recreational pilot certificate, a private pilot certificate, a flight instructor certificate (when acting as pilot in command or a required pilot flight crewmember in operations other than glider or balloon), a student pilot certificate, or a sport pilot certificate (when not using a U.S. driver's license as medical qualification) 娱乐「recreational」飞行员证书、私人飞行员证书、飞行教官证书（当担任机长或必须的飞行机组人员时，滑翔机或气球除外）、学生飞行员证书或运动飞行员证书（当不使用美国驾照作为医疗资格时）	60th month after the month of the date of examination shown on the medical certificate 健康证明上显示的检查月份的后 60 个月
	(iii) Age 40 or older 40 岁或以上	a recreational pilot certificate, a private pilot certificate, a flight instructor certificate (when acting as pilot in command or a required pilot flight crewmember in operations other than glider or balloon), a student pilot certificate, or a sport pilot certificate (when not using a U.S. driver's license as medical qualification) 娱乐「recreational」飞行员证书、私人飞行员证书、飞行教官证书（当担任机长或必须的飞行机组人员时，滑翔机或气球除外）、学生飞行员证书或运动飞行员证书（当不使用美国驾照作为医疗资格时）	24th month after the month of the date of examination shown on the medical certificate 健康证明上显示的检查月份的后 24 个月

If you hold 如果你持有	And on the date of examination for your most recent medical certificate you were 且你最近一次体检时年龄为	And you are conducting an operation requiring 而你正在进行一项需要以下执照证明的活动	Then your medical certificate expires, for that operation, at the end of the last day of the 那么对于该活动 你的健康证明有效期为
(3) A third-class medical certificate 三级健康证明	(i) Under age 40 40 岁以下	a recreational pilot certificate, a private pilot certificate, a flight instructor certificate (when acting as pilot in command or a required pilot flight crewmember in operations other than glider or balloon), a student pilot certificate, or a sport pilot certificate (when not using a U.S. driver's license as medical qualification) 娱乐「recreational」飞行员证书、私人飞行员证书、飞行教官证书（当担任机长或必须的飞行机组人员时，滑翔机或气球除外）、学生飞行员证书或运动飞行员证书（当不使用美国驾照作为医疗资格时）	60th month after the month of the date of examination shown on the medical certificate 健康证明上显示的检查月份的后 60 个月
	(ii) Age 40 or older 40 岁或以上	a recreational pilot certificate, a private pilot certificate, a flight instructor certificate (when acting as pilot in command or a required pilot flight crewmember in operations other than glider or balloon), a student pilot certificate, or a sport pilot certificate (when not using a U.S. driver's license as medical qualification) 娱乐「recreational」飞行员证书、私人飞行员证书、飞行教官证书（当担任机长或必须的飞行机组人员时，滑翔机或气球除外）、学生飞行员证书或运动飞行员证书（当不使用美国驾照作为医疗资格时）	24th month after the month of the date of examination shown on the medical certificate 健康证明上显示的检查月份的后 24 个月

SEC. 61.51: PILOT LOGBOOKS「飞行日志」

(i) Presentation of required documents.
提交所需文件。

(1) Persons must present their pilot certificate, medical certificate, logbook, or any other record required by this part for inspection upon a reasonable request by—
在下列人员提出合理要求时，必须出示飞行员证书、健康证明、日志或本部分所规定的任何其他记录，以供查阅—

(i) The Administrator;
管理局授权人员；

(ii) An authorized representative from the National Transportation Safety Board; or
国家运输安全委员会的授权代表；或

(iii) Any Federal, State, or local law enforcement officer.
任何联邦、州或地方执法官员。

SEC. 61.56: FLIGHT REVIEW「飞行审查」

(c) Except as provided in paragraphs(d),(e), and(g) of this section, no person may act as pilot in command of an aircraft unless, since the beginning of the 24th calendar month before the month in which that pilot acts as pilot in command, that person has—
除本节（d）、（e）及（g）款所规定外，任何人不得担任飞行器机长，除非该名飞行员自开始担任机长的月份的 24 个月前的月初起，已经—

(1) Accomplished a flight review given in an aircraft for which that pilot is rated by an authorized instructor and
完成由获得授权的教官对该飞行员进行的飞行审查，审查是在该飞行员获得相应等级的飞行器上进行，且

(2) A logbook endorsed from an authorized instructor who gave the review certifying that the person has satisfactorily completed the review.

拥有经授权的教官签署的日志，证明该飞行员已圆满完成了审查。

SEC. 61.57: RECENT FLIGHT EXPERIENCE: PILOT IN COMMAND「近期飞行经验：机长」

(a) General experience「一般经验」

(1) Except as provided in paragraph(e) of this section, no person may act as a pilot in command of an aircraft carrying passengers or of an aircraft certificated for more than one pilot flight crewmember unless that person has made at least three takeoffs and three landings within the preceding 90 days, and—
除本节（e）款规定外，任何人不得担任载有乘客的飞行器机长或经批准可有一名以上飞行机组人员的飞行器机长，除非该人在过去 90 天内至少进行了三次起飞和三次降落，且—

(i) The person acted as the sole manipulator of the flight controls; and
该人是唯一操纵飞行器的人；以及

(ii) The required takeoffs and landings were performed in an aircraft of the same category, class, and type (if a type rating is required), and, if the aircraft to be flown is an airplane with a tailwheel, the takeoffs and landings must have been made to a full stop in an airplane with a tailwheel.
所要求的起飞和降落是在同一一级分类（Category）、二级分类（Class）和型号（Type）的飞行器上进行的（如果该型号飞行器的证书等级是必须的），并且，如果要驾驶的飞行器带尾轮，则飞行器在降落和起飞之间必须要有完全停止的阶段。

SEC. 61.133: COMMERCIAL PILOT PRIVILEGES AND LIMITATIONS「商业飞行员的特权和限制」

(a) Privileges—「特权」

(1) General. A person who holds a commercial pilot certificate may act as pilot in command of an aircraft—
一般。持有商用飞行员证书的人士可在以下情况担任机长—

(i) Carrying persons or property for compensation or hire, provided the person is qualified in accordance with this part and with the applicable parts of this chapter that apply to the operation; and
运输人员或财产以赚取报酬或租金，前提是该人士符合本部分规定和本章适用于该次飞行的部分的规定；以及

(ii) For compensation or hire, provided the person is qualified in accordance with this part and with the applicable parts of this chapter that apply to the operation.
为了赚取报酬或租金，前提是该人士须符合本部分规定及本章适用于该次飞行的部分的规定。

PART 65—CERTIFICATION: AIRMEN OTHER THAN FLIGHT CREW MEMBERS
「认证：机组人员以外的航空人员」

SEC. 65.1: APPLICABILITY「适用性」

This part prescribes the requirements for issuing the following certificates and associated ratings and the general operating rules for the holders of those certificates and ratings:
本部分规定了签发下列证书和相关等级的要求，以及这些证书和等级持有人的一般操作规则：

(a) Air-traffic control-tower operators.「空中交通管制员」

(b) Aircraft dispatchers.「飞机调度员」

(c) Mechanics.「机械师」

(d) Repairmen.「机修工」

(e) Parachute riggers.「降落伞装备师」

SEC. 65.11: APPLICATION AND ISSUE「申请和签发」

(a) Application for a certificate and appropriate class rating, or for an additional rating, under this part must be made on a form and in a manner prescribed by the Administrator. Each person who applies for airmen certification services to be administered outside the United States or for any certificate or rating issued under this part must

show evidence that the fee prescribed in appendix A of part 187 of this chapter has been paid.
根据本部分规定申请证书及适当的 Class（飞行器二级分类）等级评定，或申请额外的等级评定，必须以管理局规定的表格及方式提出。凡申请在美国境外管理的航空人员认证服务，或申请根据本部分规定签发的任何证书或等级的人员，必须证明已支付本章 187 部分附录 A 中规定的费用。

(b) An applicant who meets the requirements of this part is entitled to an appropriate certificate and rating.
符合本部分要求的申请人有权获得适当的证书和等级。

(c) Unless authorized by the Administrator, a person whose air traffic control tower operator, mechanic, or parachute rigger certificate is suspended may not apply for any rating to be added to that certificate during the period of suspension.
除非获管理局授权，否则任何空中交通管制员、机修工或降落伞装备师在其证书被暂时吊销期间，不得申请在证书上添加任何等级评定。

(d) Unless the order of revocation provides otherwise—
除非吊销指令内另有规定—

(1) A person whose air traffic control tower operator, aircraft dispatcher, or parachute rigger certificate is revoked may not apply for the same kind of certificate for 1 year after the date of revocation; and
被吊销空中交通管制员、飞机调度员、降落伞装备师证书的人员，自吊销之日起 1 年内不得申请同一类证书

(2) A person whose mechanic or repairman certificate is revoked may not apply for either of those kinds of certificates for 1 year after the date of revocation.
被吊销机械师或修理工证书的，自吊销之日起 1 年内不得申领两者中的任何一种证书。

SEC. 65.12: OFFENSES INVOLVING ALCOHOL OR DRUGS「涉及酒精或毒品的犯罪」

(a) A conviction for the violation of any Federal or state statute relating to the growing, processing, manufacture, sale, disposition, possession, transportation, or importation of narcotic drugs, marihuana, or depressant or stimulant drugs or substances is grounds for
因违反任何有关种植、加工、制造、销售、处置、拥有、运输或进口麻醉药品、大麻、镇静剂或兴奋剂的联邦或州法规而被定罪，可导致以下后果：

(1) Denial of an application for any certificate or rating issued under this part for a period of up to 1 year after the date of final conviction; or
在最终定罪日期后的 1 年内，驳回申请人根据本部分规定提出的证书或等级的申请；或

(2) Suspension or revocation of any certificate or rating issued under this part.
暂停或吊销根据本部分规定签发的任何证书或等级。

(b) The commission of an act prohibited by § 91.19(a) of this chapter is grounds for—
犯下本章 91.19（a）所禁止的行为可导致以下后果：

(1) Denial of an application for a certificate or rating issued under this part for a period of up to 1 year after the date of that act; or
自犯罪日起最长一年内，驳回根据本部分规定提出的证书或等级的申请；或

(2) Suspension or revocation of any certificate or rating issued under this part.
暂停或吊销根据本部分规定签发的任何证书或等级。

SEC. 65.15: DURATION OF CERTIFICATES「证书期限」

(a) Except for repairman certificates, a certificate or rating issued under this part is effective until it is surrendered, suspended, or revoked.
除机修工证书外，根据本部分规定签发的证书或等级评级在被放弃、暂停或撤销之前有效。

(b) Unless it is sooner surrendered, suspended, or revoked, a repairman certificate is effective until the holder is relieved from the duties for which the holder was employed and certificated.
除非机修工证书被放弃、暂停或吊销，否则该证书将一直有效，直到持证人解除其雇佣关系和免去证书相关职责为止。

(c) The holder of a certificate issued under this part that is suspended, revoked, or no longer effective shall return it to the Administrator.
根据本部分规定签发的证书如被暂停、撤销或失效，其持有人须将该证书交还管理局。

(d) Except for temporary certificates issued under § 65.13, the holder of a paper certificate issued under this part may not exercise the privileges of that certificate after March 31, 2013.
除根据 65.13 节签发的临时证书外，持有根据本部分规定签发的纸质证书的人在 2013 年 3 月 31 日后不得行使该证书的特权。

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」

(a) An application for a change of name on a certificate issued under this part must be accompanied by the applicant's current certificate and the marriage license, court order, or other document verifying the change. The documents are returned to the applicant after inspection.
根据本部分规定签发的证书上的姓名更改申请，必须附有申请人的现行证书及结婚证、法院命令或其他姓名更改的证明文件。这些文件经检查后会交还给申请人。

(b) An application for a replacement of a lost or destroyed certificate is made by letter to the Department of Transportation, Federal Aviation Administration, Airman Certification Branch, Post Office Box 25082, Oklahoma City, OK 73125. The letter must—
如需更换遗失或毁坏的证书，请写信至美国俄克拉何马州俄克拉荷马市邮政信箱 25082，邮编 OK 73125，美国交通运输部联邦航空局航空人员认证处。这封信必须—

(1) Contain the name in which the certificate was issued, the permanent mailing address(including zip code), social security number(if any), and date and place of birth of the certificate holder, and any available information regarding the grade, number, and date of issue of the certificate, and the ratings on it; and
包含证书上的持有人名称、长期邮寄地址（包括邮政编码）、社会保险号（如有）、证书持有人的出生日期和地点，以及证书等级、编号、签发日期和等级的任何可用信息；以及

(2) Be accompanied by a check or money order for $2, payable to the Federal Aviation Administration.
附上一张 2 美元的支票或汇票，收款方为联邦航空局。

(c) An application for a replacement of a lost or destroyed medical certificate is made by letter to the Department of Transportation, Federal Aviation Administration, Aerospace Medical Certification Division, Post Office Box 26200, Oklahoma City, OK 73125, accompanied by a check or money order for $2.00.
如需申请更换遗失或毁坏的健康证明，请写信至美国俄克拉何马州俄克拉荷马市邮政信箱 26200，邮编 OK 73125，美国交通运输部联邦航空局航太健康证明部处，并附上一张 2 美元的支票或汇票。

(d) A person whose certificate issued under this part or medical certificate, or both, has been lost may obtain a telegram from the FAA confirming that it was issued. The telegram may be carried as a certificate for a period not to exceed 60 days pending his receiving a duplicate certificate under paragraph(b) or(c) of this section, unless he has been notified that the certificate has been suspended or revoked. The request for such a telegram may be made by prepaid telegram, stating the date upon which a duplicate certificate was requested, or including the request for a duplicate and a money order for the necessary amount. The request for a telegraphic certificate should be sent to the office prescribed in paragraph(b) or(c) of this section, as appropriate. However, a request for both at the same time should be sent to the office prescribed in paragraph(b) of this section.
遗失根据本部分规定签发的证书或健康证明（或同时遗失两者）的人，可从联邦航空局获得一封确认证书已签发的电报。除非该人收到证书被暂停或吊销的通知，否则在其收到根据本节（b）或（c）款规定取得的证书副本之前，该电报可在 60 天内临时作为证书使用。对该电报的申请可以通过预付电报提出，并在其中说明申请证书副本的日期，或包含对副本的申请以及填写了必要金额的汇票。申请以电报作为临时证书的请求应视情况送交本节（b）或（c）款规定的办事处。但是，在同时遗失证书和健康证明的时候，应向本节（b）款规定的办事处提出这两项要求。

SEC. 65.17: TESTS: GENERAL PROCEDURE「考试：一般程序」

(a) Tests prescribed by or under this part are given at times and places, and by persons, designated by the Administrator.
管理局可指定时间、地点以及监考人员进行本部分规定的考试。

(b) The minimum passing grade for each test is 70 percent.
考试的最低及格分数为 70%。

SEC. 65.18: WRITTEN TESTS: CHEATING OR OTHER UNAUTHORIZED CONDUCT「笔试：作弊或其他未经授权的行为」

(a) Except as authorized by the Administrator, no person may—
除非经管理局授权，任何人不得

(1) Copy, or intentionally remove, a written test under this part;
复制或故意删除本部分规定的笔试内容；

(2) Give to another, or receive from another, any part or copy of that test;
交予他人或从他人那里获得该考试的任何部分或副本；

(3) Give help on that test to, or receive help on that test from, any person during the period that test is being given;
在考试期间向任何人提供帮助，或从任何人那里获得帮助；

(4) Take any part of that test in behalf of another person;
顶替他人参加该考试的任何部分；

(5) Use any material or aid during the period that test is being given; or
在考试期间使用任何参考材料或辅助；或

(6) Intentionally cause, assist, or participate in any act prohibited by this paragraph.
故意造成、协助或参与本款禁止的任何行为。

(b) No person who commits an act prohibited by paragraph(a) of this section is eligible for any airman or ground instructor certificate or rating under this chapter for a period of 1 year after the date of that act. In addition, the commission of that act is a basis for suspending or revoking any airman or ground instructor certificate or rating held by that person.
凡犯有本节（a）款所禁止的行为的人，在该行为发生之日起一年内无资格获得本章规定的航空人员或地面教官证书或等级。此外，违反这些规定可能导致该人持有的任何航空人员或地面教官证书或等级被暂停或吊销。

SEC. 65.19: RETESTING AFTER FAILURE「不合格者的重考」

An applicant for a written, oral, or practical test for a certificate and rating, or for an additional rating under this part, may apply for retesting—
参加证书和等级的笔试、口试或实操考试，或根据本部分规定申请附加等级的申请人，申请重新考试需符合以下条件—

(a) After 30 days after the date the applicant failed the test; or
申请人考试不及格的 30 天后；或

(b) Before the 30 days have expired if the applicant presents a signed statement from an airman holding the certificate and rating sought by the applicant, certifying that the airman has given the applicant additional instruction in each of the subjects failed and that the airman considers the applicant ready for retesting.
在 30 天期满前，如果申请人提交一份由持有申请人申请的证书和等级的航空人员签署的说明，证明该航空人员已就每项申请人未通过的科目给予申请人额外的指导，且该航空人员认为申请人已准备好重新考试。

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」

(a) No person may make or cause to be made—
任何人不得—

(1) Any fraudulent or intentionally false statement on any application for a certificate or rating under this part;
在根据本部分规定进行的任何证书或等级的申请中作出或替他人作出欺诈性的或故意造假的声明；
(2) Any fraudulent or intentionally false entry in any logbook, record, or report that is required to be kept, made, or used, to show compliance with any requirement for any certificate or rating under this part;
在按规定需要保留、记载或使用的日志、记录或报告中作出或替他人作出任何欺诈性的或故意造假的记录，以符合本部分规定对证书或等级的任何要求；
(3) Any reproduction, for fraudulent purpose, of any certificate or rating under this part; or
以欺诈为目的复制本部分规定下的任何证书或等级；或
(4) Any alteration of any certificate or rating under this part.
对本部分规定的任何证书或等级的进行任何更改。

(b) The commission by any person of an act prohibited under paragraph(a) of this section is a basis for suspending or revoking any airman or ground instructor certificate or rating held by that person.
任何人实施本节（a）款所禁止的行为，其持有的任何航空人员或地面教官证书或等级将可能被暂停或吊销。

SEC. 65.21: CHANGE OF ADDRESS「地址变更」

Within 30 days after any change in his permanent mailing address, the holder of a certificate issued under this part shall notify the Department of Transportation, Federal Aviation Administration, Airman Certification Branch, Post Office Box 25082, Oklahoma City, OK 73125, in writing, of his new address.
长期邮寄地址如有任何变更，根据本部分规定签发的证书的持有人应在 30 天内将其新地址以书面形式通知以下地址：美国俄克拉何马州俄克拉荷马市邮政信箱 25082，邮编 OK 73125，美国交通运输部联邦航空局航空人员认证处。

SEC. 65.111: CERTIFICATE REQUIRED「证书要求」

(a) No person may pack, maintain, or alter any personnel-carrying parachute intended for emergency use in connection with civil aircraft of the United States (including the reserve parachute of a dual parachute system to be used for intentional parachute jumping) unless that person holds an appropriate current certificate and type rating issued under this subpart and complies with § 65.127 through 65.133.
任何人不得对涉及美国民用飞行器的、供人员使用的应急降落伞（包括用于刻意跳伞的双降落伞系统中的备用降落伞）进行叠伞、维护、改装，除非该人持有根据本子部分规定签发的适当的有效期内证书和装备类型等级（Type Rating），并符合 § 65.127 至 65.133 节的规定。

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。

(b) No person may pack any main parachute of a dual-parachute system to be used for intentional parachute jumping in connection with civil aircraft of the United States unless that person—
任何人不得对涉及美国民用飞行器的、用于刻意跳伞的双降落伞系统中的主降落伞进行叠伞，除非该人—
(1) Has an appropriate current certificate issued under this subpart;
有根据本子部分规定签发的，适当的有效期内的证书；
(2) Is under the supervision of a current certificated parachute rigger;
受到持有有效期内证书的降落伞装备师（Rigger）的监督；
(3) Is the person making the next parachute jump with that parachute in accordance with § 105.43(a) of this chapter; or
是使用该降落伞进行下一次跳伞的人并且符合本章 105.43（a）的规定；或
(4) Is the parachutist in command making the next parachute jump with that parachute in a tandem parachute operation conducted under § 105.45(b)(1) of this chapter.

是根据本章 105.45（b）（1）的规定，用该降落伞进行双人伞跳伞的双人伞指挥员。

(c) No person may maintain or alter any main parachute of a dual-parachute system to be used for intentional parachute jumping in connection with civil aircraft of the United States unless that person—
任何人不得对涉及美国民用飞行器的、用于刻意跳伞的双降落伞系统中的主降落伞进行维护或改装，除非该人—

(1) Has an appropriate current certificate issued under this subpart; or
有根据本子部分规定签发的适当的有效期内证书；或

(2) Is under the supervision of a current certificated parachute rigger;
受到持有有效期内证书的降落伞装备师（Rigger）的监督；

(d) Each person who holds a parachute rigger certificate shall present it for inspection upon the request of the Administrator or an authorized representative of the National Transportation Safety Board, or of any Federal, State, or local law enforcement officer.
持有降落伞装备师证书的人应在受到管理局或国家运输安全委员会或任何联邦、州或地方执法官员的授权代表的要求时，出示降落伞装备师证书以供检查。

(e) The following parachute rigger certificates are issued under this part:
以下降落伞装备师证书是根据本部分规定发出的：

(1) Senior parachute rigger
资深降落伞装备师

(2) Master parachute rigger
高级降落伞装备师

(f) Sections 65.127 through 65.133 do not apply to parachutes packed, maintained, or altered for the use of the armed forces.
第 65.127 至 65.133 节不适用于军用降落伞的叠伞、维护或改装。

SEC. 65.113: ELIGIBILITY REQUIREMENTS: GENERAL「资格要求：概述」

(a) To be eligible for a parachute rigger certificate, a person must—
要获得降落伞装备师证书，申请人必须—

(1) Be at least 18 years of age;
年满 18 周岁；

(2) Be able to read, write, speak, and understand the English language, or, in the case of a citizen of Puerto Rico, or a person who is employed outside of the United States by a U.S. air carrier, and who does not meet this requirement, be issued a certificate that is valid only in Puerto Rico or while he is employed outside of the United States by that air carrier, as the case may be; and
能够读、写、说和理解英语。或者如果是波多黎各公民，可获发只在波多黎各有效的证书。或者如果是在美国境外受雇于美国航空公司的不符合此语言要求的人，可获发在他（她）于美国境外受雇于此航空公司期间有效的证书；并且

(3) Comply with the sections of this subpart that apply to the certificate and type rating he seeks.
须遵守本子部分规定中适用于其证书要求和装备类型等级的章节。

(b) Except for a master parachute rigger certificate, a parachute rigger certificate that was issued before, and was valid on, October 31, 1962, is equal to a senior parachute rigger certificate, and may be exchanged for such a corresponding certificate.
除高级降落伞装备师证书外，在 1962 年 10 月 31 日前签发并有效的降落伞装备师证书等同于资深降落伞装备师证书，并可转换成资深降落伞装备师证书。

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」

Except as provided in § 65.117, an applicant for a senior parachute rigger certificate must—

除第 65.117 条规定外，资深降落伞装备师证书的申请人必须—

(a) Present evidence satisfactory to the Administrator that he has packed at least 20 parachutes of each type for which he seeks a rating, in accordance with the manufacturer's instructions and under the supervision of a certificated parachute rigger holding a rating for that type or a person holding an appropriate military rating;
向管理局提交能令其满意的证据，显示他对所申请的不同类型的降落伞都进行了至少 20 次叠伞，叠伞符合相应制造商的指示，且受到持有该类型降落伞装备师等级的装备师或持有适当军事等级的人监督；

(b) Pass a written test, with respect to parachutes in common use, on—
通过一个与常用降落伞有关的笔试，笔试内容包括—

(1) Their construction, packing, and maintenance;
降落伞的构造、叠伞和维护；

(2) The manufacturer's instructions;
制造商说明书；

(3) The regulations of this subpart; and
本子部分的规定；以及

(c) Pass an oral and practical test showing his ability to pack and maintain at least one type of parachute in common use, appropriate to the type rating he seeks.
通过口试和实操测试，证明他有能力对至少一种类型的常用降落伞进行叠伞和维护，并适用于他申请的降落伞类型。

SEC. 65.117: MILITARY RIGGERS OR FORMER MILITARY RIGGERS:「军队降落伞装备师或原军队降落伞装备师」

In place of the procedure in § 65.115, an applicant for a senior parachute rigger certificate is entitled to it if he passes a written test on the regulations of this subpart and presents satisfactory documentary evidence that he—
资深降落伞装备师证书的申请人有权不按照 65.115 条规定的流程获得该证书，前提是他通过了本子部分规定的笔试，并能提交令人信服的相关证明文件，证明他—

(a) Is a member or civilian employee of an Armed Force of the United States, is a civilian employee of a regular armed force of a foreign country, or has, within the 12 months before he applies, been honorably discharged or released from any status covered by this paragraph;
是美军的成员或平民雇员，或是外国正规武装部队的平民雇员，或在申请的前 12 个月内体面地被解除或离开这些职位；

(b) Is serving, or has served within the 12 months before he applies, as a parachute rigger for such an Armed Force; and
正在或在他提出申请的前 12 个月内，担任美军的降落伞装备师；以及

(c) Has the experience required by § 65.115(a)
具有第 65.115（a）款要求的经验

SEC. 65.119: MASTER PARACHUTE RIGGER「高级降落伞装备师」

An applicant for a master parachute rigger certificate must meet the following requirements:
高级降落伞装备师证书的申请人必须满足以下要求：

(a) Present evidence satisfactory to the Administrator that he has had at least 3 years of experience as a parachute rigger and has satisfactorily packed at least 100 parachutes of each of two types in common use, in accordance with the manufacturer's instructions
提供令管理局满意的证据，证明他有至少 3 年的降落伞装备师经验，并已按相应制造商的说明，令人满意地对两种类型的常用降落伞至少各进行 100 次叠伞

(1) While a certificated and appropriately rated senior parachute rigger; or
且这是在其持有适当类型等级的资深降落伞装备师证书期间；或

(2) While under the supervision of a certificated and appropriately rated parachute rigger or a person holding appropriate military ratings.

是在持有适当类型等级的资深降落伞装备师证书的人，或持有适当军事等级的人的监督下进行的

An applicant may combine experience specified in paragraphs

申请人可整合

(a) (1) and (2) of this section to meet the requirements of this paragraph.

本节（1）和（2）所要求的经历经验，以符合本条要求。

(b) If the applicant is not the holder of a senior parachute rigger certificate, pass a written test, with respect to parachutes in common use, on—

如果申请人不是资深降落伞装备师证书的持有人，则应通过一个与常用降落伞有关的笔试，笔试内容包括—

(1) Their construction, packing, and maintenance;

降落伞的构造、叠伞和维护；

(2) The manufacturer's instructions; and

制造商说明书；以及

(3) The regulations of this subpart.

本子部分的规定。

(c) Pass an oral and practical test showing his ability to pack and maintain two types of parachutes in common use, appropriate to the type ratings he seeks.

通过口试和实操测试，证明他有能力对两种类型的常用降落伞进行叠伞和维护，并适用于他申请的降落伞类型。

SEC. 65.121: TYPE RATINGS「类型等级」

(a) The following type ratings are issued under this subpart:

以下类型等级（Type Rating）是根据本子部分内容签发：

(1) Seat「座椅式降落伞」

(2) Back「背包式降落伞」

(3) Chest「胸前式降落伞」

(4) Lap「前挂式降落伞」

(b) The holder of a senior parachute rigger certificate who qualifies for a master parachute rigger certificate is entitled to have placed on his master parachute rigger certificate the ratings that were on his senior parachute rigger certificate.

持有资深降落伞装备师证书的人士如符合高级降落伞装备师证书的资格，可在他的高级降落伞装备师证书上加上他的资深降落伞装备师证书上的等级。

SEC. 65.123: ADDITIONAL TYPE RATINGS: REQUIREMENTS「额外类型等级：要求」

A certificated parachute rigger who applies for an additional type rating must—

持证降落伞装备师如果申请额外的类型等级，必须—

(a) Present evidence satisfactory to the Administrator that he has packed at least 20 parachutes of the type for which he seeks a rating, in accordance with the manufacturer's instructions and under the supervision of a certificated parachute rigger holding a rating for that type or a person holding an appropriate military rating; and

向管理局提供令其满意的证据，证明他已按照制造商的说明，在持有该类型降落伞等级的装备师或持有适当军事等级的人的监督下，对所申请的类型的降落伞进行至少 20 次叠伞；以及

(b) Pass a practical test, to the satisfaction of the Administrator, showing his ability to pack and maintain the type of parachute for which he seeks a rating.

通过实操测试，向管理局证明他有能力对其申请的类型等级的降落伞进行叠伞和维护。

SEC. 65.125: CERTIFICATES: PRIVILEGES「证书：特权」

(a) A certificated senior parachute rigger may—

持证的资深降落伞装备师可以—

(1) Pack or maintain (except for major repair) any type of parachute for which he is rated; and

对任何符合他的类型等级的降落伞进行叠伞或维护（大修除外）；以及

(2) Supervise other persons in packing any type of parachute for which that person is rated in accordance with § 105.43(a) or § 105.45(b)(1) of this chapter.
根据本章 105.43（a）或 105.45（b）（1）款规定，监督他人对任何符合他的类型等级的降落伞进行叠伞。

(b) A certificated master parachute rigger may—
持证的高级降落伞装备师可以—

(1) Pack, maintain, or alter any type of parachute for which he is rated; and
对任何符合他的类型等级的降落伞进行叠伞、维护和改装；以及

(2) Supervise other persons in packing, maintaining, or altering any type of parachute for which the certificated parachute rigger is rated in accordance with § 105.43(a) or § 105.45(b)(1) of this chapter.
根据本章 105.43（a）或 105.45（b）（1）规定，监督他人对任何符合他的类型等级的降落伞进行叠伞和维护。

(c) A certificated parachute rigger need not comply with §§ 65.127 through 65.133 (relating to facilities, equipment, performance standards, records, recent experience, and seal) in packing, maintaining, or altering (if authorized) the main parachute of a dual parachute pack to be used for intentional jumping.
获得认证的降落伞装备师在对双降落伞系统中的主降落伞进行叠伞、维护或改装（如果得到授权）时，不需要遵守 § 65.127 至 65.133 节（涉及设施、设备、性能标准、记录、近期经验和铅封）的规定。

SEC. 65.127: FACILITIES AND EQUIPMENT「设施和设备」

No certificated parachute rigger may exercise the privileges of his certificate unless he has at least the following facilities and equipment available to him:
任何持证降落伞装备师，除非至少有下列设施及设备可供使用，否则不得行使其证书所赋予的特权：

(a) A smooth top table at least three feet wide by 40 feet long
一张至少宽 3 英尺、长 40 英尺的平顶桌

(b) Suitable housing that is adequately heated, lighted, and ventilated for drying and airing parachutes
温热条件适当、有照明和通风的空间，以便使降落伞保持干燥或晾干降落伞

(c) Enough packing tools and other equipment to pack and maintain the types of parachutes that he services
足够的叠伞工具和其他设备来对降落伞进行叠伞和维护

(d) Adequate housing facilities to perform his duties and to protect his tools and equipment
空间足够大，以便其履行职责，并保护其工具和设备

SEC. 65.129 PERFORMANCE STANDARDS「性能标准」

No certificated parachute rigger may—
任何持证降落伞装备师不得——

(a) Pack, maintain, or alter any parachute unless he is rated for that type;
在没有某种降落伞类型等级的情况下对该类型降落伞进行叠伞；

(b) Pack a parachute that is not safe for emergency use;
叠不能安全地在紧急情况下起作用的降落伞；

(c) Pack a parachute that has not been thoroughly dried and aired;
叠没有完全干燥和晾干的降落伞；

(d) Alter a parachute in a manner that is not specifically authorized by the Administrator or the manufacturer;
以未经管理局或降落伞制造商明确授权的方式改装降落伞；

(e) Pack, maintain, or alter a parachute in any manner that deviates from procedures approved by the Administrator or the manufacturer of the parachute; or
以任何不符合管理局或降落伞制造商认可的程序对降落伞进行叠伞、维护或改装；或

(f) Exercise the privileges of his certificate and type rating unless he understands the current manufacturer's instructions for the operation involved and has—

在未理解降落伞制造商最新版本说明书的情况下，行使其证书和该降落伞类型等级的特权，并且—

(1) Performed duties under his certificate for at least 90 days within the preceding 12 months; or
在过去 12 个月内，履行其证书职责至少 90 天；或

(2) Shown the Administrator that he is able to perform those duties.
向管理局表明他有能力履行这些职责。

SEC. 65.131: RECORDS「记录」

(a) Each certificated parachute rigger shall keep a record of the packing, maintenance, and alteration of parachutes performed or supervised by him. He shall keep in that record, with respect to each parachute worked on, a statement of
每名持证降落伞装备师应保存其执行或监督的降落伞叠伞、维护和改装的记录。他须在记录内就其所操作过的每一个降落伞，备存一份含有以下内容的说明—

(1) Its type and make;
降落伞类型和品牌；

(2) Its serial number;
降落伞序列号；

(3) The name and address of its owner;
降落伞所有者的姓名和地址；

(4) The kind and extent of the work performed;
完成的工作种类和范围；

(5) The date when and place where the work was performed; and
实施工作的日期和地点；以及

(6) The results of any drop tests made with it.
用该降落伞进行的任何空投测试的结果。

(b) Each person who makes a record under paragraph (a) of this section shall keep it for at least 2 years after the date it is made.
凡根据本节（a）款规定作出记录的人，须自该记录作出之日起，将其保存最少 2 年。

(c) Each certificated parachute rigger who packs a parachute shall write, on the parachute packing record attached to the parachute, the date and place of the packing and a notation of any defects he finds on inspection. He shall sign that record with his name and the number of his certificate.
持证降落伞装备师在叠伞后应在降落伞所附的叠伞记录上注明叠伞日期、地点以及他在检查中发现的任何缺陷。他应在该记录上签名，并注明姓名和证书号码。

SEC. 65.133: SEAL「铅封」

Each certificated parachute rigger must have a seal with an identifying mark prescribed by the Administrator, and a seal press. After packing a parachute he shall seal the pack with his seal in accordance with the manufacturer's recommendation for that type of parachute.
持证降落伞装备师都必须拥有一个由管理局指定的带有识别标志的铅封和一个铅封压印机。叠好降落伞后，应根据制造商对该类型降落伞的建议，用他的铅封进行密封。

SUBCHAPTER F—AIR TRAFFIC AND GENERAL OPERATING RULES「空中交通和一般操作规则」

PART 91—GENERAL OPERATING AND FLIGHT RULES「一般操作和飞行规则」

SEC. 91.1: APPLICABILITY「适用性」

Source: Docket No. 18334, 54 FR 34292, Aug. 18, 1989, unless otherwise noted.
资料来源：案卷号 18334，54 FR 34292，1998 9 年 8 月 18 日，除非另有说明。

(a) Except as provided in paragraphs (b) and (c) of this section and Secs. 91.701 and 91.703, this part prescribes rules governing the operation of aircraft (other than moored balloons, kites, unmanned rockets, and unmanned free balloons, which are governed by part 101 of this chapter, and ultralight vehicles operated in accordance with part 103 of this chapter) within the United States, including the waters within 3 nautical miles of the U.S. coast.
除本节（b）和（c）款以及 91.701 节和 91.703 节的规定外，本部分规定了适用于美国境内（包括美国海岸 3 海里以内的水域）的飞行器的操作规则（除本章第 101 部分规定的系泊气球、风筝、无人火箭和无人自由气球以及根据本章第 103 部分规定的超轻型载具以外）。

(b) Each person operating an aircraft in the airspace overlying the waters between 3 and 12 nautical miles from the coast of the United States shall comply with Secs. 91.1 through 91.21; Secs. 91.101 through 91.143; Secs. 91.151 through 91.159; Secs. 91.167 through 91.193; Sec. 91.203; Sec. 91.205; Secs. 91.209 through 91.217; Sec. 91.221; Secs. 91.303 through 91.319; Sec. 91.323; Sec. 91.605; Sec. 91.609; Secs. 91.703 through 91.715; and 91.903.
在距离美国海岸 3 至 12 海里水域上空操作飞行器的人应遵守第 91.1 至 91.21 节；91.101 至 91.143 节；91.151 至 91.159 节；91.167 至 91.193 节；91.203 节；91.205 节；91.209 至 91.217 节；91.221 节；91.303 至 91.319 节；91.323 节；91.605 节；91.609 节；91.703 至 91.715 节；和 91.903 节的规定；

(c) This part applies to each person on board an aircraft being operated under this part, unless otherwise specified.
除非另有说明，否则本部分适用于根据本部分操作的飞行器上的所有人。

SEC. 91.3: RESPONSIBILITY AND AUTHORITY OF THE PILOT IN COMMAND「机长的责任和权力」

(a) The pilot in command of an aircraft is directly responsible for, and is the final authority as to, the operation of that aircraft.
飞行器的机长对飞行器的运行直接负责，并具有最终决定权。

(b) In an in-flight emergency requiring immediate action, the pilot in command may deviate from any rule of this part to the extent required to meet that emergency.
在飞行中遇到需要立即处置的紧急情况时，机长为确保飞行器和人员的安全，可在必要程度内不遵守本部分的任何规定。

(c) Each pilot in command who deviates from a rule under paragraph (b) of this section shall, upon the request of the Administrator, send a written report of that deviation to the Administrator.
根据本节（b）款做出不遵守规则的行为的机长，应在受到管理局要求时，向管理局递交书面报告。

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」

No person may operate an aircraft that is type certificated for more than one required pilot flight crewmember unless the pilot in command meets the requirements of Sec. 61.58 of this chapter.
除非机长符合本章 61.58 节的要求，否则任何人不得操作一架已获认证需要一名以上机组人员的飞行器。

SEC. 91.7: CIVIL AIRCRAFT AIRWORTHINESS「民用飞行器适航性」

(a) No person may operate a civil aircraft unless it is in an airworthy condition.
任何人不得操作未处于适航状态的民用飞行器。

(b) The pilot in command of a civil aircraft is responsible for determining whether that aircraft is in condition for safe flight. The pilot in command shall discontinue the flight when unairworthy mechanical, electrical, or structural conditions occur.
飞行器的机长负责确认飞行器是否处于可安全飞行的状态。当飞行器的机械、电子或结构出现不适航状态时，机长应当中断该次飞行。

SEC. 91.11: PROHIBITION ON INTERFERENCE WITH CREWMEMBERS「禁止干扰机组人员」

No person may assault, threaten, intimidate, or interfere with a crew member in the performance of the crew member's duties aboard an aircraft being operated.

任何人不得攻击、威胁、恐吓或干扰正在运行的飞行器上的机组人员执行其职责。

SEC. 91.13: CARELESS OR RECKLESS OPERATION「粗心或鲁莽的操作」

(a) Aircraft operations for the purpose of air navigation. No person may operate an aircraft in a careless or reckless manner so as to endanger the life or property of another.
以航空飞行为目的的飞行器操作。任何人员不得以粗心或鲁莽的方式操作飞行器，以免危及他人的生命或财产安全。

(b) Aircraft operations other than for the purpose of air navigation. No person may operate an aircraft, other than for the purpose of air navigation, on any part of the surface of an airport used by aircraft for air commerce (including areas used by those aircraft for receiving or discharging persons or cargo), in a careless or reckless manner so as to endanger the life or property of another.
不以航空飞行为目的的飞行器操作。不以航空飞行为目的时，任何人不得在飞行器和商业航空所使用的机场地面任何区域（包括飞行器用作装载或卸下人员或货物的区域）以粗心或鲁莽的方式操作飞机，以免致危及他人的生命或财产安全。

SEC. 91.15: DROPPING OBJECTS「高空抛物」

No pilot in command of a civil aircraft may allow any object to be dropped from that aircraft in flight that creates a hazard to persons or property. However, this section does not prohibit the dropping of any object if reasonable precautions are taken to avoid injury or damage to persons or property.
民用飞行器的机长不得允许从飞行中的飞行器上投放任何可能对人员或财产造成危害的物体。但是如果已经采取了合理的预防措施，能够避免对人员或财产造成危害，则不受本节限制。

SEC. 91.17: ALCOHOL OR DRUGS「酒精或药物」

(a) No person may act or attempt to act as a crewmember of a civil aircraft—
处于下列身体状况的人员不得担任或试图担任民用飞行器的机组成员：

(1) Within 8 hours after the consumption of any alcoholic beverage;
饮用含酒精饮料之后的 8 小时以内；

(2) While under the influence of alcohol;
处于酒精作用之下；

(3) While using any drug that affects the person's faculties in any way contrary to safety; or
使用了影响人体官能的药品，可能对安全产生危害；或

(4) While having .04 percent by weight or more alcohol in the blood.
其血液中酒精含量，以重量为计量单位，达到或超过 0.04%。

(b) Except in an emergency, no pilot of a civil aircraft may allow a person who appears to be intoxicated or who demonstrates by manner or physical indications that the individual is under the influence of drugs (except a medical patient under proper care) to be carried in that aircraft.
除紧急情况外，民用飞行器的飞行员不得在飞行器上载运呈现醉态或者由其举止或身体状态可判明受到药物影响的人员（受到看护的病人除外）。

(c) A crewmember shall do the following:
机组成员应进行以下工作：

(1) On request of a law enforcement officer, submit to a test to indicate the percentage by weight of alcohol in the blood, when—
在以下情况中，根据执法人员的要求，进行血液中酒精重量百分比的检测

(i) The law enforcement officer is authorized under State or local law to conduct the test or to have the test conducted; and
根据州或地方法律，执法人员获得授权进行检测或使检测被执行；以及

(ii) The law enforcement officer is requesting submission to the test to investigate a suspected violation of State

or local law governing the same or substantially similar conduct prohibited by paragraph (a)(1), (a) (2), or (a)(4) of this section.
执法人员要求就涉嫌违反本节（a）（1）、（a）（2）或（a）（4）所禁止的行为，或州和地方法律规定的、与这些行为相同或实质上类似的行为进行调查。

(2) Whenever the Administrator has a reasonable basis to believe that a person may have violated paragraph (a)(1), (a)(2), or (a)(4) of this section, that person shall, upon request by the Administrator, furnish the Administrator, or authorize any clinic, hospital, doctor, or other person to release to the Administrator, the results of each test taken within 4 hours after acting or attempting to act as a crewmember that indicates percentage by weight of alcohol in the blood.
当管理局有合理理由认为某人有可能违反本节（a）（1）、（a）（2）或（a）（4）的规定时，此人应当根据管理局的要求，将其担任或试图担任机组成员后 4 小时内所做的血液酒精含量百分比测试结果提供给局方。

(d) Whenever the Administrator has a reasonable basis to believe that a person may have violated paragraph (a) (3) of this section, that person shall, upon request by the Administrator, furnish the Administrator, or authorize any clinic, hospital, doctor, or other person to release to the Administrator, the results of each test taken within 4 hours after acting or attempting to act as a crewmember that indicates the presence of any drugs in the body.
当管理局有合理理由认为某人可能违反本节（a）（3）的规定时，该人应当根据管理局的要求，向管理局提供或授权任何诊疗所、医院、医生或其他人向管理局提供，在该人担任或试图担任机组人员后 4 小时内所做的各次检测结果，以检测任何存在于体内的药物。

(e) Any test information obtained by the Administrator under paragraph (c) or (d) of this section may be evaluated in determining a person's qualifications for any airman certificate or possible violations of this chapter and may be used as evidence in any legal proceeding under section 602, 609, or 901 of the Federal Aviation Act of 1958.
管理局根据本节（c）或（d）规定获得的任何检测信息，可用以评估某人是否有资格拥有任何航空人员证书，或是否可能违反本章规定，并可在根据 1958 年《联邦航空法》第 602、609 或 901 节进行的任何法律诉讼中用作证据。

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」

(a) Except as provided in paragraph (b) of this section, no person may operate a civil aircraft within the United States with knowledge that narcotic drugs, marihuana, and depressant or stimulant drugs or substances as defined in Federal or State statutes are carried in the aircraft.
除本节第（b）款规定的情况外，任何人不得在知悉飞行器上携带麻醉药品、大麻、镇静剂或兴奋剂或联邦或州法规中定义的物质的情况下在美国境内操作民用飞行器。

(b) Paragraph (a) of this section does not apply to any carriage of narcotic drugs, marihuana, and depressant or stimulant drugs or substances authorized by or under any Federal or State statute or by any Federal or State agency.
本节第（a）款不适用于经任何联邦或州法规或任何联邦或州机构授权，或根据任何联邦或州法规或任何联邦或州机构授权的任何麻醉药品、大麻、镇静剂或兴奋剂或物质的运输。

SEC. 91.101: APPLICABILITY「适用性」

Source: Docket No. 18334, 54 FR 34294, Aug. 18, 1989, unless otherwise noted.
资料来源：案卷号 18334，54 FR 34294，1989 年 8 月 18 日，除非另有说明。

This subpart prescribes flight rules governing the operation of aircraft within the United States and within 12 nautical miles from the coast of the United States.
本子部分规定了飞行器在美国境内和距美国海岸 12 海里范围内运行的飞行规则。

SEC. 91.103: PREFLIGHT ACTION「飞行前的行为」

Each pilot in command shall, before beginning a flight, become familiar with all available information concerning that flight. This information must include—

机长在开始飞行前应熟悉与该次飞行有关的所有可用信息。该信息必须包括：

(a) For a flight under IFR or a flight not in the vicinity of an airport, weather reports and forecasts, fuel requirements, alternatives available if the planned flight cannot be completed, and any known traffic delays of which the pilot in command has been advised by ATC;
对于仪表飞行或远离机场的飞行：气象报告和预报、燃料要求、飞行计划无法完成时的备用方案，以及空管通知机长的任何已知交通延误；

(b) For any flight, runway lengths at airports of intended use, and the following takeoff and landing distance information:
对于任何飞行：计划使用的机场的跑道长度，以及下列起飞和着陆距离信息：

(1) For civil aircraft for which an approved Airplane or Rotorcraft Flight Manual containing takeoff and landing distance data is required, the takeoff and landing distance data contained therein; and
对于根据经认证的飞机或旋翼机飞行手册，需要提供起飞和着陆距离数据的民用飞行器：飞行员应熟悉手册中的起飞和着陆距离数据

(2) For civil aircraft other than those specified in paragraph (b)(1) of this section, other reliable information appropriate to the aircraft, relating to aircraft performance under expected values of airport elevation and runway slope, aircraft gross weight, and wind and temperature.
对于本节第（b）（1）规定以外的民用飞行器：与机场高度和跑道坡度、飞行器总重、风况和温度预测值下的飞行器性能有关的适用于该飞行器的其他可靠信息。

SEC. 91.107: USE OF SAFETY BELTS, SHOULDER HARNESSES, AND CHILD RESTRAINT SYSTEMS
「安全带、肩带和儿童约束系统的使用」

(a) Unless otherwise authorized by the Administrator—
除非管理局另有授权—

(1) No pilot may take off a U.S.- registered civil aircraft (except a free balloon that incorporates a basket or gondola, or an airship type certificated before November 2, 1987) unless the pilot in command of that aircraft ensures that each person on board is briefed on how to fasten and unfasten that person's safety belt and, if installed, shoulder harness.
任何飞行员不得在未确认机上人员都已被简要告知如何系上和解开安全带、肩带（如有）的情况下，操作在美国注册的民用飞行器起飞（除带有吊篮或吊舱的自由气球，或 1987 年 11 月 2 日前获认证的飞艇型号以外）。

(2) No pilot may cause to be moved on the surface, take off, or land a U.S.- registered civil aircraft (except a free balloon that incorporates a basket or gondola, or an airship type certificated before November 2, 1987) unless the pilot in command of that aircraft ensures that each person on board has been notified to fasten his or her safety belt and, if installed, his or her shoulder harness.
任何飞行员不得在未确认机上人员都已被告知如何系上安全带、肩带（如有）的情况下，操作在美国注册的民用飞行器在地面移动、起飞或降落（除带有吊篮或吊舱的自由气球，或 1987 年 11 月 2 日前获认证的飞艇型号以外）。

(3) Except as provided in this paragraph, each person on board a U.S.-registered civil aircraft (except a free balloon that incorporates a basket or gondola or an airship type certificated before November 2, 1987) must occupy an approved seat or berth with a safety belt and, if installed, shoulder harness, properly secured about him or her during movement on the surface, takeoff, and landing. For seaplane and float equipped rotorcraft operations during movement on the surface, the person pushing off the seaplane or rotorcraft from the dock and the person mooring the seaplane or rotorcraft at the dock are excepted from the preceding seating and safety belt requirements. Notwithstanding the preceding requirements of this paragraph, a person may:
除本款规定外，在美国注册的民用飞行器上的所有人（除带有吊篮或吊舱的自由气球，或 1987 年 11 月 2 日前获认证的飞艇型号以外）必须坐在有安全带、肩带（如有）的，经认证的座位或铺位上，且在地面移动、起飞和着陆期间系好安全带和肩带（如有）。水上飞行器和配备浮筒的旋翼机在水面上运行时，将水上飞行器

或旋翼机推离泊位的人员、将水上飞行器或旋翼机停泊在泊位的人员不受上述座椅和安全带要求的限制。本款前面的规定有以下例外：

(i) Be held by an adult who is occupying an approved seat or berth, provided that the person being held has not reached his or her second birthday and does not occupy or use any restraining device;
占有经认证的座位或铺位的成年人可抱着 2 岁以下的无约束设备的儿童；

(ii) Use the floor of the aircraft as a seat, provided that the person is on board for the purpose of engaging in sport parachuting;
进行跳伞运动的人员可使用飞行器的地板作为座位；

SEC. 91.111: OPERATING NEAR OTHER AIRCRAFT「在其他飞行器附近操作」

(a) No person may operate an aircraft so close to another aircraft as to create a collision hazard.
任何人不得在可能造成碰撞危险的距离范围内操纵一架飞行器靠近另一驾飞行器。

(b) No person may operate an aircraft in formation flight except by arrangement with the pilot in command of each aircraft in the formation.
除非编队中每架飞行器的机长互有沟通安排，任何人不得在编队飞行中操作飞行器。

(c) No person may operate an aircraft, carrying passengers for hire, in formation flight.
任何人不得操作经营载客出租的飞行器进行编队飞行。

SEC. 91.113: RIGHT-OF-WAY RULES: EXCEPT WATER OPERATIONS「通行权规则：水上作业除外」

(a) Inapplicability. This section does not apply to the operation of an aircraft on water.
不适用情形：本节不适用于水上飞行器的操作。

(b) General. When weather conditions permit, regardless of whether an operation is conducted under instrument flight rules or visual flight rules, vigilance shall be maintained by each person operating an aircraft so as to see and avoid other aircraft. When a rule of this section gives another aircraft the right-of-way, the pilot shall give way to that aircraft and may not pass over, under, or ahead of it unless well clear.
总则：天气条件允许时，无论是根据仪表飞行规则还是目视飞行规则进行飞行，操作飞行器的人都应保持警惕，以便看到和避开其他飞行器。当根据本节规定，另一架飞行器有优先通行权时，飞行员应让路给该飞行器，除非完全净空，否则不得在该飞行器上方、下方或前方通过。

(c) In distress. An aircraft in distress has the right-of-way over all other air traffic.
遇到危险时：遇险飞行器有优先于所有其他空中飞行器的通行权。

(d) Converging. When aircraft of the same category are converging at approximately the same altitude (except head-on, or nearly so), the aircraft to the other's right has the right-of-way. If the aircraft are of different categories—
航线交汇。当同一一级分类（Category）的飞行器在大约相同的高度汇合时（迎头或几乎迎头接近除外），位于对方右侧的飞行器有通行权。如果飞行器是不同分类的—

(1) A balloon has the right-of-way over any other category of aircraft;
气球比其他分类的飞行器有优先通行权；

(2) A glider has the right-of-way over an airship, airplane, or rotorcraft; and
滑翔机对飞艇、飞行器或旋翼机有优先通行权；以及

(3) An airship has the right-of-way over an airplane or rotorcraft. However, an aircraft towing or refueling other aircraft has the right-of-way over all other engine-driven aircraft.
飞艇对飞行器或旋翼机有优先通行权。然而，对另一架飞行器进行拖曳或加油的飞行器比任何其他发动机驱动的飞行器拥有优先通行权。

(e) Approaching head-on. When aircraft are approaching each other head-on, or nearly so, each pilot of each aircraft shall alter course to the right.
迎头接近：当飞行器迎头接近或几乎迎头接近时，每架飞行器的飞行员都应向右改变航向。

(f) Overtaking. Each aircraft that is being overtaken has the right-of-way and each pilot of an overtaking aircraft shall alter course to the right to pass well clear.

超车：被超车的飞行器有优先通行权，进行超车的飞行员应当向右改变航向以安全通过。

(g) Landing. Aircraft, while on final approach to land or while landing, have the right-of-way over other aircraft in flight or operating on the surface, except that they shall not take advantage of this rule to force an aircraft off the runway surface which has already landed and is attempting to make way for an aircraft on final approach. When two or more aircraft are approaching an airport for the purpose of landing, the aircraft at the lower altitude has the right-of-way, but it shall not take advantage of this rule to cut in front of another which is on final approach to land or to overtake that aircraft.

着陆：飞行器在最后进近着陆或着陆时，有超过其他正在飞行或在水面上运行的飞行器的优先通行权，但不得利用本条规定迫使已着陆并正在试图为其他进近飞行器让路的飞行器离开跑道。当两架或两架以上的飞行器正在接近机场以便着陆时，处于较低高度的飞行器有优先通行权，但不得利用本条规则在另一架正在最后进近着陆时超过该飞行器或飞行器前面切入。

SEC. 91.119: MINIMUM SAFE ALTITUDES: GENERAL「最低安全高度：概述」

Except when necessary for takeoff or landing, no person may operate an aircraft below the following altitudes:

除必要的起飞或降落外，任何人不得在下列高度以下操作飞行器：

(a) Anywhere. An altitude allowing, if a power unit fails, an emergency landing without undue hazard to persons or property on the surface.

任何区域：在动力装置失效的情况下，允许紧急着陆且不会对地面人员或财产造成不应有的危害的高度。

(b) Over congested areas. Over any congested area of a city, town, or settlement, or over any open air assembly of persons, an altitude of 1,000 feet above the highest obstacle within a horizontal radius of 2,000 feet of the aircraft.

人员密集区：在城市、城镇或居民点内的任何拥挤区域，或在任何露天人员集会上，水平半径 2000 英尺内，飞行器的高度应在最高障碍物上方 1000 英尺以上。

(c) Over other than congested areas. An altitude of 500 feet above the surface, except over open water or sparsely populated areas. In those cases, the aircraft may not be operated closer than 500 feet to any person, vessel, vehicle, or structure.

人员密集区以外的区域：地面以上 500 英尺（开阔水域或人口稀少的地区除外）。在这种情况下，飞行器不得在离任何人、船只、车辆或建筑物 500 英尺以内的区域操作。

(d) Helicopters. Helicopters may be operated at less than the minimums prescribed in paragraph (b) or (c) of this section if the operation is conducted without hazard to persons or property on the surface. In addition, each person operating a helicopter shall comply with any routes or altitudes specifically prescribed for helicopters by the Administrator.

直升机：如果直升机的操作不会对地面人员或财产造成危害，则可在低于本节第（b）或（c）款规定的最低高度内操作直升机。此外，如有管理局明确指定的航线或高度，操作直升机的人应遵守航线和高度规定。

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」

(a) General. Unless otherwise authorized or required, each person operating an aircraft on or in the vicinity of an airport in a Class G airspace area must comply with the requirements of this section.

总则：除非另有授权或要求，在 G 类空域的机场或机场附近操作飞行器的人必须遵守本节要求。

(b) Direction of turns. When approaching to land at an airport without an operating control tower in Class G airspace—

转向方向：接近没有运行中的塔台的 G 类空域机场以进行着陆时—

(1) Each pilot of an airplane must make all turns of that airplane to the left unless the airport displays approved light signals or visual markings indicating that turns should be made to the right, in which case the pilot must make all turns to the right; and

飞机的飞行员在转弯时只能向左转，除非机场亮出批准的灯光信号或视觉标识来指示飞机向右转向，而在这种情况下，飞行员必须使飞机向右转向；以及

(2) Each pilot of a helicopter must avoid the flow of fixed-wing aircraft.

直升机的飞行员必须避开固定翼飞机的气流。

(c) Flap settings. Except when necessary for training or certification, the pilot in command of a civil turbojet-powered aircraft must use, as a final flap setting, the minimum certificated landing flap setting set forth in the approved performance information in the Airplane Flight Manual for the applicable conditions. However, each pilot in command has the final authority and responsibility for the safe operation of the pilot's airplane, and may use a different flap setting for that airplane if the pilot determines that it is necessary in the interest of safety.
襟翼设置：除非在训练或考取证书时有必要，民用涡轮喷气动力飞机的机长必须在适用条件下，使用飞机飞行手册中批准的性能信息中规定的最低认证着陆襟翼角度作为最终襟翼设置。然而，机长对飞机的安全操作具有最终的权力和责任，如果飞行员认为为了安全起见有必要，可使用不同的襟翼设置。

(d) Communications with control towers. Unless otherwise authorized or required by ATC, no person may operate an aircraft to, from, through, or on an airport having an operational control tower unless two-way radio communications are maintained between that aircraft and the control tower. Communications must be established prior to 4 nautical miles from the airport, up to and including 2,500 feet AGL. However, if the aircraft radio fails in flight, the pilot in command may operate that aircraft and land if weather conditions are at or above basic VFR weather minimums, visual contact with the tower is maintained, and a clearance to land is received. If the aircraft radio fails while in flight under IFR, the pilot must comply with Sec. 91.185.
与塔台的通信：除非空管另有授权或要求，在未与机场塔台保持双向无线电通信的情况下，任何人不得飞往、飞离、飞过有塔台的机场。通信必须在距机场 4 海里之前建立，地面高度不超过 2500 英尺（含 2500 英尺）。但是，如果飞行器无线电在飞行中出现故障，且如果天气条件达到或超过基本的目视飞行（VFR）最低天气条件，且塔台保持在视野范围内，且飞机收到着陆许可，则机长可操作飞机降落。如果飞行器在仪表飞行条件（IFR）下飞行时无线电出现故障，飞行员必须遵守 91.185 节的规定。

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」

(a) Unless otherwise required by part 93 of this chapter or unless otherwise authorized or required by the ATC facility having jurisdiction over the Class E airspace area, each person operating an aircraft on or in the vicinity of an airport in a Class E airspace area must comply with the requirements of Sec. 91.126.
除非本章第 93 部分另有要求，或除非对 E 类空域具有管辖权的空中交通管制部门另有授权或要求，否则在 E 类空域机场或机场附近操作飞行器的人必须遵守 91.126 节的规定。

(b) Departures. Each pilot of an aircraft must comply with any traffic patterns established for that airport in part 93 of this chapter.
离港：飞行器的飞行员必须遵守本章第 93 部分为机场确定的起落航线。

(c) Communications with control towers. Unless otherwise authorized or required by ATC, no person may operate an aircraft to, from, through, or on an airport having an operational control tower unless two-way radio communications are maintained between that aircraft and the control tower. Communications must be established prior to 4 nautical miles from the airport, up to and including 2,500 feet AGL. However, if the aircraft radio fails in flight, the pilot in command may operate that aircraft and land if weather conditions are at or above basic VFR weather minimums, visual contact with the tower is maintained, and a clearance to land is received. If the aircraft radio fails while in flight under IFR, the pilot must comply with Sec. 91.185.
与塔台的通信：除非空管另有授权或要求，在未与机场塔台保持双向无线电通信的情况下，任何人不得飞往、飞离、飞过有塔台的机场。通信必须在距机场 4 海里之前建立，地面高度不超过 2500 英尺（含 2500 英尺）。但是，如果飞行器无线电在飞行中出现故障，且如果天气条件达到或超过基本的目视飞行（VFR）最低天气条件，且塔台保持在视野范围内，且飞机收到着陆许可，则机长可操作飞机降落。如果飞行器在仪表飞行条件（IFR）下飞行时无线电出现故障，飞行员必须遵守 91.185 节的规定。

SEC. 91.151: FUEL REQUIREMENTS FOR FLIGHT IN VFR CONDITIONS「目视飞行条件（VFR）下的燃料要求」

(a) No person may begin a flight in an airplane under VFR conditions unless (considering wind and forecast weather

conditions) there is enough fuel to fly to the first point of intended landing and, assuming normal cruising speed—
除非（考虑到风和天气预报情况）有足够的燃料飞到预定的第一个着陆点，任何人不得在目视条件下开始飞行作业。而且，在假定以正常巡航速度飞行的情况下，飞行器应符合以下条件—

(1) During the day, to fly after that for at least 30 minutes; or
在白天飞行时，至少能再多飞行 30 分钟；或

(2) At night, to fly after that for at least 45 minutes.
在夜间飞行时，至少能再多飞行 45 分钟。

(b) No person may begin a flight in a rotorcraft under VFR conditions unless (considering wind and forecast weather conditions) there is enough fuel to fly to the first point of intended landing and, assuming normal cruising speed, to fly after that for at least 20 minutes.
除非（考虑到风和天气预报情况）有足够的燃料飞到预定的第一个着陆点，任何人不得在目视条件下开始使用旋翼机飞行。而且，在假定以正常巡航速度飞行的情况下，旋翼机要能再多飞行至少 20 分钟。

SEC. 91.155: BASIC VFR WEATHER MINIMUMS「基本目视飞行的最低天气标准」

(a) Except as provided in paragraph (b) of this section and Sec. 91.157, no person may operate an aircraft under VFR when the flight visibility is less, or at a distance from clouds that is less, than that prescribed for the corresponding altitude and class of airspace in the following table:
除本节第（b）款和 91.157 节规定，当飞行能见度或与云层的距离不符合下表规定时，任何人不得在目视条件下操作飞行器：

	Distance from Airspace **距空域距离**	**Flight Visibility** **飞行能见度**	**Clouds** **云**	
Class A **A 类**		Not Applicable 不适用	Not Applicable 不适用	
Class B **B 类**		3 statute miles 3 法定英里	Clear of Clouds 无云	
Class C **C 类**		3 statute miles 3 法定英里	500 feet below. 1,000 feet above. 2,000 feet horizontal.	500 英尺以下 1000 英尺以上 水平 2,000 英尺
Class D **D 类**		3 statute miles 3 法定英里	500 feet below. 1,000 feet above. 2,000 feet horizontal.	500 英尺以下 1000 英尺以上 水平 2,000 英尺
Class E **E 类**	Less than 10,000 feet MSL 小于海拔 10,000 英尺	3 statute miles 3 法定英里	500 feet below. 1,000 feet above. 2,000 feet horizontal.	500 英尺以下 1000 英尺以上 水平 2,000 英尺
	At or above 10,000 feet MSL 海拔在 10,000 英尺或以上	5 statute miles 5 法定英里	1,000 feet below. 1,000 feet above. 1 statute mile horizontal.	1000 英尺以下 1000 英尺以上 水平 1 英里
Class G **G 类**	1,200 feet or less above the surface (regardless of MSL altitude). 离地 1,200 英尺或更更低（无论海拔高度如何）			
	Day, except as provided in Sec. 91.155(b). 日间 & 第 91.155（b）中规定的情况除外	1 statute miles 1 法定英里	Clear of Clouds 无云	
	Night, except as provided in Sec. 91.155(b). 夜间 & 第 91.155（b）中规定的情况除外	3 statute miles 3 法定英里	500 feet below. 1,000 feet above. 2,000 feet horizontal.	500 英尺以下 1000 英尺以上 水平 2,000 英尺
	More than 1,200 feet above the surface but less than 10,000 feet MSL 离地 1200 英尺以上但低于海拔 10,000 英尺			

	Day 日间	1 statute miles 1 法定英里	500 feet below. 1,000 feet above. 2,000 feet horizontal.	500 英尺以下 1000 英尺以上 水平 2,000 英尺
	Night 夜间	3 statute miles 3 法定英里	500 feet below. 1,000 feet above. 2,000 feet horizontal.	500 英尺以下 1000 英尺以上 水平 2,000 英尺
	More than 1,200 feet above the surface and at or above 10,000 feet MSL. 离地 1,200 英尺以上，且海拔 10,000 英尺或以上。	5 statute miles 5 法定英里	1,000 feet below 1,000 feet above. 1 statute mile horizontal.	1000 英尺以下 1000 英尺以上 水平 1 英里

(b) Class G Airspace. Notwithstanding the provisions of paragraph (a) of this section, the following operations may be conducted in Class G airspace below 1,200 feet above the surface:
G 类空域。尽管有本节第（a）款的规定，在地面 1200 英尺以下的 G 类空域可以进行下列操作：

(1) Helicopter. A helicopter may be operated clear of clouds if operated at a speed that allows the pilot adequate opportunity to see any air traffic or obstruction in time to avoid a collision.
直升机：如果飞行速度允许飞行员有足够的机会及时看到空中交通或阻碍物，以避免碰撞，则直升机可在云层以外飞行。

(2) Airplane. When the visibility is less than 3 statute miles but not less than 1 statute mile during night hours, an airplane may be operated clear of clouds if operated in an airport traffic pattern within one-half mile of the runway.
飞机：当夜间能见度小于 3 法定英里但不小于 1 法定英里时，如果在跑道半英里范围内遵守机场起落航线，则飞机可在云层以外飞行。

(c) Except as provided in Sec. 91.157, no person may operate an aircraft beneath the ceiling under VFR within the lateral boundaries of controlled airspace designated to the surface for an airport when the ceiling is less than 1,000 feet.
除第 91.157 节规定外，当云底高度低于 1000 英尺时，任何人不得在指定的机场管制空域的横向边界内，在云底高度以下操作飞行器目视飞行。

(d) Except as provided in Sec. 91.157 of this part, no person may take off or land an aircraft, or enter the traffic pattern of an airport, under VFR, within the lateral boundaries of the surface areas of Class B, Class C, Class D, or Class E airspace designated for an airport—
除第 91.157 节规定外，任何人不得在为机场指定的 B、C、D 或 E 类空域的地面区域的横向边界内，在目视条件下驾驶飞行器起飞或降落，或进入机场的起落航线—

(1) Unless ground visibility at that airport is at least 3 statute miles; or
除非该机场的地面能见度至少为 3 法定英里；或

(2) If ground visibility is not reported at that airport, unless flight visibility during landing or takeoff, or while operating in the traffic pattern is at least 3 statute miles.
如果该机场未报告地面能见度，除非在着陆或起飞期间或在起落航线内飞行期间的飞行能见度至少为 3 法定英里。

(e) For the purpose of this section, an aircraft operating at the base altitude of a Class E airspace area is considered to be within the airspace directly below that area.
就本节而言，在 E 类空域的最低高度飞行的飞行器被视为在该 E 类空域正下方的空域内。

SEC. 91.211: SUPPLEMENTAL OXYGEN「氧气补充」

(a) General. No person may operate a civil aircraft of U.S. registry—
概述：任何人不得在以下情形操作在美国注册的民用飞行器—

(1) At cabin pressure altitudes above 12,500 feet (MSL) up to and including 14,000 feet (MSL) unless the required minimum flight crew is provided with and uses supplemental oxygen for that part of the flight at those altitudes

that is of more than 30 minutes duration;
客舱的压力高度在海拔 12500 英尺以上至 14000 英尺以下时。除非在飞行高度呆超过 30 分钟的情况下，向所需的最低限度飞行机组人员提供和使用补充氧气；

(2) At cabin pressure altitudes above 14,000 feet (MSL) unless the required minimum flight crew is provided with and uses supplemental oxygen during the entire flight time at those altitudes; and
客舱的压力高度在海拔 14000 英尺以上时。除非在该高度飞行的整个飞行时间内向机组人员提供并使用补充氧气；以及

(3) At cabin pressure altitudes above 15,000 feet (MSL) unless each occupant of the aircraft is provided with supplemental oxygen.
客舱的压力高度在海拔 15000 英尺以上时。除非为每位乘客提供补充氧气。

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」

(a) All airspace: U.S.-registered civil aircraft. For operations not conducted under part 121 or 135 of this chapter, ATC transponder equipment installed must meet the performance and environmental requirements of any class of TSO-C74b (Mode A) or any class of TSO-C74c (Mode A with altitude reporting capability) as appropriate, or the appropriate class of TSO-C112 (Mode S).
所有空域：在美国注册的民用飞行器。对于非依照第 121 或 135 部分的规定执行的飞行器作业，飞行器所安装的空中交通管制应答机设备（以下简称应答机）必须符合性能或运行环境的要求（任何符合 TSO-C74b（A 模式）标准的类型，或任何符合 TSO-C74c（A 模式，带高度报告功能）标准的类型，视情况而定，又或者符合 TSO-C112 标准下的合适类型）。

(b) All airspace. Unless otherwise authorized or directed by ATC, and except as provided in paragraph (e)(1) of this section, no person may operate an aircraft in the airspace described in paragraphs (b)(1) through (5) of this section, unless that aircraft is equipped with an operable coded radar beacon transponder having either Mode 3/A 4096 code capability, replying to Mode 3/A interrogations with the code specified by ATC, or a Mode S capability, replying to Mode 3/A interrogations with the code specified by ATC and intermode and Mode S interrogations in accordance with the applicable provisions specified in TSO C-112, and that aircraft is equipped with automatic pressure altitude reporting equipment having a Mode C capability that automatically replies to Mode C interrogations by transmitting pressure altitude information in 100-foot increments. The requirements of this paragraph (b) apply to—
所有空域。除非空中交通管制另有授权或指令，且除本节（e）（1）的规定以外，任何人不得在本节（b）（1）至（b）（5）所述空域中操作飞行器，除非飞行器配备有可操作的编码雷达信标应答机，应答机要么具备 3/A 模式的 4096 编码能力，可按照空中交通管制指定编码回应 3/A 模式下的查询申请，要么具备 S 模式的能力，可按照空中交通管制指定编码回应 3/A 模式下的查询申请，以及根据 TSO C-112 标准中的适用条款的要求回应中间模式和 S 模式下的查询申请，而且飞行器配备了自动气压和高度报告设备，设备具有 C 模式的能力，可自动回复 C 模式下的查询申请（以 100 英尺为增量传送气压高度数据）。本节（b）款要求适用于以下空域—

(1) All aircraft. In Class A, Class B, and Class C airspace areas;
所有飞行器：A、B、C 类空域；

(2) All aircraft. In all airspace within 30 nautical miles of an airport listed in appendix D, section 1 of this part from the surface upward to 10,000 feet MSL;
所有飞行器：本部分附录 D 第 1 节所列的机场的 30 海里范围内，从地面到海拔 10000 英尺的空域；

(3) Notwithstanding paragraph (b)(2) of this section, any aircraft which was not originally certificated with an engine-driven electrical system or which has not subsequently been certified with such a system installed, balloon or glider may conduct operations in the airspace within 30 nautical miles of an airport listed in appendix D, section 1 of this part provided such operations are conducted—
本节（b）（2）款的例外情形：任何最初未获电气系统认证的，或虽然安装了此类系统，但未获得此类系统认证的飞行器，以及气球或滑翔机，都可在本部分附录 D 第 1 节所列的机场的 30 海里范围内执行飞行作业，

前提是这些飞行作业符合以下条件—

(i) Outside any Class A, Class B, or Class C airspace area; and
在 A、B、C 类空域以外执行；以及

(ii) Below the altitude of the ceiling of a Class B or Class C airspace area designated for an airport or 10,000 feet MSL, whichever is lower; and
高度低于指定用于机场的 B、C 类空域的最高高度或海拔 10000 英尺，以两者中的较低者为准；以及

(4) All aircraft in all airspace above the ceiling and within the lateral boundaries of a Class B or Class C airspace area designated for an airport upward to 10,000 feet MSL; and
在为机场指定的，最高不超过海拔 10000 英尺的，B 类或 C 类空域的最高高度以上的横向边界内的飞行器；以及

(5) All aircraft except any aircraft which was not originally certificated with an engine-driven electrical system or which has not subsequently been certified with such a system installed, balloon, or glider—
任何飞行器，除任何最初未获电气系统认证的，或虽然安装了此类系统，但未获得此类系统认证的飞行器、气球、滑翔机以外—

(i) In all airspace of the 48 contiguous states and the District of Columbia at and above 10,000 feet MSL, excluding the airspace at and below 2,500 feet above the surface; and
本土 48 州和哥伦比亚特区内海拔 10000 英尺及以上的所有空域，不含地面以上 2500 英尺的空域；以及

(ii) In the airspace from the surface to 10,000 feet MSL within a 10-nautical-mile radius of any airport listed in appendix D, section 2 of this part, excluding the airspace below 1,200 feet outside of the lateral boundaries of the surface area of the airspace designated for that airport.
本部分附录 D 第 2 节所列机场的 10 海里范围内，由地面延伸至海拔 10000 英尺的空域，不含离地 1200 英尺以下的，为机场指定的、机场的地面横向边界以外的空域。

(c) Transponder-on operation. Except as provided in paragraph (e)(2) of this section, while in the airspace as specified in paragraph (b) of this section or in all controlled airspace, each person operating an aircraft equipped with an operable ATC transponder maintained in accordance with §91.413 shall operate the transponder, including Mode C equipment if installed, and shall reply on the appropriate code or as assigned by ATC, unless otherwise directed by ATC when transmitting would jeopardize the safe execution of air traffic control functions.
开启应答机的飞行作业。除本节（e）（2）规定外，当位于本节（b）款指定的空域内，或者位于任何管制空域内时，操作配有可操作的、根据 91.413 节规定维护的应答机的飞行器的人员应对应答机（包括含 C 模式的设备，如有）进行操作，并且应使用合适的编码，或按照空中交通管制指定的编码进行回复，除非因为信号的传输会破坏空中交通管制的安全运行，使得空中交通管制另有指示。

(d) ATC authorized deviations. Requests for ATC authorized deviations must be made to the ATC facility having jurisdiction over the concerned airspace within the time periods specified as follows:
申请获得空中交通管制授权，以无需遵守相关要求时，必须向在相关时段内对相关空域有管辖权的空中交通管制部门提交申请，具体如下：

(1) For operation of an aircraft with an operating transponder but without operating automatic pressure altitude reporting equipment having a Mode C capability, the request may be made at any time.
对于配有可运行的应答机，但没有可运行的、有 C 模式的自动气压高度报告设备的飞行器的飞行作业，可以在任何时候提出申请。

(2) For operation of an aircraft with an inoperative transponder to the airport of ultimate destination, including any intermediate stops, or to proceed to a place where suitable repairs can be made or both, the request may be made at any time.
对于应答机失效的飞行器，当飞行器飞向目的地机场以及任何中途停留点，或前往可以进行适当维修的地点，或同时符合两种情况时，申请可以在任何时候提出。

(3) For operation of an aircraft that is not equipped with a transponder, the request must be made at least one hour before the proposed operation.
对于没有配备应答机的飞行器，申请必须在拟进行的飞行器作业之前至少 1 小时提出。

SEC. 91.223: TERRAIN AWARENESS AND WARNING SYSTEM「地形感知和警告系统」

(a) Airplanes manufactured after March 29, 2002. Except as provided in paragraph (d) of this section, no person may operate a turbine-powered U.S.- registered airplane configured with six or more passenger seats, excluding any pilot seat, unless that airplane is equipped with an approved terrain awareness and warning system that as a minimum meets the requirements for Class B equipment in Technical Standard Order (TSO)–C151.
2002 年 3 月 29 日以后制造的飞机：除本节第（d）款规定外，任何人不得操作有六个或六个以上乘客座椅（不包括飞行员座椅）的在美国注册的涡轮动力飞机，除非该飞机配备经认证的、至少满足技术标准规定（TSO）-C151 中 B 类设备的要求的地形感知和警告系统。

(b) Airplanes manufactured on or before March 29, 2002. Except as provided in paragraph (d) of this section, no person may operate a turbine-powered U.S.- registered airplane configured with six or more passenger seats, excluding any pilot seat, after March 29, 2005, unless that airplane is equipped with an approved terrain awareness and warning system that as a minimum meets the requirements for Class B equipment in Technical Standard Order (TSO)-C151. (Approved by the Office of Management and Budget under control number 2120-0631)
2002 年 3 月 29 日或之前制造的飞机：除本节第（d）款规定外，任何人不得在 2005 年 3 月 29 日之后操作有六个或六个以上乘客座椅（不包括飞行员座椅）的在美国注册的涡轮动力飞机，除非该飞机配备经认证的、至少满足技术标准规定（TSO）- C151 中 B 类设备的要求的地形感知和警告系统（由管理和预算办公室认证，控制编号：2120-0631）。

(c) Airplane Flight Manual. The Airplane Flight Manual shall contain appropriate procedures for—
飞机飞行手册。飞机飞行手册的内容应包含以下方面的适当流程—

(1) The use of the terrain awareness and warning system; and
地形感知和警告系统的使用；以及

(2) Proper flight crew reaction in response to the terrain awareness and warning system audio and visual warnings.
飞行机组人员对地形感知和警报系统音频和视频警报的正确反应。

(d) Exceptions. Paragraphs (a) and (b) of this section do not apply to—
例外情况：本节第（a）和（b）款不适用于—

(1) Parachuting operations when conducted entirely within a 50 nautical mile radius of the airport from which such local flight operations began.
在进行跳伞作业的机场的 50 海里半径范围内进行跳伞作业。

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」

(a) After January 1, 2020, unless otherwise authorized by ATC, no person may operate an aircraft in Class A airspace unless the aircraft has equipment installed that—
2020 年 1 月 1 日以后，除非空中交通管制另有授权，任何人不得在 A 类空域操作飞行器，除非飞行器安装了—

(1) Meets the requirements in TSO-C166b, Extended Squitter Automatic Dependent Surveillance-Broadcast (ADS-B) and Traffic Information Service-Broadcast (TIS-B) Equipment Operating on the Radio Frequency of 1090 Megahertz (MHz); and
符合 TSO-C166b 规定的、扩展的 Squitter 自动相关监视广播（ADS-B）和在 1090 兆赫无线电频率上运行的交通信息服务广播（TIS-B）设备的要求；并且

(2) Meets the requirements of §91.227.
符合第 91.227 节的要求。

(b) After January 1, 2020, except as prohibited in paragraph (i)(2) of this section or unless otherwise authorized by ATC, no person may operate an aircraft below 18,000 feet MSL and in airspace described in paragraph (d) of this section unless the aircraft has equipment installed that—
2020 年 1 月 1 日之后，除非本节（i）（2）禁止，或空中交通管制另有授权，否则任何人不得在本节第（d）款所述的海拔 18000 英尺以下的空域内操作飞行器，除非飞行器安装了—

(1) Meets the performance requirements in—
满足以下标准规定中所述的性能要求—
(i) TSO-C166b; or
TSO-C166b 标准规定；或
(ii) TSO-C154c, Universal Access Transceiver (UAT) Automatic Dependent Surveillance- Broadcast (ADS-B) Equipment Operating on the Frequency of 978 MHz;
TSO-C154c 标准规定，通用接入收发器（UAT）自动相关监视广播（ADS-B）设备，工作频率 978 兆赫；
(2) Meets the requirements of §91.227.
符合第 91.227 节的要求。

(c) Operators with equipment installed with an approved deviation under §21.618 of this chapter also are in compliance with this section.
根据本章第 21.618 节的规定操作经批准的非标准的设备的操作人员也应遵守本节的规定。

(d) After January 1, 2020, except as prohibited in paragraph (i)(2) of this section or unless otherwise authorized by ATC, no person may operate an aircraft in the following airspace unless the aircraft has equipment installed that meets the requirements in paragraph (b) of this section:
2020 年 1 月 1 日以后，除非本节（i）（2）禁止，或空中交通管制另有授权，任何人不得在下列空域操作飞行器，除非飞行器安装了符合本节第（b）款要求的设备：
(1) Class B and Class C airspace areas;
B 类和 C 类空域；
(2) Except as provided for in paragraph (e) of this section, within 30 nautical miles of an airport listed in appendix D, section 1 to this part from the surface upward to 10,000 feet MSL;
除本节第（e）款的规定外，在本部分附录 D 第 1 节所列机场 30 海里范围内的地面至海拔 10000 英尺；
(3) Above the ceiling and within the lateral boundaries of a Class B or Class C airspace area designated for an airport upward to 10,000 feet MSL;
在为机场指定的，最高不超过海拔 10000 英尺的，B 类或 C 类空域的最高高度以上的横向边界内；
(4) Except as provided in paragraph (e) of this section, Class E airspace within the 48 contiguous states and the District of Columbia at and above 10,000 feet MSL, excluding the airspace at and below 2,500 feet above the surface; and
除本节第（e）款规定外，本土 48 州和哥伦比亚特区内海拔 10000 英尺及以上的 E 类空域，不包括离地高度 2500 英尺及以下的空域；以及
(5) Class E airspace at and above 3,000 feet MSL over the Gulf of Mexico from the coastline of the United States out to 12 nautical miles.
美国海岸线以及海岸线 12 海里内，墨西哥湾上空海拔 3000 英尺及以上的 E 类空域。

(e) The requirements of paragraph (b) of this section do not apply to any aircraft that was not originally certificated with an electrical system, or that has not subsequently been certified with such a system installed, including balloons and gliders. These aircraft may conduct operations without ADS-B Out in the airspace specified in paragraphs (d)(2) and (d)(4) of this section. Operations authorized by this section must be conducted—
本节第（b）款的要求不适用于任何最初未获电气系统认证的，或虽然安装了此类系统，但未获得此类系统认证的飞行器，包括气球和滑翔机。这些飞行器可在本节第（d）（2）款和第（d）（4）款规定的空域内进行无 ADS-B 发射设备的运行。根据本节规定获得授权的飞行器操作只能在以下空域执行—
(1) Outside any Class B or Class C airspace area; and
在任何 B 类或 C 类空域以外；以及
(2) Below the altitude of the ceiling of a Class B or Class C airspace area designated for an airport, or 10,000 feet MSL, whichever is lower.
低于被指定用于机场的 B 类或 C 类空域的最高高度，或低于海拔 10000 英尺（以较低者为准）。

(f) Except as prohibited in paragraph (i)(2) of this section, each person operating an aircraft equipped with ADS-B Out must operate this equipment in the transmit mode at all times unless—

除非本节（i）（2）禁止，操作配备 ADS-B 发射设备的飞行器的人员必须始终在传输模式下操作该设备。除非—

(1) Otherwise authorized by the FAA when the aircraft is performing a sensitive government mission for national defense, homeland security, intelligence or law enforcement purposes and transmitting would compromise the operations security of the mission or pose a safety risk to the aircraft, crew, or people and property in the air or on the ground; or

联邦航空局对此情形另有授权：飞行器在执行政府的以国防、国土安全、情报或执法为目的的敏感任务，且信号的传输会使得任务难以安全完成，或会给飞行器、机组、空中或地面的人员和财产造成安全风险。

(2) Otherwise directed by ATC when transmitting would jeopardize the safe execution of air traffic control functions.

空中交通管制对此情形另有授权：信号的传输会破坏空中交通管制的安全运行。

(g) Requests for ATC authorized deviations from the requirements of this section must be made to the ATC facility having jurisdiction over the concerned airspace within the time periods specified as follows:

申请获得空中交通管制授权，以无需遵守本节的要求时，必须向在相关时段内对相关空域有管辖权的空中交通管制部门提交申请，具体如下：

(1) For operation of an aircraft with an inoperative ADS-B Out, to the airport of ultimate destination, including any intermediate stops, or to proceed to a place where suitable repairs can be made or both, the request may be made at any time.

对于没有可以正常运行的 ADS-B 发射设备的飞行器，当飞行器飞向目的地机场以及任何中途停留点，或前往可以进行适当维修的地点，或同时符合两种情况时，申请可以在任何时候提出。

(2) For operation of an aircraft that is not equipped with ADS-B Out, the request must be made at least 1 hour before the proposed operation.

对于没有配备 ADS-B 发射设备的飞行器，申请必须在拟进行的飞行器作业之前至少 1 小时提出。

SEC. 91.307: PARACHUTES AND PARACHUTING「降落伞和跳伞」

(a) No pilot of a civil aircraft may allow a parachute that is available for emergency use to be carried in that aircraft unless it is an approved type and—

民用飞行器的飞行员不得允许任何人在该飞行器内携带可供紧急使用的降落伞，除非降落伞是经认证的类型，并且—

(1) If a chair type (canopy in back), it has been packed by a certificated and appropriately rated parachute rigger within the preceding 180 days; or

如果是座椅式降落伞（伞置于背后），则其须在此前的 180 天内由具有适当等级的持证降落伞装备师进行过叠伞；或

(2) If any other type, it has been packed by a certificated and rated parachute rigger—

如果是其他类型的，则须由具有相应等级的持证降落伞装备师在以下时间内进行过叠伞—

(i) Within the preceding 180 days, if its canopy, shrouds, and harness are composed exclusively of nylon, rayon, or other similar synthetic fiber or materials that are substantially resistant to damage from mold, mildew, or other fungi and other rotting agents propagated in a moist environment; or

在此前 180 天内，如果其降落伞，包装布，和背带仅由尼龙、人造丝或其他类似的合成纤维或材料组成，且这些纤维或材料对在潮湿环境中传播的霉菌、霉斑或其他真菌和其他致腐物质的损害具有实质性抵抗力；或

(ii) Within the preceding 60 days, if any part of the parachute is composed of silk, pongee, or other natural fiber, or materials not specified in paragraph (a)(2) (i) of this section.

在此前 60 天内，如果降落伞的任何部分由丝绸、茧绸或其他天然纤维，或本节第（a）（2）（i）款未规定的材料组成。

(b) Except in an emergency, no pilot in command may allow, and no person may conduct, a parachute operation from an aircraft within the United States except in accordance with part 105 of this chapter.

除紧急情况外，任何机长不得允许他人在美国境内的飞行器上进行降落伞作业，任何人也不得进行此类作业，但依照本章第 105 部分规定的情况除外。

(c) Unless each occupant of the aircraft is wearing an approved parachute, no pilot of a civil aircraft carrying any person (other than a crewmember) may execute any intentional maneuver that exceeds—
除非飞行器上的每位乘客都穿着经认证的降落伞，否则载有任何人（除一名机组人员外）的民用飞行器的飞行员不得刻意进行任何以下机动—

(1) A bank of 60 degrees relative to the horizon; or
相对地平线达 60 度夹角的坡度（以机身长度为轴的倾斜角）；或

(2) A nose-up or nose-down attitude of 30 degrees relative to the horizon.
相对地平线达 30 度的俯仰角度（上下两个方向）。

(d) Paragraph (c) of this section does not apply to—
本节第（c）款不适用于—

(1) Flight tests for pilot certification or rating; or
为考取飞行员资格或等级而进行的飞行测验；或

(2) Spins and other flight maneuvers required by the regulations for any certificate or rating when given by—
由下列人士操作的，任何证书或等级的规定所要求的螺旋以及其他机动—

(i) A certificated flight instructor; or
持证飞行教官；或

(ii) An airline transport pilot instructing in accordance with Sec. 61.67 of this chapter.
遵守本章第 61.67 节规定的航空运输飞行员。

(e) For the purposes of this section, approved parachute means—
在本节中，经认证的降落伞指—

(1) A parachute manufactured under a type certificate or a technical standard order (C-23 series); or
根据型号证书或技术标准规定（C-23 系列）制造的降落伞；或

(2) A personnel-carrying military parachute identified by an NAF, AAF, or AN drawing number, an AAF order number, or any other military designation or specification number.
用于运输人员的，由 NAF、AAF，或 AN 图纸编号、AAF 订单编号，或任何其他军队指定或规格所标识的军用降落伞。

SEC. 91.403: GENERAL「概述」

(a) The owner or operator of an aircraft is primarily responsible for maintaining that aircraft in an airworthy condition, including compliance with part 39 of this chapter.
飞行器的所有者或运营者的首要责任是保持该飞行器处于适航状态，包括遵守本章第 39 部分的规定。

(b) No person may perform maintenance, preventive maintenance, or alterations on an aircraft other than as prescribed in this subpart and other applicable regulations, including part 43 of this chapter.
除本子部分和其他适用法规（包括本章第 43 部分）规定的情况外，任何人不得对飞行器进行维护、预防性维护或改装。

(c) No person may operate an aircraft for which a manufacturer's maintenance manual or instructions for continued airworthiness has been issued that contains an airworthiness limitations section unless the mandatory replacement times, inspection intervals, and related procedures specified in that section or alternative inspection intervals and related procedures set forth in an operations specification approved by the Administrator under part 121 or 135 of this chapter or in accordance with an inspection program approved under § 91.409(e) have been complied with.
任何人在未满足以下条件的情况下，不得运营已发布制造商维护手册或持续适航说明书（需包含适航限制章节）的飞行器：零件强制更换时间、飞行器检查间隔，其他适航限制章节规定的相关程序，或管理局根据本章第 121 或 135 部分批准的飞行器检查间隔、相关程序，或根据 91.409（e）款批准的检查计划。

SEC. 91.409: INSPECTIONS「检查」

(a) Except as provided in paragraph (c) of this section, no person may operate an aircraft unless, within the preceding

12 calendar months, it has had—
除本节（c）款规定外，任何人不得操作飞行器，除非在前 12 个日历月内—
(1) An annual inspection in accordance with part 43 of this chapter and has been approved for return to service by a person authorized by § 43.7 of this chapter; or
该飞行器完成了根据本章第 43 部分规定进行的年度检查，并经本章第 43.7 节授权人员批准恢复服务；或
(2) An inspection for the issuance of an airworthiness certificate in accordance with part 21 of this chapter.
该飞行器完成了按照本章第 21 部分签发适航证书的检查。
No inspection performed under paragraph (b) of this section may be substituted for any inspection required by this paragraph unless it is performed by a person authorized to perform annual inspections and is entered as an "annual" inspection in the required maintenance records.
根据本节第（b）款进行的检查不能替代本款要求的任何检查，除非其由获得授权进行年度检查的人员进行，并被作为"年度"检查记入所要求的维护记录。

(b) Except as provided in paragraph (c) of this section, no person may operate an aircraft carrying any person (other than a crewmember) for hire, and no person may give flight instruction for hire in an aircraft which that person provides, unless within the preceding 100 hours of time in service the aircraft has received an annual or 100-hour inspection and been approved for return to service in accordance with part 43 of this chapter or has received an inspection for the issuance of an airworthiness certificate in accordance with part 21 of this chapter. The 100- hour limitation may be exceeded by not more than 10 hours while en route to reach a place where the inspection can be done. The excess time used to reach a place where the inspection can be done must be included in computing the next 100 hours of time in service.
除本节（c）款规定外，任何人不得经营载有任何人（一名机组人员除外）的供出租的飞行器，任何人不得在其提供的飞行器上发出出租提示，除非在飞行器的前 100 小时服务时间内已接受年度检查或 100 小时检查，并根据本章第 43 部分规定获批恢复服务，或完成了按照本章第 21 部分签发适航证书的检查。在前往检查地点的途中，最多不得超过 100 小时限制 10 小时以上。在计算下一个 100 小时的使用时间时，必须包括用于到达检查地点的多余时间。

(c) Paragraphs (a) and (b) of this section do not apply to—
本节第（a）和（b）款不适用于—
(1) An aircraft that carries a special flight permit, a current experimental certificate, or a light-sport or provisional airworthiness certificate;
持有特别飞行许可、有效期内的试验证书、轻型运动或临时适航证书的飞行器；
(2) An aircraft inspected in accordance with an approved aircraft inspection program under part 125 or 135 of this chapter and so identified by the registration number in the operations specifications of the certificate holder having the approved inspection program;
按照本章第 125 部分或第 135 部分规定的经批准的飞行器检查计划进行检查，并由具有经批准的检查计划的证书持有人的操作规范中的注册号进行识别的飞行器；
(3) An aircraft subject to the requirements of paragraph (d) or (e) of this section; or
符合本节第（d）或（e）款要求的飞行器；或
(4) Turbine-powered rotorcraft when the operator elects to inspect that rotorcraft in accordance with paragraph (e) of this section.
涡轮动力旋翼机，当运营商选择按照本节第（e）款检查该旋翼机时。

(d) Progressive inspection. Each registered owner or operator of an aircraft desiring to use a progressive inspection program must submit a written request to the responsible Flight Standards office, and shall provide—
渐进式检查。飞行器的注册所有者或经营者如欲使用渐进式检查程序，必须向负责管理的飞行标准办公室提交书面申请，并须提供—
(1) A certificated mechanic holding an inspection authorization, a certificated airframe repair station, or the manufacturer of the aircraft to supervise or conduct the progressive inspection;
由检验授权的持证机械师、获认证的机身修理站或飞行器制造商监督渐进式检查或进行渐进式检查；

(2) A current inspection procedures manual available and readily understandable to pilot and maintenance personnel containing, in detail—
最新检查程序手册，该手册应易于飞行员和维修人员获得和理解，其中内容详细包括—
(i) An explanation of the progressive inspection, including the continuity of inspection responsibility, the making of reports, and the keeping of records and technical reference material;
对渐进式检查的说明，包括检查责任的连续性、报告的编制、记录和技术参考资料的保存；
(ii) An inspection schedule, specifying the intervals in hours or days when routine and detailed inspections will be performed and including instructions for exceeding an inspection interval by not more than 10 hours while en route and for changing an inspection interval because of service experience;
检查时间表，具体细化进行例行详细检查的时间间隔（以小时或天数为单位），并包括在飞行过程中超过检查间隔不超过 10 小时的相关指导，以及因服务经验而更改检查间隔的相关指导；
(iii) Sample routine and detailed inspection forms and instructions for their use; and
例行详细检查的表格的示例和使用说明；以及
(iv) Sample reports and records and instructions for their use;
报告、记录的示例和使用说明；
(3) Enough housing and equipment for necessary disassembly and proper inspection of the aircraft; and
足够的空间和设备，以便对飞行器进行必要的拆卸和适当的检查
(4) Appropriate current technical information for the aircraft.
适用于飞行器的最新技术信息。

The frequency and detail of the progressive inspection shall provide for the complete inspection of the aircraft within each 12 calendar months and be consistent with the manufacturer's recommendations, field service experience, and the kind of operation in which the aircraft is engaged. The progressive inspection schedule must ensure that the aircraft, at all times, will be airworthy and will conform to all applicable FAA aircraft specifications, type certificate data sheets, airworthiness directives, and other approved data. If the progressive inspection is discontinued, the owner or operator shall immediately notify the responsible Flight Standards office, in writing, of the discontinuance.
渐进式检查的频率和细节应作为对每 12 个日历月的飞行器全面检查的准备，并应符合制造商建议、现场服务经验和飞行器运营类型。渐进式检查计划表必须确保飞行器在任何时候都是适航的，并符合所有适用的联邦航空局飞行器规范、型号证书数据表、适航指令和其他批准的数据。如果渐进式检查被中止，飞行器所有者或经营者应立即以书面形式将检查中止通知负责管理的飞行标准办公室。

(e) Large airplanes (to which part 125 is not applicable), turbojet multiengine airplanes, turbopropeller-powered multiengine airplanes, and turbine-powered rotorcraft. No person may operate a large airplane, turbojet multiengine airplane, turbopropeller-powered multiengine airplane, or turbine-powered rotorcraft unless the replacement times for life-limited parts specified in the aircraft specifications, type data sheets, or other documents approved by the Administrator are complied with and the airplane or turbine-powered rotorcraft, including the airframe, engines, propellers, rotors, appliances, survival equipment, and emergency equipment, is inspected in accordance with an inspection program selected under the provisions of paragraph (f) of this section, except that, the owner or operator of a turbine-powered rotorcraft may elect to use the inspection provisions of § 91.409(a), (b), (c), or (d) in lieu of an inspection option of § 91.409(f).
大型飞机（不适用于第 125 部分规定）、涡轮喷气多引擎飞机、涡轮螺旋桨多引擎飞机和涡轮动力旋翼机：任何人不得操作大型飞机、涡轮喷气多引擎飞机、涡轮螺旋桨多引擎飞机或涡轮动力旋翼机，除非飞行器规格、型号数据表或管理局认证的其他文件中，有关有限寿命零件更换时间的规定得到遵守。并且这些飞机或涡轮动力旋翼机的机身、发动机、螺旋桨、转子、装置、救生设备和应急设备，按照本节第（f）款规定的检查程序进行了检查。但是，涡轮动力旋翼机的所有者或经营者可选择使用 91.409（a），（b），（c）或（d）款的检查条款代替第 91.409（f）条的检查选项。
(f) Selection of inspection program under paragraph (e) of this section. The registered owner or operator of each

airplane or turbine-powered rotorcraft described in paragraph (e) of this section must select, identify in the aircraft maintenance records, and use one of the following programs for the inspection of the aircraft:
根据本节第（e）款选择检查方案：本节第（e）款所述飞机或涡轮动力旋翼机的注册所有者或经营者必须在飞机维修记录中选择、标明并使用下列方案之一对飞行器进行检查：

(1) A continuous airworthiness inspection program that is part of a continuous airworthiness maintenance program currently in use by a person holding an air carrier operating certificate or an operating certificate issued under part 121 or 135 of this chapter and operating that make and model aircraft under part 121 of this chapter or operating that make and model under part 135 of this chapter and maintaining it under § 135.411(a)(2) of this chapter.
连续性的适航检查计划，且检查计划是航空器营运证书持有人或依本章第 121 或 135 部分签发的营运证书的持有人目前正在使用的、连续性适航维护计划的一部分，且证书持有人根据本章第 121 部分规定运营该品牌和型号的飞行器，或根据本章第 135 部分规定运营该品牌和型号的飞行器，并根据本章第 135.411（a）（2）对其进行维护。

(2) An approved aircraft inspection program approved under § 135.419 of this chapter and currently in use by a person holding an operating certificate issued under part 135 of this chapter.
根据本章第 135.419 节认证的飞行器检查计划，且检查计划目前由持有根据本章第 135 部分规定签发的营运证书的人员使用。

(3) A current inspection program recommended by the manufacturer.
制造商建议的最新检查程序。

(4) Any other inspection program established by the registered owner or operator of that airplane or turbine-powered rotorcraft and approved by the Administrator under paragraph (g) of this section. However, the Administrator may require revision of this inspection program in accordance with the provisions of § 91.415.
任何其他由该飞机或涡轮动力旋翼机的注册所有者或经营者制定的、并经管理局根据本节第（g）款批准的检查计划。但是，管理局可要求根据第 91.415 节的规定修订该检查计划。

Each operator shall include in the selected program the name and address of the person responsible for scheduling the inspections required by the program and make a copy of that program available to the person performing inspections on the aircraft and, upon request, to the Administrator.
运营商在选定的检查方案中应说明负责安排方案所要求的检查的人员的姓名和地址，并将该方案的副本提供给对飞行器进行检查的人员，并应要求提供给管理局。

(g) Inspection program approved under paragraph (e) of this section. Each operator of an airplane or turbine-powered rotorcraft desiring to establish or change an approved inspection program under paragraph (f) (4) of this section must submit the program for approval to the responsible Flight Standards office. The program must be in writing and include at least the following information:
根据本节第（e）款批准的检查计划：飞机或涡轮动力旋翼机的运营商，如果希望根据本节第（f）（4）款建立或更改经批准的检查计划，必须将该计划提交给负责管理的飞行标准办公室批准。检查计划必须是书面的，并且至少包含以下信息：

(1) Instructions and procedures for the conduct of inspections for the particular make and model airplane or turbine-powered rotorcraft, including necessary tests and checks. The instructions and procedures must set forth in detail the parts and areas of the airframe, engines, propellers, rotors, and appliances, including survival and emergency equipment required to be inspected.
对特定品牌和型号的飞机或涡轮动力旋翼机进行检查的说明和流程，包括必要的测试和检查。说明内容和流程必须详细说明机身、发动机、螺旋桨、转子和设备的零件和区域，包括需要检查的救生和应急设备。

(2) A schedule for performing the inspections that must be performed under the program expressed in terms of the time in service, calendar time, number of system operations, or any combination of these.
必须在检查计划内执行的检查时间表，该时间表应以飞行器服务时间、日历时间、系统运行次数或它们的组

合为单位。

(h) Changes from one inspection program to another. When an operator changes from one inspection program under paragraph (f) of this section to another, the time in service, calendar times, or cycles of operation accumulated under the previous program must be applied in determining inspection due times under the new program.
检查方案的更换：当运营者从本节第（f）款规定的一个检验计划变更为另一个检验计划时，在确定新计划下的检验到期时间时，必须采用前一个计划下累积的运行时间、日历时间或运行周期。

PART 105—PARACHUTE OPERATIONS「降落伞作业」

SEC. 105.1: APPLICABILITY「适用性」

(a) Except as provided in paragraphs (b) and (c) of this section, this part prescribes rules governing parachute operations conducted in the United States.
除本节第（b）和（c）款规定外，本部分规定了在美国进行降落伞作业的规则。

(b) This part does not apply to a parachute operation conducted—
本部分不适用于以下情况的降落伞作业—

(1) In response to an in-flight emergency, or
飞行中的紧急情况的应对，或

(2) To meet an emergency on the surface when it is conducted at the direction or with the approval of an agency of the United States, or of a State, Puerto Rico, the District of Columbia, or a possession of the United States, or an agency or political subdivision thereof.
在美国或美国各州、波多黎各、哥伦比亚特区或美国属地或其机构或政治分支机构的指示或批准下，对地面紧急情况的应对。

(c) Sections 105.5, 105.9, 105.13, 105.15, 105.17, 105.19 through 105.23, 105.25(a) (1) and 105.27 of this part do not apply to a parachute operation conducted by a member of an Armed Force—
本部分 105.5、105.9、105.13、105.15、105.17、105.19 至 105.23、105.25（a）（1）及 105.27 不适用于军队成员在以下区域进行的降落伞作业—

(1) Over or within a restricted area when that area is under the control of an Armed Force.
在受军队管制的限制区之上或之内。

(2) During military operations in uncontrolled airspace.
在非管制空域的军事行动中。

SEC. 105.3: DEFINITIONS「定义」

For the purposes of this part—
就本部分而言，以下词汇的定义如下—

APPROVED PARACHUTE means a parachute manufactured under a type certificate or a Technical Standard Order (C-23 series), or a personnel-carrying U.S. military parachute (other than a high altitude, high speed, or ejection type) identified by a Navy Air Facility, an Army Air Field, and Air Force-Navy drawing number, an Army Air Field order number, or any other military designation or specification number.
经批准的降落伞：指根据型号证书或 TSO C-23 系列标准制造的降落伞，或由海军航空设施、陆军航空机场识别的携带人员的美国军用降落伞（高空、高速或弹射类型除外），以及空军-海军、陆军-空军图纸编号或任何其他军用指定或规格编号的降落伞。

AUTOMATIC ACTIVATION DEVICE means 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.
自动激活装置（AAD）：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。

DIRECT SUPERVISION means that 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.
直接监督：持证装备师（Rigger）亲自监督未持证人员叠主降落伞，以确保其正确操作，并对该次叠伞负责。

DROP ZONE means 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.
降落区（DZ）：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。

FOREIGN PARACHUTIST means a parachutist who is neither a U.S. citizen or a resident alien and is participating in parachute operations within the United States using parachute equipment not manufactured in the United States.
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。

FREEFALL means 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.
自由落体：出舱和降落伞打开之间的阶段，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。

MAIN PARACHUTE means a parachute worn as the primary parachute used or intended to be used in conjunction with a reserve 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。

OBJECT means 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.
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。

PARACHUTE DROP means 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.
（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。

PARACHUTE JUMP means a parachute operation that involves the descent of one or more persons to the surface from an aircraft in flight when an aircraft is used or intended to be used during all or part of that descent.
（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，人员从飞行器上落到地面的降落伞作业。

**editor's note: It is assumed that the FAA intended to say "... from an aircraft in flight when a parachute is used or intended to be used during all or part of that descent."*

**编者提示：一般假定，联邦航空局意在表述“……在飞行中的飞行器上落下的，在整个或部分下降过程中使用或计划使用降落伞的。*

PARACHUTE OPERATION means 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, jump master, certificated parachute rigger, or pilot.
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。

PARACHUTIST means a person who intends to exit an aircraft while in flight using a single-harness, dual parachute system to descend to the surface.
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。

PARACHUTIST IN COMMAND means the person responsible for the operation and safety of a tandem parachute operation.
双人伞指挥员：指对双人伞作业的操作和安全负责的人。

PASSENGER PARACHUTIST means a person who boards an aircraft, acting as other than the parachutist in command of a tandem parachute operation, with the intent of exiting [sic] the aircraft while in-flight using the forward harness of a dual harness tandem parachute system to descend to the surface.
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。

PILOT CHUTE means a small parachute used to initiate and/or accelerate deployment of a main or reserve parachute.
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。

RAM-AIR PARACHUTE means 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.
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。

RESERVE PARACHUTE means 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.
备用降落伞：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。

SINGLE-HARNESS, DUAL PARACHUTE SYSTEM means 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.
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。

TANDEM PARACHUTE OPERATION means 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.
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。

TANDEM PARACHUTE SYSTEM means 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.
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。

SEC. 105.5: GENERAL「概述」

No person may conduct a parachute operation, and no pilot in command of an aircraft may allow a parachute operation to be conducted from an aircraft, if that operation creates a hazard to air traffic or to persons or property on the surface.
如果降落伞作业会对空中交通或地面上的人员或财产造成危险，则任何人不得进行降落伞作业，飞行器的机长也不得允许他人在飞行器上进行降落伞作业。

SEC. 105.7: USE OF ALCOHOL AND DRUGS「酒精和药物的使用」

No person may conduct a parachute operation, and no pilot in command of an aircraft may allow a person to conduct a parachute operation from that aircraft, if that person is or appears to be under the influence of—
如有人员正在或似乎正受以下物质的影响，那么他不得进行降落伞作业，飞行器的机长也不得容许该名人员进行降落伞作业—
(a) Alcohol, or
酒精，或
(b) Any drug that affects that person's faculties in any way contrary to safety.
任何以影响安全的方式影响人体官能的药物。

SEC. 105.9: INSPECTIONS「检查」

The Administrator may inspect any parachute operation to which this part applies (including inspections at the site where the parachute operation is being conducted) to determine compliance with the regulations of this part.
管理局可检查本部分所适用的任何降落伞作业（包括在进行降落伞作业的地点进行的检查），以确定是否符合本部分的规定。

SEC. 105.13: RADIO EQUIPMENT AND USE REQUIREMENTS「无线电设备和使用要求」

(a) Except when otherwise authorized by air traffic control-
除非空中交通管制另有授权—
(1) No person may conduct a parachute operation, and no pilot in command of an aircraft may allow a parachute operation to be conducted from that aircraft, in or into controlled airspace unless, during that flight-
除非在飞行期间满足以下条件，任何人不得进行管制空域内的（或进入管制空域的）降落伞作业，任何飞行器的机长不得允许在该飞行器上进行这类降落伞作业—
(i) The aircraft is equipped with a functioning two-way radio communication system appropriate to the air traffic control facilities being used; and
飞行器配备的双向无线电通信系统与空中交通管制部门使用的双向无线电通信系统相匹配
(ii) Radio communications have been established between the aircraft and the air traffic control facility having jurisdiction over the affected airspace of the first intended exit altitude at least 5 minutes before the parachute operation begins. The pilot in command must establish radio communications to receive information regarding air traffic activity in the vicinity of the parachute operation.
在降落伞作业开始前至少 5 分钟，飞行器与空中交通管制部门之间建立了无线电通信，该空管部门是对第一次预定离机高度的空域具有管辖权的空管部门。机长必须建立无线电通信，以接收降落伞作业附近空中交通活动的信息。
(2) The pilot in command of an aircraft used for any parachute operation in or into controlled airspace must, during

each flight—
在每次飞行中，在管制空域内或进入管制空域内进行任何降落伞作业的飞行器的机长必须—

(i) Continuously monitor the appropriate frequency of the aircraft's radio communications system from the time radio communications are first established between the aircraft and air traffic control, until the pilot advises air traffic control that the parachute operation has ended for that flight.
从飞行器和空中交通管制之间首次建立无线电通信开始，到飞行员通知空中交通管制该飞行的降落伞操作已经结束期间，持续监控飞行器无线电通信系统的适当频率。

(ii) Advise air traffic control when the last parachutist or object leaves the aircraft.
当最后一名跳伞者或空投物离开飞行器时，通知空中交通管制。

(b) Parachute operations must be aborted if, prior to receipt of a required air traffic control authorization, or during any parachute operation in or into controlled airspace, the required radio communications system is or becomes inoperative.
如果在收到所需的空中交通管制授权之前，或在管制空域内的（或进入管制空域的）降落伞作业过程中，所需的无线电通信系统失效，则降落伞作业必须中止。

SEC. 105.15: INFORMATION REQUIRED AND NOTICE OF CANCELLATION OR POSTPONEMENT OF A PARACHUTE OPERATION「必要信息，以及取消或推迟降落伞作业的通知」

(a) Each person requesting an authorization under Secs. 105.21(b) and 105.25(a)(2) of this part and each person submitting a notification under Sec. 105.25(a)(3) of this part must provide the following information (on an individual or group basis):
每名根据本部分 105.21（b）及 105.25（a）（2）申请授权的人士，以及每名根据本部分 105.25（a）（3）提交通知的人士，必须提供下列资料（以个人或团体为单位提供）：

(1) The date and time the parachute operation will begin.
降落伞作业开始的日期和时间。

(2) The radius of the drop zone around the target expressed in nautical miles.
以着陆目标为中心的降落区半径，单位为海里。

(3) The location of the center of the drop zone in relation to—
降落区中心位置相对于—

(i) The nearest VOR facility in terms of the VOR radial on which it is located and its distance in nautical miles from the VOR facility when that facility is 30 nautical miles or less from the drop zone target; or
最近的甚高频全向无线电信标（VOR）的距离，以降落区中心所处于的 VOR 径向线和距离（海里为单位）表示（当降落区中心与最近的 VOR 的距离小于或等于 30 海里时）；或者

(ii) 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 target.
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（当降落区中心与最近的 VOR 的距离超过 30 海里时）。

(4) Each altitude above mean sea level at which the aircraft will be operated when parachutists or objects exit the aircraft.
每个跳伞者或空投物离开飞行器时，飞行器的海拔高度。

(5) The duration of the intended parachute operation.
预定的降落伞作业持续时间。

(6) The name, address, and telephone number of the person who requests the authorization or gives notice of the parachute operation.
申请授权或发出降落伞作业通知的人的姓名、地址和电话号码。

(7) The registration number of the aircraft to be used.
所使用的飞行器的注册号。

(8) The name of the air traffic control facility with jurisdiction of the airspace at the first intended exit altitude to be used for the parachute operation.
空管部门的名称，该空管部门对降落伞作业的第一次预定离机高度所处的空域具有管辖权。

(b) Each holder of a certificate of authorization issued under Secs. 105.21(b) and 105.25(b) of this part must present that certificate for inspection upon the request of the Administrator or any Federal, State, or local official.
凡根据本部分第 105.21（b）及 105.25（b）条规定获得授权的人士，均须在受到管理局或任何联邦、州或地方官员的要求时，出示相关授权书以供查阅。

(c) Each person requesting an authorization under Secs. 105.21(b) and 105.25(a)(2) of this part and each person submitting a notice under Sec. 105.25(a)(3) of this part must promptly notify the air traffic control facility having jurisdiction over the affected airspace if the proposed or scheduled parachute operation is canceled or postponed.
根据本部分 105.21（b）和 105.25（a）（2）款规定申请授权的个人，以及根据 105.25（a）（3）款规定提交通知的个人，在拟进行的或计划的降落伞作业被取消或推迟时，必须立即通知对受影响空域具有管辖权的空中交通管制部门。

SEC. 105.17: FLIGHT VISIBILITY AND CLEARANCE FROM CLOUD REQUIREMENTS「飞行能见度和云层净空要求」

No person may conduct a parachute operation, and no pilot in command of an aircraft may allow a parachute operation to be conducted from that aircraft—
在以下情况中，任何人不得进行降落伞作业，飞行器的飞行员也不得允许在该飞行器上进行降落伞作业—

(a) Into or through a cloud, or
进入或穿过云层时，或者

(b) When the flight visibility or the distance from any cloud is less than that prescribed in the following table:
当飞行能见度或与任何云层的距离小于下表规定值时：

Altitude 高度	**Flight Visibility 飞行能见度**	**Distance From Clouds 与云的距离**	
(1) 1,200 feet or less above the surface regardless of MSL altitude. 离地 1, 200 英尺或以下，无论海拔高度是多少	3 statute mile 3 法定英里	500 feet below. 1,000 feet above. 2,000 feet horizontal.	云以下：500 英尺 云以上：1, 000 英尺 水平距离：2, 000 英尺
(2) More than 1,200 feet above the surface but less than 10,000 feet 离地 1, 200 英尺以上，但低于海拔 10, 000 英尺	3 statute mile 3 法定英里	500 feet below. 1,000 feet above. 2,000 feet horizontal.	云以下：500 英尺 云以上：1, 000 英尺 水平距离：2, 000 英尺
(3) More than 1,200 feet above the surface and at or above 10,000 离地 1, 200 英尺以上，且高于海拔 10, 000 英尺。	5 statute mile 5 法定英里	1,000 feet below 1,000 feet above. 1 statute mile horizontal.	云以下：1, 000 英尺 云以上：1, 000 英尺 水平距离：1 法定英里

SEC. 105.19: PARACHUTE OPERATIONS BETWEEN SUNSET AND SUNRISE「日落至日出之间的降落伞作业」

(a) No person may conduct a parachute operation, and no pilot in command of an aircraft may allow a person to conduct a parachute operation from an aircraft between sunset and sunrise, unless the person or object descending from the aircraft displays a light that is visible for at least 3 statute miles.
除非从飞行器上伞降落下的人或空投物配有至少 3 法定英里内可见的信号灯，在日落至日出之间，任何人不得进行降落伞作业，飞行器的飞行员也不得允许在其飞行器上进行降落伞作业。

(b) The light required by paragraph (a) of this section must be displayed from the time that the person or object is under a properly functioning open parachute until that person or object reaches the surface.
本节第（a）款所要求的信号灯，必须从降落伞正常打开工作时起到落地为止一直保持打开。

SEC. 105.21: PARACHUTE OPERATIONS OVER OR INTO A CONGESTED AREA OR AN OPEN-AIR ASSEMBLY OF PERSONS「在拥挤区域或露天人员集会上空进行的，或进入这些区域的降落伞作业」

(a) No person may conduct a parachute operation, and no pilot in command of an aircraft may allow a parachute operation to be conducted from that aircraft, over or into a congested area of a city, town, or settlement, or an open-air assembly of persons unless a certificate of authorization for that parachute operation has been issued under this section. However, a parachutist may drift over a congested area or an open-air assembly of persons with a fully deployed and properly functioning parachute if that parachutist is at a sufficient altitude to avoid creating a hazard to persons or property on the surface.
在飞越或进入城市、城镇或居民点的拥挤区域或露天人员集会区域时，任何人不得进行降落伞作业，飞行器的飞行员也不得允许在其飞行器上进行降落伞作业，除非获得已根据本节规定发出的降落伞作业授权证书。但是，如果开伞后跳伞者的高度足够高，足以避免对地面人员或财产造成危害，则跳伞者可以在拥挤区域或露天人员集会的上空操作完全打开且功能正常的降落伞进行移动。

(b) An application for a certificate of authorization issued under this section must—
根据本节签发的授权证书申请必须—
(1) Be made in the form and manner prescribed by the Administrator, and
以管理局规定的形式和方式制作，以及
(2) Contain the information required in Sec. 105.15(a) of this part.
包含本部分 105.15（a）规定所需的信息。

(c) Each holder of, and each person named as a participant in a certificate of authorization issued under this section must comply with all requirements contained in the certificate of authorization.
根据本节规定获得授权证书的持有人，以及被指定为参与者的人必须遵守授权证书中包含的所有要求。

(d) Each holder of a certificate of authorization issued under this section must present that certificate for inspection upon the request of the Administrator, or any Federal, State, or local official.
在受到管理局或任何联邦、州或地方官员要求时，根据本节规定获得授权的人必须出示授权证书，以便进行检查。

SEC. 105.23: PARACHUTE OPERATIONS OVER OR ONTO AIRPORTS「机场上空或进入机场上空的降落伞作业」

No person may conduct a parachute operation, and no pilot in command of an aircraft may allow a parachute operation to be conducted from that aircraft, over or onto any airport unless—
在任何机场上空或机场内，任何人都不得进行降落伞作业，飞行器的飞行员也不得允许在其飞行器上进行降落伞作业，除非满足以下条件—

(a) For airports with an operating control tower:
对于有正常运行的塔台的机场：
(1) Prior approval has been obtained from the management of the airport to conduct parachute operations over or on that airport.
事先经机场管理部门批准，在机场上空或者机场内进行降落伞作业。
(2) Approval has been obtained from the control tower to conduct parachute operations over or onto that airport.
经塔台批准，在机场上空或者机场内进行降落伞作业。
(3) Two-way radio communications are maintained between the pilot of the aircraft involved in the parachute operation and the control tower of the airport over or onto which the parachute operation is being conducted.
参与降落伞作业的飞行器飞行员与进行降落伞作业的机场塔台之间保持双向无线电通信。

(b) For airports without an operating control tower, prior approval has been obtained from the management of the airport to conduct parachute operations over or on that airport.
对于没有运行中的塔台的机场，应事先已获得机场管理层的批准可在该机场上空或机场内进行降落伞操作。

(c) A parachutist may drift over that airport with a fully deployed and properly functioning parachute if the parachutist is at least 2,000 feet above that airport's traffic pattern, and avoids creating a hazard to air traffic or to persons and property on the ground.

如果跳伞者在机场的飞机起落航线上方至少 2000 英尺处，则跳伞者可以操纵完全打开且正常的降落伞在机场上空飞行，并应避免对空中交通或地面人员和财产造成危害。

SEC. 105.25: PARACHUTE OPERATIONS IN DESIGNATED AIRSPACE「指定空域的降落伞作业」

(a) No person may conduct a parachute operation, and no pilot in command of an aircraft may allow a parachute operation to be conducted from that aircraft—
在以下情况中，任何人不得进行降落伞作业，飞行器的飞行员也不得允许在其飞行器上进行降落伞作业—

(1) Over or within a restricted area or prohibited area unless the controlling agency of the area concerned has authorized that parachute operation;
在限制区或禁区的上空或区域内，除非有关区域的管理机构已授权进行降落伞作业；

(2) Within or into a Class A, B, C, D airspace area without, or in violation of the requirements of, an air traffic control authorization issued under this section;
在未经空中交通管制授权，或违反根据本节签发的空中交通管制授权的情况下，在 A、B、C、D 类空域内或进入这些空域进行降落伞作业；

(3) Except as provided in paragraph (c) and (d) of this section, within or into Class E or G airspace area unless the air traffic control facility having jurisdiction over the airspace at the first intended exit altitude is notified of the parachute operation no earlier than 24 hours before or no later than 1 hour before the parachute operation begins.
除本节第（c）和（d）款的规定外，在 E 或 G 类空域内或进入这些空域进行降落伞作业，除非对第一次预定离机高度所处空域具有管辖权的空中交通管制部门在降落伞作业开始 24 小时之内或不迟于作业开始 1 小时前接到降落伞作业的通知。

(b) Each request for a parachute operation authorization or notification required under this section must be submitted to the air traffic control facility having jurisdiction over the airspace at the first intended exit altitude and must include the information prescribed by Sec. 105.15(a) of this part.
根据本节规定申请的降落伞作业授权书或通知都必须提交给对第一次预定离机高度的空域具有管辖权的空中交通管制部门，并且必须包括本部分 105.15（a）规定的信息。

(c) For the purposes of paragraph (a)(3) of this section, air traffic control facilities may accept a written notification from an organization that conducts parachute operations and lists the scheduled series of parachute operations to be conducted over a stated period of time not longer than 12 calendar months. The notification must contain the information prescribed by Sec. 105.15(a) of this part, identify the responsible persons associated with that parachute operation, and be submitted at least 15 days, but not more than 30 days, before the parachute operation begins. The FAA may revoke the acceptance of the notification for any failure of the organization conducting the parachute operations to comply with its requirements.
就本节（a）（3）款而言，空中交通管制部门可接受进行降落伞作业的机构发出书面通知，并列出不超过 12 个日历月内的预定降落伞作业。通知必须包含本部分 105.15（a）规定的信息，指明降落伞作业的负责人，并在降落伞作业开始前至少 15 天但不超过 30 天内提交。如果执行降落伞作业的机构未能遵守要求，联邦航空局可撤销对通知的认可。

(d) Paragraph (a)(3) of this section does not apply to a parachute operation conducted by a member of an Armed Force within a restricted area that extends upward from the surface when that area is under the control of an Armed Force.
当某个限制区是处于军队管制下时，本节（a）（3）款不适用于军队成员在限制区内和限制区上空进行的降落伞作业。

SEC. 105.41: APPLICABILITY「适用性」

This subpart prescribed rules governing parachute equipment used in civil parachute operations.
本子部分规定了民用降落伞作业中使用的降落伞设备的管理规则。

SEC. 105.43: USE OF SINGLE-HARNESS, DUAL-PARACHUTE SYSTEMS「单背带双降落伞系统的使用」

No person may conduct a parachute operation using a single-harness, dual- parachute system, and no pilot in command of an aircraft may allow any person to conduct a parachute operation from that aircraft using a single-harness, dual-parachute system, unless that system has at least one main parachute, one approved reserve parachute, and one approved single person harness and container that are packed as follows:

任何人不得使用单背带双降落伞系统进行降落伞作业，飞行器的机长不得允许任何人使用单背带双降落伞系统在该飞行器上进行降落伞作业，除非该降落伞系统至少有一个主降落伞、一个经认证的备用降落伞，以及一个认证的单人背带和伞包，且降落伞的叠伞符合以下条件：

(a) The main parachute must have been packed within 180 days before the date of its use by a certificated parachute rigger, the person making the next jump with that parachute, or a non-certificated person under the direct supervision of a certificated parachute rigger.

主降落伞必须在使用之日前 180 天内由持证降落伞装备师，或使用该降落伞进行下一次跳伞的人，或在持证降落伞装备师直接监督下的非持证人员进行叠伞。

(b) The reserve parachute must have been packed by a certificated parachute rigger—

备用降落伞必须由持证降落伞装备师在以下时间内进行叠伞—

(1) Within 180 days before the date of its use, if its canopy, shroud, and harness are composed exclusively of nylon, rayon, or similar synthetic fiber or material that is substantially resistant to damage from mold, mildew, and other fungi, and other rotting agents propagated in a moist environment; or

在此前 180 天内，如果其降落伞，包装布，和背带仅由尼龙、人造丝或其他类似的合成纤维或材料组成，且这些纤维或材料对在潮湿环境中传播的霉菌、霉斑或其他真菌和其他致腐物质的损害具有实质性抵抗力；或

(2) Within 60 days before the date of its use, if it is composed of any amount of silk, pongee, or other natural fiber, or material not specified in paragraph (b)(1) of this section.

在此前 60 天内，如果降落伞的任何部分由丝绸、茧绸或其他天然纤维，或本节第（b）（1）款未规定的材料组成。

(c) If installed, the automatic activation device must be maintained in accordance with manufacturer instructions for that automatic activation device.

如果安装了自动激活装置（AAD），则必须按照制造商说明对其进行维护。

SEC. 105.45: USE OF TANDEM PARACHUTE SYSTEMS「双人伞系统的使用」

(a) No person may conduct a parachute operation using a tandem parachute system, and no pilot in command of an aircraft may allow any person to conduct a parachute operation from that aircraft using a tandem parachute system, unless—

除非满足以下条件，任何人不得使用双人伞系统进行降落伞作业，飞行器的机长不得允许任何人使用双人伞系统在该飞行器进行降落伞作业—

(1) One of the parachutists using the tandem parachute system is the parachutist in command, and meets the following requirements:

使用双人伞系统的其中一名跳伞者是双人伞指挥员，并满足以下要求：

(i) Has a minimum of 3 years of experience in parachuting, and must provide documentation that the parachutist—

有至少 3 年的跳伞经验，且必须提供相关文件证明该跳伞者—

(ii) Has completed a minimum of 500 freefall parachute jumps using a ram-air parachute, and

已使用冲压空气式降落伞完成至少 500 次自由落体跳伞，以及

(iii) Holds a master parachute license issued by an organization recognized by the FAA, and

持有联邦航空局认可的组织机构签发的高级跳伞执照，以及

(iv) Has successfully completed a tandem instructor course given by the manufacturer of the tandem parachute system used in the parachute operation or a course acceptable to the Administrator.

已成功完成由降落伞作业中使用中的双人伞系统的制造商提供的双人伞教练课程，或管理局认可的课程。

(v) Has 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.
已获得适当的降落伞制造商或双人伞课程提供商的认证，证明其已完成该特定双人伞系统的培训。

(2) The person acting as parachutist in command:「作为双人伞指挥员的人」

(i) Has briefed the passenger parachutist before boarding the aircraft. The briefing must include the procedures to be used in case of an emergency with the aircraft or after exiting the aircraft, while preparing to exit and exiting the aircraft, freefall, operating the parachute after freefall, landing approach, and landing.
在登机前已经向乘客做了简报。简报内容必须包括飞行器紧急情况下或出舱后，准备出舱时和出舱时、自由落体时、自由落体后操作降落伞、着陆进近和着陆时的流程。

(ii) Uses the harness position prescribed by the manufacturer of the tandem parachute equipment.
使用双人伞装备制造商规定的背带位置。

(b) No person may make a parachute jump with a tandem parachute system unless—
任何人不得使用双人伞系统跳伞，除非—

(1) The main parachute has been packed by a certificated parachute rigger, the parachutist in command making the next jump with that parachute, or a person under the direct supervision of a certificated parachute rigger.
主降落伞已由持证降落伞装备师、使用该降落伞进行下一次跳伞的降落伞指挥员，或在持证降落伞装备师直接监督下的人员进行叠伞。

(2) The reserve parachute has been packed by a certificated parachute rigger in accordance with Sec. 105.43(b) of this part.
根据本部分 105.43（b）的规定，备用降落伞已由持证降落伞装备师进行叠伞。

(3) The tandem parachute system contains an operational automatic activation device for the reserve parachute, approved by the manufacturer of that tandem parachute system. The device must—
双人伞系统须包含可正常运行的备用降落伞自动激活装置（AAD），且该 AAD 获得了双人伞系统的制造商的批准。该 AAD 必须—

(i) Have been maintained in accordance with manufacturer instructions, and
已按照制造商说明进行维护，以及

(ii) Be armed during each tandem parachute operation.
在每次双人伞作业期间都要启动。

(4) The passenger parachutist is provided with a manual main parachute activation device and instructed on the use of that device, if required by the owner/ operator.
如果双人伞系统的所有者或运营商有要求，双人伞乘员应可使用主降落伞的手动启动装置。

(5) The main parachute is equipped with a single-point release system.
主降落伞装有单点释放系统（“单点”意即单个把手可释放两个组提带）。

(6) The reserve parachute meets Technical Standard Order C23 specifications.
备用降落伞符合技术标准规定（TSO）C23 规范。

SEC. 105.47: USE OF STATIC LINES「STATIC LINES 的使用」

(a) Except as provided in paragraph (c) of this section, no person may conduct a parachute operation using a static line attached to the aircraft and the main parachute unless an assist device, described and attached as follows, is used to aid the pilot chute in performing its function, or, if no pilot chute is used, to aid in the direct deployment of the main parachute canopy. The assist device must—
除本节（c）款规定外，任何人不得使用附连在飞行器和主降落伞上的 Static Line 进行降落伞作业，除非有辅助装置协助引导伞执行其功能，或者在没有使用引导伞的情况下，辅助装置协助主降落伞直接打开。该辅助装置必须符合以下条件—

(1) Be long enough to allow the main parachute container to open before a load is placed on the device.
须足够长，以在负载放在装置上之前，有足够长度让主降落伞伞包打开。

(2) Have a static load strength of—

静载强度为—

(i) At least 28 pounds but not more than 160 pounds if it is used to aid the pilot chute in performing its function; or

如果用于协助引导伞执行其功能，则至少为 28 磅，但不超过 160 磅；或

(ii) At least 56 pounds but not more than 320 pounds if it is used to aid in the direct deployment of the main parachute canopy; and

如果用于协助主降落伞直接打开，则至少为 56 磅，但不超过 320 磅；并且

(3) Be attached as follows:

按以下方式连接：

(i) At one end, to the static line above the static-line pins or, if static-line pins are not used, above the static-line ties to the parachute cone.

一头在 Static Line 针上方连接 Static Line，或者在 Static Line 针未使用的情况下，连在 Static Line 与降落伞顶锥的连结上。

(ii) At the other end, to the pilot chute apex, bridle cord, or bridle loop, or, if no pilot chute is used, to the main parachute canopy.

另一头连在引导伞头上、引导伞系带上，或引导伞系带环上，或者，如果未使用引导伞，连在主降落伞上。

(b) No person may attach an assist device required by paragraph (a) of this section to any main parachute unless that person is a certificated parachute rigger or that person makes the next parachute jump with that parachute.

除持证降落伞装备师和使用该降落伞进行下一次跳伞的人以外，任何人不得将本节（a）款所规定的辅助装置系在任何主降落伞上。

(c) An assist device is not required for parachute operations using direct-deployed, ram-air parachutes.

对于使用直接开伞的冲压空气式降落伞的降落伞作业，辅助装置不是必须的。

SEC. 105.49: FOREIGN PARACHUTISTS AND EQUIPMENT「外籍跳伞者和装备」

(a) No person may conduct a parachute operation, and no pilot in command of an aircraft may allow a parachute operation to be conducted from that aircraft with an unapproved foreign parachute system unless—

对于未经批准的外国降落伞系统，任何人不得进行降落伞作业，任何飞行器的机长不得允许其在该飞行器上进行降落伞作业，除非—

(1) The parachute system is worn by a foreign parachutist who is the owner of that system.

此降落伞系统的所有者为外籍跳伞者。

(2) The parachute system is of a single-harness dual parachute type.

降落伞系统是单背带双降落伞类型的。

(3) The parachute system meets the civil aviation authority requirements of the foreign parachutist's country.

降落伞系统符合外籍跳伞者的国家民航局的要求。

(4) All foreign non-approved parachutes deployed by a foreign parachutist during a parachute operation conducted under this section shall be packed as follows—

在根据本节规定进行的降落伞作业中，由外籍跳伞者使用的所有未经批准的外国降落伞，必须根据以下规定进行叠伞—

(i) The main parachute must be packed by the foreign parachutist making the next parachute jump with that parachute, a certificated parachute rigger, or any other person acceptable to the Administrator.

主降落伞必须由使用该降落伞进行下一次跳伞的外籍跳伞者、持证降落伞装备师，或管理局认可的任何其他人员进行叠伞。

(ii) The reserve parachute must be packed in accordance with the foreign parachutist's civil aviation authority requirements, by a certificated parachute rigger, or any other person acceptable to the Administrator.

备用降落伞必须按照外籍跳伞者的国家民航当局的要求，由持证降落伞装备师或管理局可接受的任何其他人进行叠伞。

SUBCHAPTER G — AIR CARRIERS AND OPERATORS FOR COMPENSATION OR HIRE: CERTIFICATION AND OPERATIONS「航空公司和营利性运营商：认证和运营」

PART 119—CERTIFICATION: AIR CARRIERS AND COMMERCIAL OPERATORS「认证：航空公司和商业运营商」

SEC. 119.1: APPLICABILITY「适用性」

(a) This part applies to each person operating or intending to operate civil aircraft—
本部分适用于所有在以下情况操作或拟操作民用飞行器的人—

(1) As an air carrier or commercial operator, or both, in air commerce; or
在航空商业中，作为航空公司或商业运营商，或两者兼有；或

(2) When common carriage is not involved, in operations of U.S.-registered civil airplanes with a seat configuration of 20 or more passengers, or a maximum payload capacity of 6,000 pounds or more.
在不涉及公共运输时，操作座位为 20 人或 20 人以上，或最大有效载荷能力为 6000 磅或以上的美国注册民用飞机。

(b) This part prescribes—
这部分规定了—

(1) The types of air operator certificates issued by the Federal Aviation Administration, including air carrier certificates and operating certificates;
联邦航空局签发的航空运营商证书的类型，包括航空公司证书和营运证书;

(e) Except for operations when common carriage is not involved conducted with airplanes having a passenger-seat configuration of 20 seats or more, excluding any required crewmember seat, or a payload capacity of 6,000 pounds or more, this part does not apply to—
除了不涉及公共运输的、乘客座位配置为 20 个或以上（减去规定的机组成员座位或 6000 磅或以上有效载荷）的飞机，本部分不适用于—

(6) Nonstop flights conducted within a 25-statute-mile radius of the airport of takeoff carrying persons or objects for the purpose of conducting intentional parachute operations.
在起飞机场 25 法定英里半径范围内进行的、载运人员或物体、目的是进行有意的降落伞作业的、中途不停留的航次。

9-2 咨询通告 Advisory Circulars

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运营的建议标准起落航线和规范」

Department of Transportation—Federal Aviation Administration. 2/25/19 • Initiated by: AFS-800

交通运输部-联邦航空局 2019 年 2 月 25 日 发起：AFS-800

1. PURPOSE OF THIS ADVISORY CIRCULAR (AC)「本咨询通告的目的」

This AC calls attention to regulatory requirements, recommended operations, and communications procedures for operating at an airport without a control tower or an airport with a control tower that operates only part time. It recommends traffic patterns, communications phraseology, and operational procedures for use by aircraft, lighter-than-air aircraft, gliders, parachutes, rotorcraft, and ultralight vehicles. This AC stresses safety as the primary objective in these operations. This AC is related to the right-of-way rules under Title 14 of the Code of Federal Regulations (14 CFR) part 1, § 1.1 (traffic pattern), and part 91, §§ 91.113 and 91.126.

本咨询通告提请注意无塔台机场或仅有非全天候运行塔台的机场的监管要求、建议操作和通信程序。建议内容包括飞行器、比空气轻的航空器、滑翔机、降落伞、旋翼机和超轻型载具使用的起落航线、通信用语和运营程序。本咨询通告强调安全是这些操作的首要目标。本咨询通告涉及联邦法规汇编第 14 卷（以下简称 14 CFR）第 1 部分 1.1 节（起落航线）和第 91 部分 91.113 和 91.126 节下的通行权规则。

8. BACKGROUND AND SCOPE「背景和范围」

8.1. In the interest of promoting safety, the FAA, through its AIM, Chart Supplements, ACs, and other publications, provides frequency information, good operating practices, and procedures for pilots to use when operating at an airport without an operating control tower. The FAA believes that observance of a standard traffic pattern and the use of CTAF procedures as detailed in this AC will improve the safety and efficiency of aeronautical operations at airports without operating control towers.

为了促进安全，联邦航空局通过其航空信息手册（以下简称 AIM）、航图补充信息、咨询通告和其他出版物，提供无线电频率信息，良好的操作规范和程序，供飞行员在没有运行中的塔台的机场操作时使用。联邦航空局相信，遵守标准的起落航线，并使用通用交通咨询频率（CTAF）程序（如本咨询通告所详细说明），将使得没有运行中的塔台的机场的航空运营的安全性和效率得到提高。

8.2. Regulatory provisions relating to traffic patterns are found in 14 CFR parts 91, 93, and 97. The airport traffic patterns described in part 93 relate primarily to those airports where there is a need for unique traffic pattern procedures not provided for in part 91. Part 97 addresses instrument approach procedures (IAP). At airports without operating control towers, part 91 requires only that pilots of airplanes approaching to land make all turns to the left, unless light signals or visual markings indicate that turns should be made to the right (see approved light gun signals in § 91.125, visual markings and right-hand patterns in the PHAK, Chapter 14, Airport Operations, and the AIM, Chapter 4, Section 3, Airport Operations).

与起落航线相关的法规位于 14 CFR 第 91、93 和 97 部分。第 93 部分所述的机场起落航线主要涉及那些需要采用第 91 部分未规定的特殊起落航线程序的机场。第 97 部分介绍了仪器进近程序（IAP）。在没有运行中的塔台的机场，第 91 部分仅要求进近着陆的飞机的转弯方向仅能为左，除非灯光信号或视觉标识指定转弯方向仅能为右（参见 91.125 节中批准的光枪信号、飞行员航空知识手册（以下简称 PHAK）第 14 章“机场的运行”中的视觉标识和右手航线，以及 AIM 第 4 章第 3 节“机场的运行”）。

8.2.1. The FAA does not regulate traffic pattern entry, only traffic pattern flow. For example, an aircraft on an instrument approach flying on the final approach course to land would follow the requirements dictated by the approach procedure. A visual flight rules (VFR) aircraft on a long, straight-in approach for landing never enters the traffic pattern unless performing a go-around or touch and go after landing (see paragraph 9.5).

联邦航空局不管制如何进入起落航线，只管制起落航线的流程。例如，一架采用仪表进近的飞行器，在最后进近航线上飞行并降落时将遵循进近程序所规定的要求。采用目视飞行规则（VFR）的飞行器在长距离直线进近着陆时，并不会进入起落航线，除非进行复飞，或者在着陆触地后立即拉升起飞（见 9.5 款）。

8.2.1.1. Traffic pattern entry information is advisory, provided by using this AC or by referring to the AIM and the PHAK. Approaching to land in relation to traffic patterns by definition would mean aircraft in the traffic pattern landing or taking off from an airport. An aircraft not in the traffic pattern would not be bound by § 91.126(b) (see paragraph 11.3 for aircraft crossing over midfield above pattern altitude to enter the pattern). Requirements for traffic pattern flow under § 91.126 continue to apply to other airspace classification types under § 91.127 (Class E airspace), § 91.129 (Class D airspace), and § 91.130 (Class C airspace), particularly when a towered airport is currently operating as a non-towered airport.

起落航线进入信息为咨询信息，由本咨询通告或 AIM 和 PHAK 提供。参照起落航线进近着陆，根据定义，意指飞行器在该起落航线下在机场降落或起飞。不在该起落航线上的飞行器不受 § 91.126（b）的约束（关于飞行器在航线高度以上飞越中场进入航线，见 11.3 款）。§ 91.126 下的起落航线流程规定继续适用于 § 91.127（E 级空域）、§ 91.129（D 级空域）和 § 91.130（C 级空域）下的其他空域类型，特别是当有塔台机场作为无塔台机场运行时。

9. GENERAL OPERATING PRACTICES「一般操作规范」

9.1. **Left Traffic.** Use of standard traffic patterns (left turns) for all aircraft and CTAF procedures by radio-equipped aircraft are required at all airports without operating control towers unless indicated otherwise by visual markings, light gun signals, airport publications, or published approach procedure. It is recognized that other traffic patterns (right turns) may already be in common use at some airports or that special circumstances or conditions exist that may prevent use of the standard traffic pattern. Right-hand patterns are noted at airports on an aeronautical chart with an "RP" designator and the applicable runway next to the airport symbol.

左手航线。在所有没有运行中的塔台的机场，要求所有飞行器使用标准起落航线（左转），并要求所有配备无线电的飞行器使用 CTAF 程序，除非有视觉标识、光枪信号、机场发布的信息或公布的进近程序另做出不同指示。其他类型的起落航线（右手航线）可能已经在一些机场普遍使用，或者存在可能妨碍使用标准起落航线的特殊情况或条件。使用右手航线的机场的航图上有"RP"标志，机场标志旁边标注了可用跑道。

9.2. **Collision Avoidance.** The pilot in command's (PIC) primary responsibility is to see and avoid other aircraft and to help them see and avoid his or her aircraft. Keep lights and strobes on. The use of any traffic pattern procedure does not alter the responsibility of each pilot to see and avoid other aircraft. Pilots are encouraged to participate in "Operation Lights On," a voluntary pilot safety program described in the AIM, paragraph 4-3-23, that is designed to improve the "see-and-avoid" capabilities.

碰撞的避免。机长（PIC）的主要责任是看到和避开其他飞行器，并协助对方看到和避开自己的飞行器。指示灯和频闪灯应被打开。任何起落航线程序的使用都不会免除飞行员看到和避开其他飞行器的责任。我们鼓励飞行员参加"亮灯行动"（一个面向飞行员的志愿安全项目，旨在提高飞行员"看到和避开"其他飞行器的能力，具体见 AIM 4-3-23）。

9.2.1. Unmanned Aircraft. Unmanned aircraft (commonly known as drones or model aircraft), like manned aircraft, are allowed to operate in Class G airspace without specific air traffic control (ATC) authorization and without required radio communications. The remote PIC and the Unmanned Aircraft System (UAS) operator must always yield right-of-way to a manned aircraft and not interfere with manned aircraft operations. Additional information regarding unmanned aircraft operations may be found in AC 91-57, AC 107-2, and 14 CFR part 107.

无人驾驶飞行器。无人驾驶飞行器（通常称为无人机或模型飞机）和有人驾驶的飞行器一样可以在 G 类空域操作，而无需特定的空中交通管制（ATC）授权，也没有无线电通信要求。模型飞机遥控者和无人机系统（UAS）操作员必须始终向有人驾驶的飞行器让出通行权，并且不得干扰有人驾驶飞行器的活动。关于无人驾驶飞行器操作的附加信息可在 AC 91-57、AC 107-2 和 14 CFR 第 107 部分中找到。

Note: Operators of UAS are required to obtain ATC authorization prior to operating in Class B, C, D, and surface Class E airspaces.

注：无人机系统操作人员在 B、C、D 类空域和地面 E 类空域进行活动前，需获得空中交通管制授权。

9.3. Preflight Actions. As part of the preflight familiarization with all available information concerning a flight, each pilot should review all appropriate publications (e.g., Chart Supplements, the AIM, and NOTAMs), for pertinent information on current traffic patterns at the departure and arrival airports.

起飞前的准备。作为飞行前熟悉所有有关飞行的可用信息的其中一步，飞行员应该查阅合适的出版物，例如航图补充信息、AIM 和 NOTAM（航空人员通知），以获得有关出发和到达机场当前采用的起落航线的相关信息。

9.4. Traffic Flow. It is recommended that pilots use visual indicators, such as the segmented circle, wind direction indicator, landing direction indicator, and traffic pattern indicators that provide traffic pattern information. If other traffic is present in the pattern, arriving or departing aircraft should use the same runway as these aircraft. Transient aircraft may not know local ground references, so pilots should use standard pattern phraseology, including distances from the airport.

交通流程。建议飞行员利用提示起落航线信息的视觉标识，如虚线圆、风向标、着陆方向指示标、起落航线指示标等。如果航线中有其他飞行器，进场或离场的飞行器应使用与这些飞行器相同的跑道。短暂过路的飞行器可能不熟悉当地的地面参考物，所以飞行员应该使用标准的航线用语，包括与机场的距离。

9.5. Straight-In Landings. The FAA encourages pilots to use the standard traffic pattern when arriving or departing a non-towered airport or a part-time-towered airport when the control tower is not operating, particularly when other traffic is observed or when operating from an unfamiliar airport. However, there are occasions where a pilot can choose to execute a straight-in approach for landing when not intending to enter the traffic pattern, such as a visual approach executed as part of the termination of an instrument approach. Pilots should clearly communicate on the CTAF and coordinate maneuvering for and execution of the landing with other traffic so as not to disrupt the flow of other aircraft. Therefore, pilots operating in the traffic pattern should be alert at all times to aircraft executing straight-in landings, particularly when flying a base leg prior to turning final.

直线进近着陆。联邦航空局鼓励飞行员在到达或离开无塔台的机场，以及有塔台但塔台不在运行时段的机场时，使用标准起落航线，特别是在观察到有其他飞行器时，或在不熟悉的机场进行操作时。然而，在某些情况下，飞行员如果无计划进入起落航线，也可以选择直线进近着陆，例如，作为终止仪表进近的一步，执行目视进近。飞行员应在 CTAF 上明确沟通，与其他飞行器协调着陆的动作和执行，以免干扰其他飞行器的飞行。因此，在起落航线中的飞行员应时刻警惕直线进场着陆的飞行器，特别是在最后进近前的基线边飞行时。

9.6. Instrument Flight Rules (IFR) Traffic. Pilots conducting instrument approaches in visual meteorological conditions (VMC) should be particularly alert for other aircraft in the pattern so as to avoid interrupting the flow of traffic and should bear in mind they do not have priority over other VFR traffic. Pilots are reminded that circling approaches require left-hand turns unless the approach procedure explicitly states otherwise. This has been upheld by prior FAA legal interpretations of § 91.126(b).

仪表飞行规则（IFR）下的交通。在目视气象条件（VMC）下进行仪表进场的飞行员，应特别留意该航线下的其他飞行器，以免干扰交通，并应记住，他们的优先级并不比其他目视飞行的飞行器高。飞行员应注意，除非进近程序另有明确说明，否则盘旋进近时只能进行左转。这一点已得到联邦航空局关于 91.126(b)的法律解释的支持。

9.6.1. Non-instrument-rated pilots might not understand radio calls referring to approach waypoints, depicted headings, or missed approach procedures. IFR pilots often indicate that they are on a particular approach, but that may not be enough information for a non-IFR-rated pilot to know your location. It is better to provide specific direction and distance from the airport, as well as the pilot's intentions upon completion of the approach. For example, instead of saying, "PROCEDURE TURN INBOUND V-O-R APPROACH 36," it should be "6 MILES SOUTH ... INBOUND V-O-R APPROACH RUNWAY 36, LOW APPROACH ONLY" or "6 MILES SOUTH ...

INBOUND V-O-R APPROACH RUNWAY 36, LANDING FULL STOP."

无仪表飞行等级资格的飞行员可能无法理解无线电呼叫中所提及的进近航路点、描述航向或进近错过处理程序。仪表飞行的飞行员经常表述他们在进行某个特定的进近，但非仪表飞行等级的飞行员可能依然无法知道其位置。最好的方法是同时讲明飞机相对于机场的具体方向和距离，以及飞行员在进场后的意图。例如，不要说“程序转向进场 VOR 进近 36”，而应该说“南 6 英里…进场 VOR 进近，36 号跑道，仅低空进近”或“南 6 英里…进场 VOR 进近，36 号跑道，全跑道着陆（*译者注：滑跑到全停的着陆*）。”

（译者注：这里直译了英语无线电对话内容，关于国内航空无线电通信的标准用语请参考有关材料）

9.7. **No-Radio Aircraft.** Pilots should be aware that procedures at airports without operating control towers generally do not require the use of two-way radios; therefore, pilots should be especially vigilant for other aircraft while operating in the traffic pattern. Pilots of inbound aircraft that are not capable of radio communications should determine the runway in use prior to entering the traffic pattern by observing the landing direction indicator, the wind indicator, landing and departing traffic, previously referring to relevant airport publications, or by other means.

没有无线电的飞行器。飞行员应知道，没有运行中的塔台的机场一般不要求进行双向无线电通信；因此，飞行员在起落航线上时应特别警惕其他飞行器。没有无线电通讯能力的进场飞行器的飞行员，应在进入起落航线前，通过观察着陆方向指示标、风向标、其他起降的飞行器、提前查阅有关机场资料，或其他方法，以确定应使用哪条跑道。

9.8. **Wake Turbulence.** All aircraft generate wake turbulence. Therefore, pilots should be prepared to encounter turbulence while operating in a traffic pattern and especially when in the trail of other aircraft. Wake turbulence can damage aircraft components and equipment. In flight, avoid the area below and behind the aircraft generating turbulence, especially at low altitude where even a momentary wake encounter can be hazardous. All operators should be aware of the potential adverse effects that their wake, rotor, or propeller turbulence has on light aircraft and ultralight vehicles.

尾流。所有飞行器都会产生尾流。因此，当飞行员在起落航线上操作时，特别是在其他飞行器的尾迹中操作时，应做好遇到湍流的准备。尾流湍流会损坏飞行器的部件和设备。在飞行中，要避开飞行器下方和后方产生湍流的区域，特别注意在低空，即使是短暂遭遇尾流也可能是危险的。所有飞行器运营方都应该认识到尾流、旋翼或螺旋桨湍流对轻型飞行器和超轻型载具的潜在不利影响。

9.9. **Other Approaches to Land.** Pilots should be aware of the other types of approaches to land that may be used at an airport when a pilot indicates they are doing so, which may or may not be initiated from the traffic pattern. The more common types of these include a short approach, low approach, or overhead approach.

其他类型的进近。飞行员应该知悉可能在机场使用的其他类型的进近，以在其他飞行员提及这些类型的进近时能够明白。这些类型的进近可能也可能不在起落航线上开始。较常见的其他进近方式包括短进近、低空进近、越场进近。

9.9.1. A short approach is executed when the pilot makes an abbreviated downwind, base, and final legs turning inside of the standard 90-degree base turn. This can be requested at a towered airport for aircraft spacing, but is more commonly used at a non-towered airport or a part-time-towered airport when the control tower is not operating, when landing with a simulated engine out or completing a power-off 180-degree accuracy approach commercial-rating maneuver.

短进近（或短五边进近）是指飞行员在标准的 90 度基础转向内，飞长度缩短的下风边、基线边和最后一边转向。在有塔台的机场可以申请这么做，以拉开飞行器间距，但在无塔台的机场或有塔台但塔台不在运行时段的机场更常见，主要用于模拟发动机熄火情况下的着陆，或发动机关机状态下的 180 度高精度进近机动，以考取商业飞行员等级。

9.9.2. A low approach is executed when an aircraft intends to overfly the runway, maintaining runway heading but not landing. This is commonly used by aircraft flying practice instrument approaches.

低空进近（或低空通场）指飞行器飞越跑道，航向保持与跑道一致，但不着陆，是常用的仪表进近练习手段。

9.9.3. An overhead approach is normally performed by aerobatic or high-performance aircraft and involves a quick

180-degree turn and descent at the approach end of the runway before turning to land (described in the AIM, paragraph 5-4-27, Overhead Approach Maneuvers).
越场进近指飞行器在降落前，在跑道的进近端快速 180 度转弯下降，通常由特技飞行器或高性能飞行器进行（请参考 AIM 5-4-27，越场进近机动）。

10. COMMUNICATIONS PROCEDURES「通信程序」

The following information is intended to supplement the AIM, paragraph 4-1-9, Traffic Advisory Practices at Airports Without Operating Control Towers.
以下信息是 AIM 4-1-9“无运行中的塔台的机场的交通咨询规范”的补充。

10.1. Recommended Traffic Advisory Practices. All traffic within a 10-mile radius of a non-towered airport or a part-time-towered airport when the control tower is not operating should continuously monitor and communicate, as appropriate, on the designated CTAF until leaving the area or until clear of the movement area. After first monitoring the frequency for other traffic present passing within 10 miles from the airport, self-announcing of your position and intentions should occur between 8 and 10 miles from the airport upon arrival. Departing aircraft should continuously monitor/communicate on the appropriate frequency from startup, during taxi, and until 10 miles from the airport, unless 14 CFR or local procedures require otherwise.
建议的交通咨询规范。在无塔台机场或有塔台但塔台不在运行时段的机场 10 英里半径内的所有交通，应视情况在指定的 CTAF 上持续监听和进行通信，直到离开该区域或离开飞行器活动区域为止。首先，应监听相关频率，以了解机场 10 英里范围内通过的其他飞行器的情况，然后在到达机场 8 到 10 英里范围内广播声明自身的位置和意图。离港的飞行器在启动、滑行过程中，以及直到离开机场 10 英里内为止，都应持续监控适当频率或进行通信，除非 14 CFR 或当地程序另有要求。

10.1.1. To achieve the greatest degree of safety, it is essential that:
为了最大程度保障安全，必须：

1. All radio-equipped aircraft transmit/receive on a common frequency identified for the purpose of airport advisories, as identified in appropriate aeronautical publications.
所有配备无线电设备的飞行器都应使用有关航空出版物所确定的用于机场咨询的通用频率进行发射/接收。
2. Pilots use the correct airport name, as identified in appropriate aeronautical publications, when exchanging traffic information to reduce the risk of confusion. For example, using “Midwest National Traffic” instead of the town name “Mosby Traffic” or “Clay County Traffic” at KGPH when the airport name is printed “Midwest National” on aeronautical charts.
飞行员在沟通交通信息时，应参照合适的航空出版物，使用正确的机场名称，以减少造成混淆的风险。例如，对于 KGPH（*译者注：Midwest National 机场的 ICAO 代码*），机场名称在航图上写为“Midwest National”，则表述时应使用“Midwest National Traffic”而不应使用城镇名称“Mosby Traffic”或“Clay County Traffic”。
3. To help identify one airport from another, the correct airport name should be spoken at the beginning and end of each self-announce transmission.
为了帮助识别和区分机场，飞行员应该在每次发出广播声明时，在开始和结束时说出正确的机场名称。
4. Pilots clarify intentions if a communication sent by either their aircraft or another aircraft was potentially not received or misunderstood.
如果自身飞行器或其他飞行器发出的通信内容存在未被接收到或被误解的可能，飞行员应澄清意图。
5. Pilots limit communications on CTAF frequencies to safety-essential information regarding arrivals, departures, traffic flow, takeoffs, and landings. The CTAF should not be used for personal conversations.
飞行员应仅在 CTAF 频率上沟通对安全至关重要的信息，如进港、离港、交通、起飞和降落。CTAF 不应用于私人谈话。

10.2. Information Provided by UNICOM. UNICOM stations may, upon request, provide pilots with weather information, wind direction, the recommended runway, or other necessary information. If the UNICOM

frequency is designated as the CTAF, it will be identified in appropriate aeronautical publications. If wind and weather information is not available, it may be obtainable from nearby airports via the Automatic Terminal Information Service (ATIS) or Automated Weather Observing System (AWOS). UNICOM operators are not required to communicate with pilots, and if they do, there are no standards for the information conveyed.

UNICOM 提供的信息（*译者注：UNICOM 指无塔台机场的私营陆空无线电咨询服务*）。在收到请求时，UNICOM 地面站可向飞行员提供天气、风向、建议跑道或其他必要信息。如果 UNICOM 频率被指定为 CTAF，则会在适当的航空出版物中被标识出来。如果缺少风力和天气信息，也可附近机场的通过自动航站信息服务（ATIS）或自动天气观测系统（AWOS）获取。UNICOM 运营方不需要与飞行员沟通，即使进行沟通，也没有信息的传递标准。

10.3. Self-Announce Position and/or Intentions. "Self-announce" is a procedure whereby pilots broadcast their aircraft call sign, position, altitude, and intended flight activity or ground operation on the designated CTAF. This procedure is used almost exclusively at airports that do not have an operative control tower on the airport. If an airport has a control tower that is either temporarily closed or operated on a part-time basis, pilots should use the published CTAF to self-announce position and/or intentions when entering within 10 miles of the airport.

广播声明位置和/或意图。"广播声明"是飞行员在指定的 CTAF 上广播自身飞行器呼号、位置、高度、预定飞行活动，或地面操作的程序。这一程序几乎只在没有运行中的塔台的机场使用。如果机场塔台临时关闭，或者如果塔台仅在部分时间段运行，那么飞行员在进入机场 10 英里范围内时，应使用公开的 CTAF 频率进行广播声明位置和/或意图。

10.3.1. Self-announce transmissions may include aircraft type to aid in identification and detection. Paint schemes and color or style descriptions may be added to the use of the aircraft call sign and type, but should not replace type or call sign. For example, "MIDWEST TRAFFIC, TWIN COMMANDER FIVE ONE ROMEO FOXTROT TEN MILES NORTHEAST" or "MIDWEST TRAFFIC, FIVE ONE ROMEO FOXTROT TWIN COMMANDER TEN MILES NORTHEAST." In some cases, where the type of aircraft may not be familiar to pilots, the color and description may be added to the type and call sign. For instance, "MIDWEST TRAFFIC, EXPERIMENTAL SKYBOLT NOVEMBER THREE TWO DELTA SIERRA, ORANGE AND WHITE BIPLANE TEN MILES NORTHEAST." When referring to a specific runway, pilots should use the runway number and not use the phrase "Active Runway," because there is no official active runway at a nontowered airport. To help identify one airport from another when sharing the same frequency, the airport name should be spoken at the beginning and end of each self-announce transmission.

广播声明内容可包括飞行器型号，以帮助他人识别和监测。关于飞机涂装、颜色或风格的表述可以添加到飞行器呼号和型号中，但不应取代型号或呼号。例如，"中西部交通，机型 Twin Commander，51RF，东北 10 英里"或"中西部交通，51RF，机型 Twin Commander，东北 10 英里"。在某些情况下，飞行员可能不熟悉飞行器的型号，那么可以在型号和呼号中添加飞机的颜色和描述。例如，"中西部交通，机型 Experimental SKYBOLT，N32DS，橙色和白色双翼飞机，东北 10 英里"。当提及特定跑道时，飞行员应该使用跑道编号，而不应说"当前可用的跑道"，因为没有塔台的机场没有正式的可用跑道。当同一个频率被多机场共用时，为了帮助区分不同的机场，飞行员应该在每次发出广播声明时，在开始和结束时说出正确的机场名称。

（译者注：这里直译了英语无线电对话内容，关于国内航空无线电通信的标准用语请参考有关材料）

Note: Pilots are reminded that the use of the phrase, "ANY TRAFFIC IN THE AREA, PLEASE ADVISE," is not a recognized self-announce position and/or intention phrase and should not be used under any condition. Any traffic that is present at the time of your self-announcement that is capable of radio communications should reply without being prompted to do so.

注：飞行员应注意，"如果该区域有任何其他飞行器，请告知"的表述在广播声明位置和/或意图时是不被认可的，在任何情况下都不应使用。在飞行员进行广播声明时，任何有无线电通信能力的飞行器都应该在无需提示的情况下进行回复。

10.4. Confusing Language. To avoid misunderstandings, pilots should avoid using the words "to" and "for"

whenever possible. These words might be confused with runway numbers or altitudes. The use of "inbound for landing" should also be avoided. For example, instead of saying, "MIDWEST TRAFFIC, EIGHT ONE TANGO FOXTROT TEN MILES TO THE NORTHEAST, INBOUND FOR LANDING RUNWAY TWO TWO MIDWEST,' it is more advisable to say, "MIDWEST TRAFFIC, EIGHT ONE TANGO FOXTROT TEN MILES NORTHEAST OF THE AIRPORT, LANDING STRAIGHT IN RUNWAY TWO TWO, MIDWEST,' so it does not confuse runway 4, runway 22, or the use of an IAP on arrival.

易混淆的语言表述。为了避免误解，飞行员应该尽可能避免使用"to"（读音接近 two）和"for"（读音接近 four）这两个词。这些词可能会与跑道编号或高度混淆。还应避免使用"inbound for landing"（进场着陆）的表述。例如可以这么表述："中西部交通，81TF，机场东北方 10 英里，直线进近降落在 22 号跑道，中西部"，但不应该这么表述："中西部交通，81TF，东北 10 英里，进场着陆，22 号跑道，中西部"，以免混淆 4 号跑道，22 号跑道，或者在到达时使用仪表进近程序。

（译者注：这里直译了英语无线电对话内容，关于国内航空无线电通信的标准用语请参考有关材料）

10.5. Unlisted Frequencies. Where there is no tower, CTAF, or UNICOM station depicted for an airport on an aeronautical chart, use MULTICOM frequency 122.9 for self-announce procedures. Such airports should be identified in appropriate aeronautical information publications.

未列明频率。如果某个无塔台机场在航图上既无标注 CTAF，也无 UNICOM 地面站，则应使用 MULTICOM 频率 122.9，以进行广播声明。此类机场应在合适的航空信息刊物中被标识出来。

10.6. Practice Instrument Approaches in VFR Conditions. Pilots conducting practice instrument approaches should be particularly alert for other aircraft that may be departing in the opposite direction or on a base leg or final approach to the runway associated with the approach. Conducting any practice instrument approach, regardless of its direction relative to other airport operations, does not take priority over other VFR aircraft. Pilots should be ready to communicate on CTAF, discontinue the approach, and enter a traffic pattern as needed, based on the traffic saturation of the airport and/or the current runway in use, to maintain aircraft separation and aviation safety. Pilots are reminded that circling approaches, practice or actual, require left-hand turns unless the approach procedure explicitly states otherwise. This has been upheld by prior FAA legal interpretations of § 91.126(b).

在目视飞行规则下练习仪表进近。练习仪表进近的飞行员应特别警惕可能从相反方向起飞的其他飞行器，或影响本次进近的在基线边或与最后进近边上的飞行器。进行任何仪表进近练习时，无论其相对于本机场的其他航空活动的方向是什么，都不比其他目视进近飞行器有更高的优先级。飞行员应根据机场和/或目前正在使用的跑道的交通饱和度，随时准备在 CTAF 上进行沟通，随时准备终止进近，以及准备根据需要进入起落航线，以保持飞行器间距和航空安全。飞行员应注意，除非进近程序另有明确说明，否则无论是练习进近还是实际进近，转弯时都只能左转。这一点已得到联邦航空局关于 91.126(b)的法律解释的支持。

10.7. Disagreements. Do not correct other pilots on frequency (unless it is safety critical), particularly if you are aware you are correcting a student pilot. If you disagree with what another pilot is doing, operate your aircraft safely, communicate as necessary, clarify their intentions and, if you feel you must discuss operations with another pilot, wait until you are on the ground to have that discussion. Keep in mind that while you are communicating, you may block transmissions from other aircraft that may be departing or landing in the opposite direction to your aircraft due to IFR operations, noise abatement, obstacle avoidance, or runway length requirements. An aircraft might be using a runway different from the one favoring the prevailing winds. In this case, one option is to simply point out the current winds to the other pilots and indicate which runway you plan on using because of the current meteorological conditions.

分歧。不要在无线电通信中纠正其他飞行员的错误（除非涉及关键安全问题），特别是不要纠正飞行员学员。如果你不同意另一名飞行员的做法，那就安全地驾驶你的飞行器，必要时进行沟通，弄清他们的意图。如果你觉得必须与另一名飞行员讨论操作，那就等到降落后再进行讨论。请记住，在通信过程中，因仪表进近操作、噪声污染控制、避障或跑道长度的要求而在你的飞行器的相反方向上起飞或降落的其他飞行器的通信可能会被你阻碍。有些飞行器可能会使用与主要风向不同的跑道。在这种情况下，可采取的一个办法是简单地向其他飞行员指出当前的风向，并指出你会根据当前的气象条件计划使用哪条跑道。

11. RECOMMENDED STANDARD TRAFFIC PATTERN「建议的标准起落航线」

The following information is intended to supplement the AIM, paragraph 4-3-3, Traffic Patterns, and the PHAK, Chapter14.

以下信息旨在补充 AIM, 4-3-3 段落，起落航线和 PHAK，第 14 章。

11.1. Traffic Pattern Design. Airport owners and operators, in coordination with the FAA, are responsible for establishing traffic patterns. The FAA encourages airport owners and operators to establish traffic patterns as recommended in this AC. Further, left traffic patterns should be established, except where obstacles, terrain, and noise-sensitive areas dictate otherwise (see Appendix A, Traffic Patterns).

起落航线的设计。机场所有者和运营方与联邦航空局协调，负责建立起落航线。联邦航空局鼓励机场所有者和运营方使用本咨询通告中建议的起落航线。此外，应优先使用左手起落航线，除非因地面障碍、地形和噪声污染控制区而另有规定（见附录 A，起落航线）。

11.2. Determination of Traffic Pattern. Prior to entering the traffic pattern at an airport without an operating control tower, aircraft should avoid the flow of traffic until established on the entry leg. For example, the pilot can check wind and landing direction indicators while at an altitude above the traffic pattern, or by monitoring the communications of other traffic that communicate the runway in use, especially at airports with more than one runway. When the runway in use and proper traffic pattern direction have been determined, the pilot should then proceed to a point well clear of the pattern before descending to and entering at pattern altitude.

起落航线的确定。对于没有运行中的塔台的机场，飞行器在进入起落航线之前应避开其他飞行器，直到已经开始进入航线。例如，飞行员可以在高于起落航线高度的上空查看风向标和着陆方向指示标，或者监听其他飞行器关于正在使用的跑道的通信内容，特别是在有多条跑道的机场。当明确哪条跑道可使用，以及明确正确起落航线方向后，飞行员应继续飞到一个远离起落航线的点位，然后降低高度至起落航线高度，并进入航线。

11.3. Traffic Pattern Entry. Arriving aircraft should be at traffic pattern altitude and allow for sufficient time to view the entire traffic pattern before entering. Entries into traffic patterns while descending may create collision hazards and should be avoided. Entry to the downwind leg should be at a 45 degree angle abeam the midpoint of the runway to be used for landing. The pilot may use discretion to choose an alternate type of entry, especially when intending to cross over midfield, based upon the traffic and communication at the time of arrival.

起落航线的进入。到达机场的飞行器应在起落航线的高度飞行，并在进入起落航线前留有足够的时间观察整个起落航线。在下降的同时进入起落航线可能会导致碰撞的危险，应该避免。下风边的进入路线应该对着计划着陆跑道的中点，呈 45 度角。飞行员可根据到达机场时的交通和通信情况，酌情选择另一种进入方式，特别是在打算穿越中场时。

Note: Aircraft should always enter the pattern at pattern altitude, especially when flying over midfield and entering the downwind directly. A midfield crossing alternate pattern entry should not be used when the pattern is congested. Descending into the traffic pattern can be dangerous, as one aircraft could descend on top of another aircraft already in the pattern. All similar types of aircraft, including those entering on the 45 degree angle to downwind, should be at the same pattern altitude so that it is easier to visually acquire any traffic in the pattern.

注：飞行器应始终在起落航线高度进入该航线，特别是飞越中场直接进入下风边时。当中场上空拥挤时，不得使用飞越中场的航线进入方式。在降低高度的同时进入起落航线是很危险的，因为一架飞行器可能会处在另一架已经在该航线中的飞行器上方。所有类似型号的飞行器，包括那些以 45 度角进入下风边的飞行器，应该在相同的航线高度飞行，以便更容易通过目视看到彼此。

11.4. Traffic Pattern Altitudes. It is recommended that airplanes observe a 1,000 foot above ground level (AGL) traffic pattern altitude. Large and turbine-powered airplanes should enter the traffic pattern at an altitude of 1,500 feet AGL or 500 feet above the established pattern altitude. Ultralight vehicles should operate no higher

than 500 feet below the powered aircraft pattern altitude. A pilot may vary the size of the traffic pattern depending on the aircraft's performance characteristics.

起落航线的高度。建议飞机遵循离地高度 1000 英尺的起落航线高度。大型涡轮动力飞机应在离地高度 1500 英尺或高于既定航线高度 500 英尺的高度进入起落航线。超轻型载具的高度应至少低于有动力的飞行器航线高度 500 英尺。飞行员可以根据飞行器的性能特点来调整起落航线的大小。

11.5. Descent and Base Turn. The traffic pattern altitude should be maintained until the aircraft is at least abeam the approach end of the landing runway on the downwind leg. The base leg turn should commence when the aircraft is at a point approximately 45 degrees relative bearing from the approach end of the runway.

下降高度和转向基线边。飞行器应保持在起落航线高度上飞行，直至在下风边上，至少横向正对着陆跑道的进近端时，才能开始下降高度。当飞行器与跑道的进近端的相对角度约为 45 度时，可开始向基线边转向。

11.6. Runway Preference. Landing and takeoff should be accomplished on the operating runway most nearly aligned into the wind. However, if a secondary runway is used (e.g., for length limitations), pilots using the secondary runway should avoid the flow of traffic to the runway most nearly aligned into the wind.

优先使用的跑道。着陆和起飞时，应使用跑道方向与风向较接近的可用跑道。然而，如果要使用次要跑道（例如由于跑道长度限制），飞行员应避开与使用跑道方向与风向较接近的跑道的其他飞行器的交通。

11.7. Takeoff and Go-Around. Airplanes on takeoff should continue straight ahead until beyond the departure end of the runway. Aircraft executing a go-around maneuver should continue straight ahead, beyond the departure end of the runway, with the pilot maintaining awareness of other traffic so as not to conflict with those established in the pattern. In cases where a go-around was caused by an aircraft on the runway, maneuvering parallel, or sidestepping to the runway may be required to maintain visual contact with the conflicting aircraft.

起飞和复飞。飞机在起飞时应继续直线前进，直到越过跑道的离场端。执行复飞的飞机应继续直线前进，越过跑道的离场端，同时飞行员保持对其他飞行器交通情况的掌握，以免与已在航线中的其他飞行器冲突。如果是因跑道上的飞行器而造成的复飞，可能需要与跑道平行飞行，回避跑道，以保持与产生冲突的飞行器的目视接触。

Note: Ask an instructor, Fixed-Base Operator (FBO) employee, or other pilots at your departure airport about special procedures such as noise abatement departure routes or local protocols if they are not apparent or directly communicated by the FAA. Not every airport has official noise abatement procedures, nor does every airport consistently share this information with transient pilots. One inconsiderate act, even if inadvertent, can undo months of effort by local pilots and the airport.

注：如果联邦航空局不明确或直接传达诸如关于噪声消减航线或本地规定的特殊程序，则可以向离场机场的指导员、固定基地运营商（FBO）员工或其他飞行员请教。不是每个机场都有官方的噪声消减程序，也不是每个机场都与临时路过的飞行员共享这一信息。一次考虑不周的行为，即使是无心之失，也会让当地飞行员和机场几个月来的努力付之东流。

11.8. Turning Crosswind. Airplanes remaining in the traffic pattern should not commence a turn to the crosswind leg until beyond the departure end of the runway and within 300 feet below traffic pattern altitude. Pilots should make the turn to downwind leg at the traffic pattern altitude.

转向侧风边。保持在起落航线中飞行的飞机在越过跑道离场端，且高度达到起落航线高度以下 300 英尺以内之前，不得开始转向侧风边。飞行员应在起落航线高度转向下风边。

Note: Pilots should be aware that the crosswind leg may be longer or shorter due to weather conditions that are unusually hot or cold.

注：飞行员应知悉，侧风边可能会因异常的天气冷热条件而延长或缩短。

11.9. Departing the Pattern. When departing the traffic pattern, airplanes should continue straight out or exit with a 45-degree left turn (right turn for right traffic pattern) beyond the departure end of the runway after reaching pattern altitude. Pilots need to be aware of any traffic entering the traffic pattern prior to commencing a turn.

离开起落航线。如果要离开起落航线，飞机应在飞越跑道离场端，且到达航线高度后，继续直线飞行或 45 度左转（如果使用右手航线则右转）。在开始转弯之前，飞行员需要知道正进入起落航线的任何飞行器的交通情况。

11.10. Airspeed Limitations. Airplanes should not be operated in the traffic pattern at an indicated airspeed of more than 200 knots (230 mph).

空速限制。飞机在起落航线上飞行时，指示空速不应超过 200 节（230 英里/小时）。

11.11. Right-of-Way. Throughout the traffic pattern, right-of-way rules apply as stated in § 91.113; any aircraft in distress has the right-of-way over all other aircraft. In addition, when converging aircraft are of different categories, a balloon has the right-of-way over any other category of aircraft; a glider has the right-of-way over an airship, airplane, or rotorcraft; and an airship has the right-of-way over an airplane or rotorcraft.

优先通行权。在整个起落航线中，91.113 规定的通行权规则都适用；任何遇险飞行器都有优先于其他飞行器的通行权。此外，如果互相飞行接近的飞行器属于不同类别，则气球具有高于任何其他类别飞行器的通行权；滑翔机相对于飞艇、飞机或旋翼机有优先通行权；飞艇相对于飞机或旋翼机有优先通行权。

Note: Parachute operations are subject to 14 CFR part 105. Parachute operators are required to coordinate their operations with the airport manager before they take place, and utilize proper radio notification during operations.

注：降落伞作业受到 14 CFR 第 105 部分规定的限制。降落伞作业运营方必须在作业前与机场管理者协调，并在作业过程中通过适当的无线电通信进行通知。

12. OTHER TRAFFIC PATTERNS「其他起落航线」

Airport operators routinely establish local procedures for the operation of gliders, parachutists, lighter-than-air aircraft, helicopters, and ultralight vehicles. Appendix B, Glider Operations, and Appendix C, Parachute Operations, illustrate these operations as they relate to recommended standard traffic patterns.

机场运营方通常会为滑翔机、跳伞者、轻型飞机、直升机和超轻型载具的运营建立当地的程序。附录 B 的“滑翔机作业”和附录 C 的“降落伞作业”解释了如何进行这些作业，以及建议的标准起落航线。

12.5 Parachute Operations「降落伞作业」

12.5.1. All activities are normally conducted under a NOTAM noting the location, altitudes, and time or duration of jump operations. The Chart Supplement lists airports where permanent Drop Zones (DZ) are located.

所有活动通常都在航空人员通知（NOTAM）下进行，通知说明了降落伞作业的位置、高度、时间或持续时间。航图补充信息列出了长期设立跳伞降落区的机场。

12.5.2. Jumpers normally exit the aircraft either above, or well upwind of, the airport and at altitudes well above traffic pattern altitude. Parachutes are normally deployed between 2,000 feet and 5,000 feet AGL and can be expected to be below 3,000 feet AGL within 2 miles of the airport.

跳伞者通常在机场正上方或上风向较远处，在远高于飞机起落航线的高度跳出飞行器。降落伞通常在离地 2000 英尺至 5000 英尺之间开伞，且在机场 2 英里范围内时，降落伞的高度一般都会在离地 3000 英尺以下。

12.5.3. Pilots of jump aircraft are required by part 105 to establish two-way radio communications with the ATC facility that has jurisdiction over the affected airspace prior to jump operations for the purpose of receiving information in the aircraft about known air traffic in the vicinity. In addition, when jump aircraft are operating at or in the vicinity of an airport, pilots are also encouraged to provide advisory information on the CTAF. For example, “Chambersburg traffic, jumpers away over Chambersburg.”

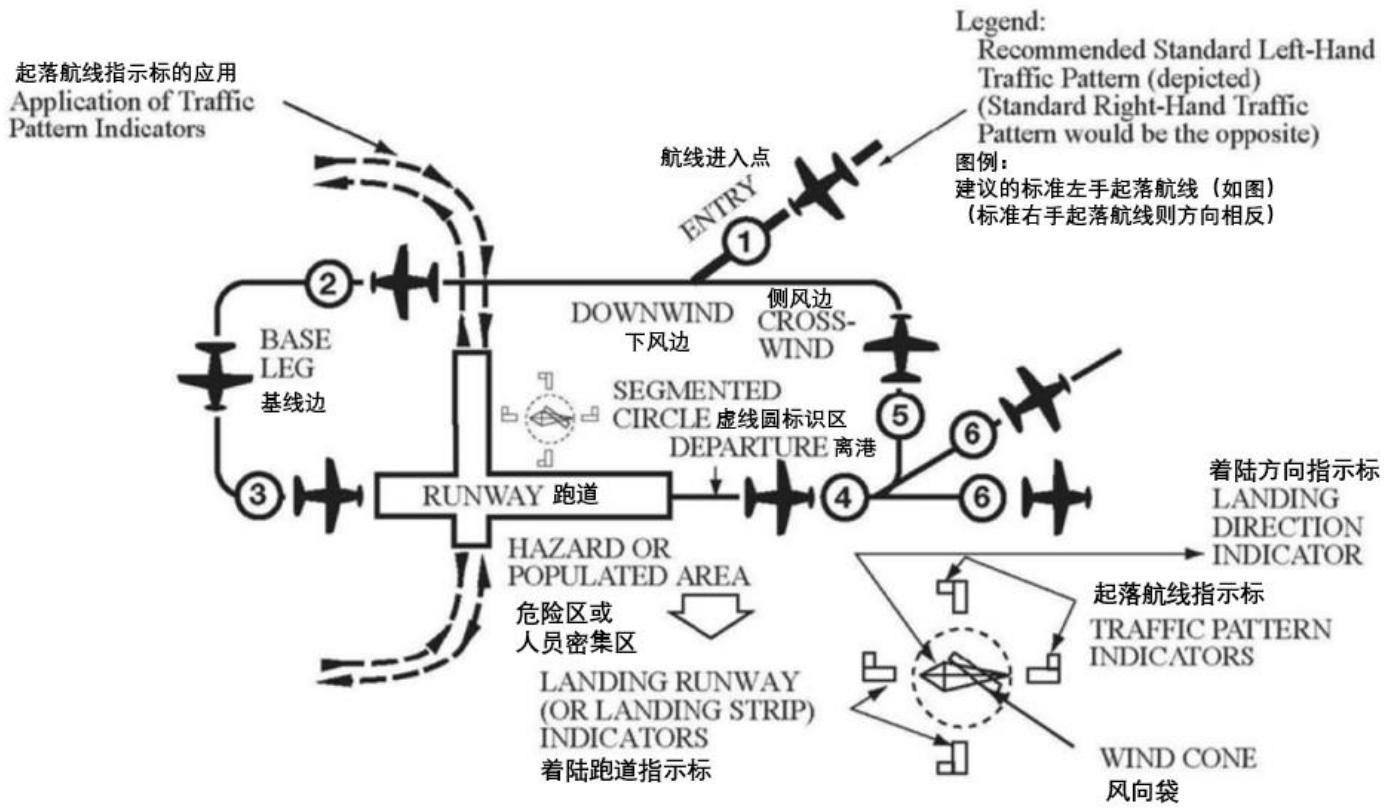
14 CFR 第 105 部分要求跳伞作业飞行器的飞行员在跳伞作业前与对受影响空域有管辖权的空中交通管制部门建立双向无线电通信，以便飞行器接收关于附近空中的已知飞行器的信息。此外，当跳伞作业飞行器在机场或机场进行附近作业时，飞行员也被鼓励在 CTAF 上提供咨询信息。例如：“钱伯斯堡交通，跳伞者已跳出在钱伯斯堡上方”。

12.5.4. When a DZ has been established at an airport, parachutists are expected to land within the DZ. At airports that have not established DZs, parachutists should avoid landing on runways, taxiways, aprons, and their

associated safety areas. Pilots and parachutists should both be aware of the limited flight performance of parachutes and take steps to avoid any potential conflicts between aircraft and parachute operations.
在设立了跳伞降落区的机场，跳伞者应在降落区内着陆。在未设立降落区的机场，跳伞者应避免降落在跑道、滑行道、停机坪及其相关安全区域内。飞行员和跳伞者都应知悉降落伞的有限飞行性能，并采取措施避免飞行器和降落伞作业之间的任何潜在冲突。

12.5.5. Appendix C depicts operations conducted by parachutists.
附录 C 描述了跳伞者进行的作业。

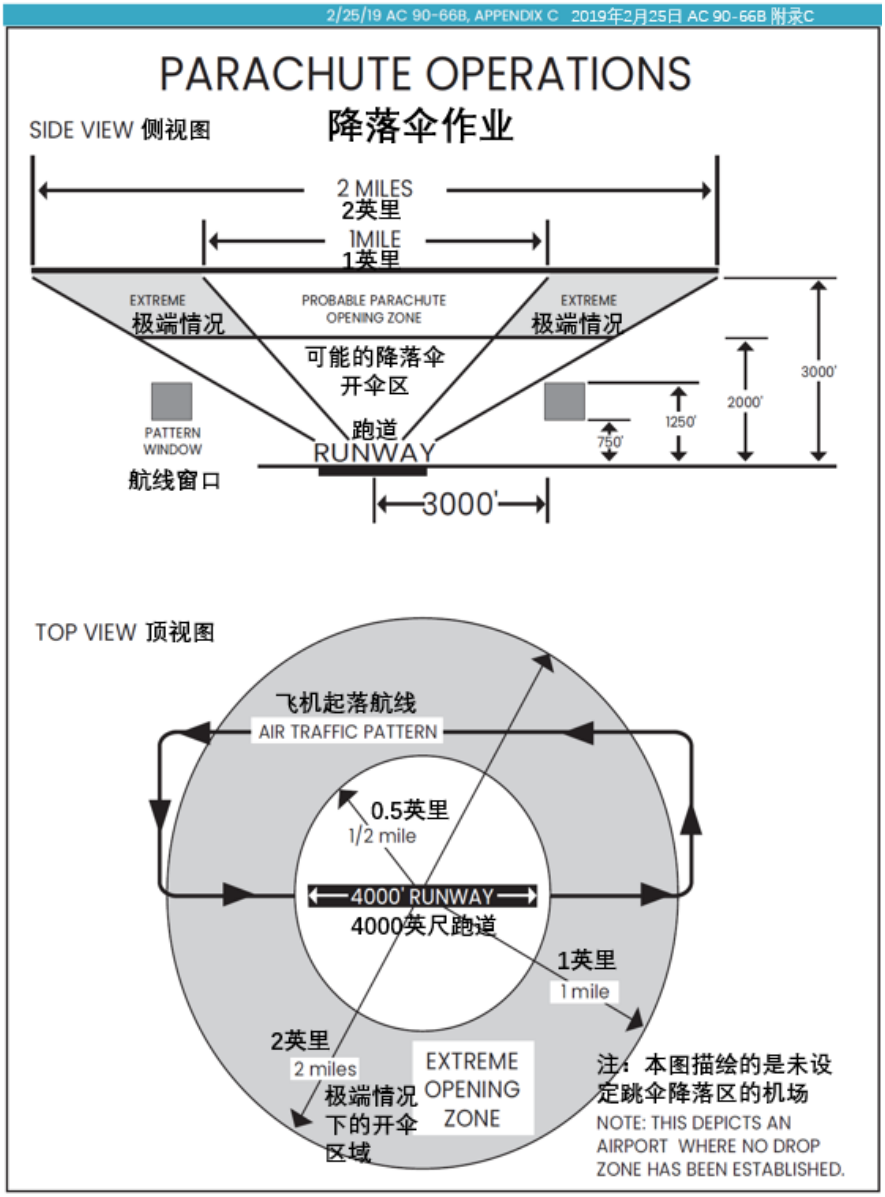
附录A 起落航线
单跑道（图表取自AIM 4-3-3）
APPENDIX A. TRAFFIC PATTERNS
Single Runway (Diagram from the AIM, Paragraph 4-3-3)



EXAMPLE–
示例–
Key to traffic pattern operations
起落航线的操作关键

1. Enter pattern in level flight, abeam the midpoint of the runway, at pattern altitude.
   进入起落航线时，应水平飞行，飞机在跑道中点横向对着的一侧飞行，且飞机高度处于航线高度。
2. Maintain pattern altitude until abeam approach end of the landing runway on downwind leg, begin descent and turn base at approximately 45 degrees from the intended landing point.
   保持高度在航线高度上，直到在下风边时，飞机横向对着跑道进近端的位置，这时开始下降并在离预定着陆点约 45 度的位置转弯，进入基线边。
3. Complete turn to final at least 1/4 mile from the runway.
   在离跑道至少 1/4 英里的地方完成向最后一边的转向。
4. Continue straight ahead until beyond departure end of runway.
   一直往前飞，直到越过跑道的离场端。

5. If remaining in the traffic pattern, commence turn to crosswind leg beyond the departure end of the runway within 300 feet of pattern altitude.
   如要保持在起落航线中飞行，则在离跑道离场端 300 英尺范围内开始转向侧风边。
6. If departing the traffic pattern, continue straight out, or exit with a 45-degree turn (to the left when in a left-hand traffic pattern; to the right when in a right-hand traffic pattern) beyond the departure end of the runway, after reaching pattern altitude.
   如要飞离该起落航线，应继续直飞，或在越过跑道离场端到达航线高度后 45 度转弯飞离（左手航线则左转，右手航线则右转）。



AC 105-2E—SPORT PARACHUTING「降落伞运动」

Department of Transportation—Federal Aviation Administration. 12/4/13 • Initiated by: AFS-800
交通运输部-联邦航空局 2013 年 4 月 12 日 发起：AFS-800

1. PURPOSE「目的」

This advisory circular (AC) provides suggestions to improve sport parachuting safety and disseminates information

to assist all parties associated with sport parachuting to be conducted in compliance with Title 14 of the Code of Federal Regulations (14 CFR) part 105. It also contains information for jumpers and riggers on parachuting equipment, on-airport parachuting operations, jump pilot training, aircraft maintenance programs, parachute rigging, and procedures for Federal Aviation Administration (FAA) authorization for flight operations with a removed or modified door.
本咨询通告提供了改善降落伞运动安全性的建议，并提供信息以协助降落伞运动相关方遵守 14 CFR 第 105 部分第 14 条的规定。本咨询通告还包含了面向跳伞者和装备师的，关于跳伞装备、机场降落伞作业、降落伞作业飞行员培训、飞行器维修计划、跳伞装备维护维修改装的信息，和联邦航空局对拆除或修改了舱门的飞机的飞行作业的授权程序。

2. CANCELLATION「撤销」

This AC cancels AC 105-2D, Sport Parachuting, dated May 18, 2011.
本咨询通告撤销了 2011 年 5 月 18 日的 AC 105-2D「运动跳伞」。

3. RELATED 14 CFR PARTS AND PUBLICATIONS「14 CFR 的相关部分和出版物」

The FAA's primary responsibility with respect to skydiving is the protection of air traffic and persons and property on the ground. Part 105 was developed to accomplish this task.
联邦航空局在跳伞方面的主要责任是保护空中交通安全和地面人员及财产的安全。第 105 部分是为了完成这项任务而制定的。

a. Title 14 CFR. This paragraph describes the 14 CFR parts that are of interest to skydivers, parachute riggers, and jump aircraft pilots. They may be downloaded from the FAA's website at: http://www.faa.gov/regulations_policies/faa_regulations/. Since the Federal regulations and other publications may be amended at any time, all FAA regulations, ACs, and other documents are also available for download from the FAA's website for continued compliance with current requirements.
14 CFR。本段介绍了 14 CFR 中与跳伞者、降落伞装备师、降落伞作业飞行器的飞行员有关的部分。这些部分可以从联邦航空局官网（http://www.faa.gov/regulations_ policies/faa_regulations/）下载。由于联邦法规和相关出版物可能在任何时候被修订，为了持续遵守最新的规定，所有的联邦航空局规定、咨询通告等文件都可以从联邦航空局官网下载。

(1) Part 65, Certification: Airmen Other Than Flight Crewmembers. Subpart F concerns parachute riggers, their eligibility requirements, privileges, and performance standards.
第 65 部分，认证：机组人员以外的航空人员。子部分 F 涉及降落伞装备师、其资格要求、特权和能力标准。

(2) Part 91, General Operating and Flight Rules. Parachute operators and jump pilots must comply with all applicable sections of part 91.
第 91 部分，一般操作和飞行规则。跳伞运营方和降落伞作业飞行员必须符合第 91 部分的所有适用章节。

(3) Part 105, Parachute Operations. This part is especially important to parachutists, parachute riggers, and the pilots who fly parachutists, since it contains regulations governing intentional parachute jumping.
第 105 部分，降落伞作业。这一部分对于跳伞者、降落伞装备师和搭载跳伞者的飞行器的飞行员来说特别重要，因为它包含了有关有计划跳伞的规定。

(4) Part 119, Certification. Air Carriers and Commercial Operators (§ 119.1(e)(6)). Pilots who conduct parachute operations within a 25 statute mile (sm) radius of the airport of departure may conduct them as commercial operations under part 91.
第 119 部分，认证。航空公司和商业运营商（§ 119.1（e）（6））。在起飞机场半径 25 法定英里范围内进行降落伞作业的飞行员可根据第 91 部分的规定进行商业运作。

b. Technical Standard Order (TSO)-C23, Personnel Parachutes Assemblies. The TSO-C23 series contains the minimum performance standards for parachute assemblies and components. Manufacturers design and test new parachutes to the most current TSO standards, although they may continue to produce parachutes approved under earlier TSO standards. The most current TSO-C23 document may be obtained from the FAA Web site: faa.

gov/regulations_policies/faa_regulations/.

技术标准规定（TSO）-C23：供人使用的降落伞。TSO-C23 系列规定包含降落伞和及其部件的最低性能标准。制造商根据最新的 TSO 标准设计和测试新的降落伞，尽管他们可能继续生产根据早期 TSO 标准认证的降落伞。最新的 TSO-C23 文档可从联邦航空局网站（faa. gov/regulations_policies/faa_regulations/）获得。

c. Parachuting Symbols on Charts, Electronic Navigation Equipment, and Related Publications. Having parachuting symbols on aeronautical charts, electronic navigation equipment, and related publications helps alert pilots to the location of parachuting Drop Zones (DZ) and the need for extra caution in those areas. The FAA Aeronautical Information Services (AJV-5) collects, stores, and distributes static parachute jumping activities (PAJA) data for use in FAA publications, charts, and navigation databases.

航图、电子导航设备等相关出版内容上的跳伞标志。在航图、电子导航设备和相关出版内容上使用跳伞标志有助于飞行员了解降落区的位置，并提醒他们在这些区域需要格外小心。联邦航空局航空信息服务（以下简称 AJV-5）收集、存储和分发静态跳伞活动（以下简称 PAJA）数据，供联邦航空局出版内容、图表和导航数据库使用。

(1) Operators conducting parachute operations should report any additions, deletions, or changes to static PAJA data to the FAA air traffic control (ATC) facility with jurisdiction over the affected airspace. Operators should submit changes as outlined in part 105, § 105.15.

跳伞运营方应把对 PAJA 数据的任何添加、删除或更改报告给对受影响空域具有管辖权的空中交通管制部门。运营方应按照第 105 部分第 105.15 节的规定提交变更报告。

(2) ATC facilities that have jurisdiction over the affected airspace should report any additions, deletions, or changes to static PAJA data to AJV-5. At a minimum, include location; distance and radial from the nearest very high frequency omni-directional range (VOR); maximum altitude; DZ radius; day/time of use; and the ATC frequency. Submit static PAJA changes to the Aeronautical Data, National Flight Data Center (NFDC) website at: faa.gov/air_traffic/flight_info/ aeronav/Aero_Data/.

对受影响空域具有管辖权的空中交通管制部门应向 AJV-5 报告 PAJA 数据的任何添加、删除或更改。报告内容至少包括位置信息、相对最近的 VOR 的距离和所处于的径向线；最大高度；降落区半径；使用日期/时间；以及空中交通管制频率。PAJA 的变更可以提交至国家飞行数据中心（NFDC）网站（faa.gov/air_traffic/Flight_info/aeronav/Aero_Data/）。

4. BACKGROUND「背景」

a. Parachuting as an FAA-Recognized Aeronautical Activity. Sport parachuting (skydiving) continues to increase in popularity and is an FAA-recognized aeronautical activity even though parachutists are not certificated airmen. As an FAA-recognized aeronautical activity, regulations require airports that have received FAA funding to accommodate this activity unless the FAA determines that compatibility issues prohibit parachuting operations at a particular airport. FAA Order 5190.6, FAA Airport Compliance Manual, has more information regarding airport obligations.

作为联邦航空局认可的航空活动的跳伞运动。跳伞运动越来越受欢迎，尽管跳伞者并不是持证航空人员，但跳伞仍然是联邦航空局认可的航空活动。作为联邦航空局认可的航空活动，法规要求受到联邦航空局资助的机场协助这类活动的开展，除非联邦航空局认为特定机场由于与跳伞活动不兼容而不得进行降落伞作业。更多关于机场法规的信息，请参考：联邦航空局令 5190.6 - 联邦航空局机场合规手册。

b. Training, Licensing, and Instructor Rating. Sport parachuting has certain inherent risks for all participants. The FAA encourages sport parachutists to complete formal training courses offered by nationally recognized organizations or organizations that have equivalent training programs. The United States Parachute Association (USPA) is an FAA-accepted, nationally recognized skydiving organization that licenses skydivers in the United States. Many local skydiving clubs, schools, and drop zone operators (DZO) require documentation of experience and competency before using their equipment and/or parachuting facilities. This documentation usually consists of a logbook with endorsements and/or a skydiving license issued by a nationally recognized organization.

培训、执照和教练评级。跳伞运动对所有参与者都有一定的内在风险。联邦航空局鼓励跳伞者完成由国家认可的组织提供的正式培训课程，或者其他组织提供的同等课程。美国跳伞协会（USPA）是联邦航空局承认的、全

国认可的跳伞组织，为美国的跳伞者签发执照。许多地方跳伞俱乐部、学校和降落区运营方在跳伞者使用他们的装备和/或跳伞设施之前，需要跳伞者提供可证明跳伞经验和能力的文件。这些文件通常包括一本带受到背书的跳伞日志，和/或一张由国家认可的组织签发的跳伞执照。

c. Parachute Equipment. Parachuting as a sport depends on equipment manufacturers, materials suppliers, parachute riggers, government and military agencies, and other industry professionals. The Parachute Industry Association (PIA) is an international trade association that brings all of these interests together for the purpose of advancing the technology and safety of parachutes and parachuting activities. The PIA creates, publishes, and maintains materials, technical, and certification standards relating to parachutes, accessible on their web site: http://www.pia.com.

降落伞装备。跳伞运动依赖于装备制造商、材料供应商、降落伞装备师、政府和军事机构，以及其他行业的专家。降落伞工业协会（以下简称 PIA）是一个国际贸易协会，协会协调各相关方的利益，以提升降落伞装备和降落伞作业的技术和安全。PIA 创建、发布和维护与降落伞相关的资料、技术和认证标准，这些内容可在其网站（http://www.pia.com）上获得。

5. SKYDIVER SAFETY「跳伞者的安全」

a. Basic Safety Requirements (BSR). The USPA developed basic safety requirements and information for skydiving activities. These requirements and information are for training, checking equipment, and conducting a wide variety of sport parachuting activities. While not approved by the FAA, the BSRs are considered industry best practices and are widely accepted for use by individuals and parachute centers. The BSRs may be obtained from: The United States Parachute Association, 5401 Southpoint Centre Boulevard, Fredericksburg, VA 22407. The association's phone number is (540) 604-9740 and the USPA Web site is http://www.uspa. org. The FAA encourages skydivers to use facilities that conduct their operations in accordance with the USPA BSRs or other similar skydiving association best practices.

基本安全要求（BSR）。USPA 制定了跳伞活动的基本安全要求，并提供相关安全信息。这些要求和信息用于培训、装备检查和进行各类跳伞运动。虽然未受到联邦航空局的认证，BSR 被认为是行业最佳的实践成果，并被跳伞者和跳伞基地广泛接受使用。BSR 可从 USPA 获得。USPA 地址：USPA, 5401 Southpoint Centre Blvd. Fredericksburg, Virginia，邮编：22407。USPA 电话号码：（540）604-9740，USPA 网站：http://www.uspa. org。联邦航空局鼓励跳伞者在采纳 BSR 或其他类似跳伞协会的最佳安全实践成果的跳伞基地进行跳伞。

b. Medical Certificates. While the regulations do not require an FAA medical certification, the FAA urges prospective skydivers to receive a physical examination prior to their first jump and on a periodic basis thereafter. The skydiver should inform the physician of the purpose of the examination.

健康证明。虽然法规并不要求联邦航空局的健康证明，但联邦航空局敦促可能参加跳伞的人在首次跳伞之前和之后定期接受体检。且跳伞者应将检查的目的告知医生。

c. Training Methods. The skydiving industry has developed various methods of first-jump instruction. The FAA recommends that beginning skydivers seek instruction from instructors that have met the qualifications set forth by a nationally recognized parachuting organization.

培训方法。跳伞行业已经发展出各种针对首次跳伞的教学方法。联邦航空局建议跳伞新手向有资质的教练寻求指导（教练资质由国家认可的跳伞组织认定）。

d. Safety Devices and Equipment「安全装置和设备」

(1) Deployment Assist Device. Section 105.47 requires that all persons making a parachute jump with a static line attached to the aircraft and main parachute use an assist device to aid the pilot chute in performing its function. An assist device is also required if no pilot chute is used in direct deployment of a round, main parachute canopy. The regulations do not require an assist device for direct deployment of a ram-air main parachute canopy.

开伞辅助装置。第 105.47 节规定，所有使用系在飞行器和主降落伞之间的 Static Line 进行跳伞的人，都应使用辅助装置来协助引导伞执行其功能。对于直接打开的、没有使用引导伞的圆形主降落伞，也需要辅助装置。该节规定不要求使用辅助装置来直接打开冲压空气式主降落伞。

(2) Automatic Activation Device (AAD). An AAD is a self-contained mechanical or electromechanical device attached to the parachute container that automatically releases the parachute closing system when it meets specific parameters, such as exceeding a specific vertical velocity and being at or below a specific altitude. Parachutists may attach this device to the main, reserve, or both. However, it is normally only attached to the reserve. An AAD does not physically open the parachute container or deploy the canopy, but rather initiates the container opening by pulling the ripcord pin or by cutting the container closing loop, allowing the canopy to deploy in a similar manner as when pulling the ripcord manually.

自动激活装置（AAD）。AAD 是一种独立的机械或机电装置，安装在降落伞伞包内，可自动在预先设定的高度、速度等参数组合下，启动降落伞。跳伞者可以把这个装置连接到主伞或备伞上，或两者同时使用。但通常只用于备伞。AAD 不会直接打开降落伞伞包或打开降落伞，而是通过拉动降落伞拉索（一般指备伞拉索）一头的锁针（关包针）或切断关包绳来打开伞包，这使得降落伞的打开方式与手动拉动降落伞拉索（即拉动备伞把手）时的方式类似。

(a) The FAA requires that all tandem parachutes have an AAD installed on the reserve parachute. Many skydiving schools and clubs follow USPA BSRs and require the use of an AAD for all unlicensed skydivers.
联邦航空局要求所有双人伞都必须在备用降落伞上安装 AAD。许多跳伞学校和俱乐部遵循 USPA 的 BSR 相关规定，要求所有非持证跳伞者使用 AAD。

(b) The FAA has not established minimum operational performance standards (MOPS) or a TSO for AADs. Therefore, the FAA recommends that anyone using an AAD review manufacturer's reports conforming to the PIA Technical Standard TS-120, AAD Design and Testing Report Format, and independent third-party reports attesting to the AAD's performance standard in order to make an educated decision prior to the use of any particular make or model AAD. The FAA recommends that jumpers using AADs to satisfy the requirements set forth in part 105 purchase them from manufacturers who provide such reports. Each parachute manufacturer approves the installation of the AAD on their equipment.
联邦航空局还没有制定 AAD 的最低运行性能标准（MOPS）或技术标准规定（TSO）。因此，联邦航空局建议任何使用 AAD 的人查验制造商的报告（报告应符合 PIA 技术标准 TS-120 - "AAD 设计和测试报告格式"），以及可证明 AAD 性能标准的独立第三方报告，以便在使用任何特定品牌或型号的 AAD 之前做出明智的决定。联邦航空局建议，跳伞者从能够提供此类报告的制造商处购买 AAD，以满足第 105 部分的规定。各降落伞制造商也应对在他们制造的装备上安装的 AAD 进行认证。

(c) Users of AADs should be aware of the device's level of reliability and its operating limitations, be knowledgeable about the various parameters of the device, and be trained on the specific use and setting for the particular AAD. Users should be well informed about the use of the AAD and have access to the manufacturer's instructions.
AAD 用户应了解所使用的 AAD 的可靠性水平及操作限制，了解装置的各种参数，并接受特定 AAD 的具体使用和设置培训。用户应充分了解 AAD 的使用，并应能查阅制造商的说明。

(d) Users should understand that AADs are strictly backup devices and are not intended to replace training or timely manual execution of emergency procedures. AADs may or may not initiate reserve parachute deployment at a sufficient altitude, depending upon various combinations of circumstances.
用户应知道，严格来说，AAD 是备份装置，不能取代跳伞培训或取代紧急程序的及时手动执行。AAD 可能会也可能不会在足够的高度打开备用降落伞，这取决于不同情况的组合。

(e) Jumpers should make a pre-jump check using the manufacturer's recommended procedures for proper setting, arming, and operational status verification to ensure the proper functioning of the AAD. This pre-jump check is usually made prior to boarding the aircraft to ensure that it is set at the proper altitude and under current weather conditions to aid in accuracy. This is especially important when using an AAD that has selectable or adjustable activation settings, or when the intended landing area is at an elevation different from that of the departure airfield.
跳伞者应根据制造商建议的程序进行跳伞前检查，以确保 AAD 被正确设置，正确预位，并被确认其工作状态，以确保 AAD 正常运行。这种跳伞前检查通常在登机前进行，以确保它是在适当的高度和当前天气

条件下被设置的，这有助于装置准确运行。当 AAD 的激活条件是可选择或者可调节的时候，或者当预定着陆区域与起飞机场的高度不同时，这一点尤其重要。

(f) AADs may have selectable or adjustable altitude activation settings. Some AADs are preset for the intended type of operation (e.g., Tandem or Student), while others may be user-selectable. The model, version, and settings, must be appropriate for the particular type of equipment and jump. Different manufacturers may have different arming altitudes, as well as different activation altitudes and vertical speeds for the similar settings.

AAD 的激活高度可能是可选的或可调节的。一些 AAD 是为特定的跳伞类型（例如双人伞或学生跳伞）预设的，而其他一些 AAD 可以由用户自行选择模式。AAD 的型号、版本和设置必须适配特定类型的装备和跳伞类型。在相似的设置下，不同的制造商的 AAD 可能有不同的预位高度，不同的激活高度，以及不同的垂直速度激活条件。

(g) Since body position and other factors may cause a delay in the actual parachute opening altitude, the devices should only be used as a backup to manually deploying the reserve parachute. When the situation requires the use of the reserve parachute, the jumper should always manually pull the reserve ripcord using the established procedures for reserve deployment before ever reaching AAD activation altitude. The procedures for deployment of the reserve parachute are usually the same whether an AAD is installed or not.

由于身体姿态和其他因素可能导致实际降落伞打开高度的延迟，因此这些装置只能用作手动打开备伞的备份。当身处需要使用备伞的情形时，跳伞者应在落至 AAD 激活高度之前采取既定的备伞打开程序，手动拉动备伞把手。无论是否安装了 AAD，备伞的开伞程序通常是相同的。

(h) AAD malfunctions and activations should be reported to the AAD and container manufacturers, as well as to the USPA.

AAD 的故障和 AAD 的激活事件应向 AAD 制造商、伞包制造商以及 USPA 报告。

e. Weather. Strong or gusty winds can be dangerous, especially to student jumpers. In addition, skydivers and pilots should ensure adequate ceiling and visibility to maintain the required weather minimums.

天气。强风或阵风可能是危险的，特别是对学生跳伞。此外，跳伞者和飞行员应确保云底高度足够高，能见度足够大，以符合最低天气要求。

f. Parachute Landing Areas. The FAA recommends that areas used as parachute landing areas remain unobstructed, with sufficient minimum radial distances to the nearest hazard. The guidelines in the USPA's BSRs can be used in determining if the landing area is adequate.

降落伞降落区。联邦航空局建议用作降落伞着陆区的区域保持畅通无阻，与最近的危险障碍物的最小径向距离足够大。USPA 的 BSR 中的指南可用于确定着陆区域是否合适。

g. Water Safety Equipment. Flotation gear should be worn whenever the intended exit point or landing point of a skydiver is within 1 mile of an open body of water.

水上降落（水降）安全设备。当跳伞者的预计出舱点或着陆点处于开放水域 1 英里范围内时，应佩戴漂浮装置。

h. Advanced Parachuting. Many of the safety suggestions presented in this AC are intended primarily for the student parachutist, who should make all jumps in a controlled training environment. Individual experience and judgment dictate what additional training should be obtained before undertaking more advanced parachuting activities. All parachutists should acquire experience and training before using unfamiliar or high-performance equipment.

高性能伞。本资询通告中提出的许多安全建议主要针对跳伞学生，他们应该在可控的训练环境中完成所有的跳伞。个人经验和判断决定了在进行更高级的跳伞活动之前需要哪些额外的训练。所有跳伞者在使用不熟悉的或高性能的装备前都应有足够的经验和训练。

i. **Pre-Jump Equipment Checks.** The parachute system user has primarily responsibility for the airworthiness of his equipment at the time of use. Prior to each jump, the user should inspect his equipment for serviceability, including at least general condition, AAD serviceability (see subparagraph 5d(2)), pilot chute bridle routing, main and reserve pin seating, and Reserve Static Line (RSL) routing and connection.

跳前装备检查。降落伞系统的使用者对其装备在使用时的适航性负有主要责任。每次跳伞前，使用者应检查其

装备的可用性，检查应至少包括装备的总体情况、AAD 的可用性（见 5d（2））、引导伞系带的走线、主伞关包针和备伞关包针的情况、RSL 及其 RSL 的连接。

6. PARACHUTE OPERATIONS ONTO AIRPORTS「机场降落伞作业」

a. Stipulations for Landing at or Flying Over an Airport. Most parachute operations take place at airports, including having the parachute landing area located on the airport property. Section 105.23 requires approval from airport management prior to skydiving onto any airport. However, § 105.23(c) allows a parachutist to drift over an airport with an open parachute without airport management approval as long as the parachutist remains at least 2,000 feet above that airport's traffic pattern. Airport traffic patterns are generally 1,000 to 1,500 feet above ground level (AGL).

在机场降落或在机场上空飞行的相关规定。大部分的降落伞作业都在机场进行，且将降落区设在机场。第 105.23 节规定，在任何机场跳伞都需要事先得到机场管理部门的批准。然而，105.23（c）款规定允许跳伞者操纵已打开的降落伞在机场的飞机起落航线上方至少 2000 英尺的高度飞行，而无需机场管理部门的批准。机场的飞机起落航线通常在地面以上 1000 到 1500 英尺（AGL）。

b. Additional Aviation Activities. A large number of airports that accommodate parachute operations also have different kinds of aviation activities taking place simultaneously, including flight training, glider and helicopter operations, emergency medical services, sightseeing operations, and aerobatic practice over or in the immediate vicinity of the airport. Many airports accommodate a large volume of transient traffic during skydiving operations.

其他航空活动。许多进行降落伞作业的机场同时也进行着各种各样的飞行活动，包括飞行训练、滑翔机和直升机作业、紧急医疗服务、观光飞行，以及机场上空或附近的特技飞行训练。许多机场在降落伞作业期间还承载着大量的临时交通。

c. Shared Facility Airports. The FAA recommends that shared facility airports have operating procedures so that each activity can operate safely by knowing the procedures for each of the other activities. Representatives of each type of activity can operate more effectively by knowing the procedures for each of the other activities. Representatives of each type of airport user group should develop procedures specific to their activity and share these procedures with other user groups. Airport management must ensure that airport policies and procedures are kept current, which can be accomplished via regularly scheduled meetings with all airport user groups.

共用设施机场。联邦航空局建议共用设施机场建立相关运营程序，以使得不同航空活动的参与者能够对其他航空活动有所了解，从而保证不同的航空活动都能安全运行。不同航空活动的代表人都可以通过了解其他航空活动的程序来使得自己的航空活动更有效地运作。各类型的机场用户的代表人应制定自身航空活动的具体程序，并与其他类型的机场用户分享这些程序。机场管理部门必须确保机场政策和运营程序是最新的，为了达成这一点，机场管理部门可以与所有不同类型的机场用户定期举行会议。

(1) Traffic Patterns. With a minimum parachute opening altitude of 2,000 feet AGL (most parachutists open much higher), parachutes are nearly always open 800 feet or more above the traffic pattern altitude for any airport. Parachutes descend relatively slowly and are easy for pilots to acquire visually.

飞机的起落航线。最低降落伞打开高度为 2000 英尺（大多数跳伞者开伞的高度要高得多），降落伞完全打开的高度一般高于任何机场的起落航线至少 800 英尺。降落伞下降速度相对较慢，飞行员很容易看到降落伞。Parachutists and pilots have a shared responsibility to see and avoid each other. Refer to the current edition of AC 90-66, Recommended Standard Traffic Patterns and Practices for Aeronautical Operations at Airports without Operating Control Towers, for information on traffic patterns and parachute operations.

跳伞者和飞行员都共同的责任去注意和避开对方。有关起落航线和降落伞作业的信息，请参阅 AC 90-66 –“没有运行中的塔台的机场的航空运营的建议标准起落航线和规范”的最新版本。

(2) Parachute Landings on Airports. Airports may designate suitable parachute landing areas. While skydivers attempt to land in such areas, at times there may be inadvertent landings in other grass or hard-surfaced areas. This could include landings on runways, taxiways, and other hard-surfaced areas. Areas such as runways, taxiways, clearways, and Obstacle Free Zones (OFZ) are not prohibited areas but should not be designated as a primary landing area and should be vacated as soon as practical. Flying a parachute over runways at low

altitudes should be avoided where possible. The FAA recommends that airport management work with parachute operators to develop standard operating procedures (SOP) for activities conducted by parachutists. Airports that receive or have received Federal funding or grant assurances may have additional requirements or restrictions to parachute landing areas. For additional information, see the current editions of FAA Order 5190.6, FAA Airport Compliance Manual, AC 150/5190-7, Minimum Standards for Commercial Aeronautical Activities; and AC 150/5300-13, Airport Design. 7

降落伞在机场着陆。机场可指定合适的降落伞降落区。当跳伞者试图在降落区着陆时，有时可能会无意中落到其他草地或硬地。这些地方可能包括跑道、滑行道和其他硬地区域。跑道、滑行道、净空区和无障碍区（OFZ）等区域不是禁止区域，但不应指定为主要的降落伞降落区，这些区域被占用时应尽快清空。降落伞应尽可能避免低空飞越跑道。联邦航空局建议机场管理部门与跳伞运营方合作，为跳伞人员的活动制定标准操作程序（SOP）。受到或受到过联邦资助的机场可能对降落伞降落区有额外的要求或限制。更多有关信息，请参阅最新版本的联邦航空局 5190.6 令–“联邦航空局机场合规手册”，以及 AC 150/5190-7–“商业航空活动的最低标准”，以及 AC 150/5300-13 –“机场设计”

7. JUMP AIRCRAFT MAINTENANCE AND JUMP PILOTS「降落伞作业飞行器的维护和进行作业的飞行员」

Whenever flights are offered for compensation or hire, the flight is considered a commercial operation under part 91, and Federal regulations require:

当航班被用来赚取报酬或租金时，根据第 91 部分规定，该航班被视为商业运营，联邦法规要求：

a. Aircraft Inspections. The operator must ensure the aircraft is maintained in accordance with part 91, § 91.409 as applicable:

飞行器的检查。运营商必须确保飞行器按照第 91 部分第 91.409 节规定（如适用）进行维护：

(1) Section 91.409 (a) and (b), annual and 100-hour inspection programs;
第 91.409（a）和（b），年度检查和 100 小时检查；

(2) Section 91.409 (d), progressive inspection program;
第 91.409（d），渐进式检查；

(3) Section 91.409(f)(3), manufacturer's inspection program; or
第 91.409（f）（3），制造商检查；或

(4) Section 91.409(f)(4), approved inspection program.
第 91.409（f）（4），批准的检查。

b. Aircraft Inspection Quality Assurance (QA). Aircraft operated commercially under part 91 must be inspected by a person authorized to perform inspections under a 100-hour/annual program or an FAA- approved progressive inspection program consistent with the requirements for part 91 operations. Operators must maintain aircraft operated under 14 CFR part 125 or 135 under an FAA-approved maintenance program. The FAA recommends the use of an aircraft status sheet for QA.

飞行器检查质量保证（QA）。根据第 91 部分规定进行商业运营的飞行器必须由授权人员进行检查，该人员需获得 100 小时检查或年度检查的授权，或有联邦航空局批准的、符合第 91 部分规定的渐进式检查授权。在联邦航空局批准的维护计划下，运营方必须根据 14 CFR 第 125 或 135 节规定维护飞行器。联邦航空局建议使用飞行器状态表来进行质保。

c. Additional Information on Acceptable Maintenance Programs. Anyone conducting parachuting operations should contact his or her local FAA Flight Standards District Office (FSDO) for additional information on acceptable maintenance programs. Reviewing aircraft maintenance records can be simplified by the use of an aircraft status sheet (see AC 105-2E, Figure 1, FAA Aircraft Status Inspection List Example).

其他关于可接受的维护计划的信息。任何进行降落伞作业的人都应联系当地联邦航空局飞行标准办公室（FSDO），以获得更多关于可接受的维护计划的信息。使用飞行器状态表可以简化对飞行器维护记录的审查（参见咨询通告 AC 105-2E 的图 1，联邦航空局飞行器状态检查表示例）。

FIGURE 1. FAA AIRCRAFT STATUS INSPECTION LIST EXAMPLE

图 1 联邦航空局飞行器状态检查表示例

N 名称	S/N 序列号	A/C Make and Model (M/M) 飞行器品牌和型号（M/M）

Name of Airframe and Powerplant (A&P), Inspection Authorization (IA) or FAA Repair Station responsible for the inspection of the aircraft:
飞行器机身和动力装置机械师（A&P）、检查授权人（IA）或负责检查的联邦航空局维修站的名称：

A&P or IA Certificate No. or Repair Station No.:
A&P 或 IA 证书编号或维修站编号：

Inspection/Item Pending 待检查内容/项目	Hours/Date 时间/日期		Next Due 下次到期日期
Annual or Progressive Inspection 年度或渐进式检查			
100-Hour Inspection 100 小时检查			
Static System Check Static 系统检查			
Altimeter Check 高度表检查			
Transponder Check 应答机检查			
Emergency Locator Transmitter (ELT) Battery 紧急定位发射器（ELT）电池			
Airworthiness Directive (AD) Number 适航指令（AD）编号	Description 说明	Hours/Date Completed 完成时间/日期	Next Due 下次到期日期

8. PILOT RESPONSIBILITIES.「飞行员职责」

The pilot in command (PIC) must adhere to all regulations applicable to the operation conducted. This includes, but is not limited to, the following:

机长必须遵守适用于所进行的航空作业的所有规定，包括但不限于以下内容：

a. Pilot Certification, Experience, and Operating Requirements. The PIC is responsible for meeting the certification, proficiency, operating, and experience requirements of, but not limited to, 14 CFR parts 61, 91, and 105. Pilots conducting flight operations for compensation or hire are required to possess a Commercial Pilot Certificate with the appropriate ratings for the aircraft being flown and must have a current Class 2 medical certificate or equivalent.

飞行员证书、经验和作业要求。机长应满足（但不限于）14 CFR 第 61、91 和 105 部分的证书、熟练程度、操作和经验要求。为赚取报酬或租金而进行飞行作业的飞行员必须持有与所驾驶飞行器等级相适应的商业飞行员证书，并且必须持有有效期内的二级健康证明或等效证明。

b. Jump Pilot Training. For those DZOs and parachuting operations that do not have a nationally recommended jump pilot training program, the FAA recommends that pilots flying aircraft for the purpose of sport parachuting have appropriate initial and recurrent training. The training program should include testing to ensure a high level of competence in the jump aircraft being flown. The training should include at least the following:

跳伞作业飞行员的训练。对于那些没有国内建议的跳伞作业飞行员培训计划的跳伞降落区运营方和跳伞作业，联邦航空局建议对为跳伞运动而驾驶飞行器的飞行员进行适当的初始和定期训练。培训内容应包含考试，以确保对跳伞用飞行器的高水平驾驶能力。培训应至少包括以下内容：

(1) Ground Training.

地面训练。

(a) Preflight inspection specific to jump aircraft and modifications.
针对跳伞作业飞行器和改装部位的飞行前检查。

(b) Aircraft limitations.
飞行器的限制。

(c) Weight and Balance (W&B).
重量和平衡（W&B）。

1. Takeoff computations.
   起飞重量计算。
2. Weight shift in flight procedures for exiting jumpers.
   飞行程序中，跳伞者出舱时的飞机重心转移。
3. Landing configuration.
   着陆设置。

(d) Low-speed operations for jump runs.
跳伞航线上的低速操作

1. Maneuvering at minimum speed.
   以最低速度飞行。
2. Opening and closing jump door, if applicable.
   打开和关闭舱门（如适用）。
3. Stall recognition and recovery.
   失速的识别和恢复。

(e) Emergency procedures.
紧急程序。

1. Standard aircraft emergencies.
   标准的飞行器紧急情况。
2. Emergencies caused by jump activities.
   跳伞活动引起的紧急情况。
3. Bailout procedures.
   援助程序。

(f) Aircraft airworthiness determination.

飞行器适航性的确定

1. Maintenance requirements and procedures.
   飞行器的维护要求和维护程序
2. Aircraft Status Inspection List (Figure 1).
   飞行器状态检查表（图 1）
3. Minimum equipment list (MEL), if applicable.
   最低要求设备清单（MEL），如适用
4. Logging maintenance discrepancies.
   记录维护的差异

(g) Parachute packing in compliance with § 105.43.
降落伞的叠伞符合 105.43 节的规定。

(h) Drop zone surface and airspace familiarization.
熟悉跳伞降落区地面和空域。

(i) Descent Procedures.
下降程序。

1. Aircraft best-glide speed for engine failure.
   飞行器发动机故障时的最佳滑翔速度。
2. AAD activation considerations with skydivers onboard.
   将舱内跳伞者的 AAD 被激活的情况考虑在内。

(2) Flight Training.

飞行训练

(a) Takeoffs and landings with representative loads.
搭载测试负载进行起降。

(b) Center of gravity (CG) shift with jumper exit.
跳伞者出舱后的重心（CG）移动。

(c) Stall-spin prevention and recovery.
失速螺旋的预防和恢复。

(d) Configuration for jump run and jumper exit including procedures for tail strike avoidance
为跳伞航线和跳伞者出舱而进行的配置，包括避免跳伞者撞上机尾的程序

(e) Skydive aircraft formation flying (if applicable), in accordance with USPA Formation Flying 101 guidance.
跳伞作业飞行器的编队飞行（如适用），应与 USPA 编队飞行指南 101 的规定一致。

c. W&B Procedures. The PIC is solely responsible for assuring that the aircraft being flown is properly loaded and operated so that it stays within gross weight and CG limitations. The PIC should obtain additional aircraft station position information (loading schedule) for future W&B computations. The PIC is also responsible for reviewing these records and the flight manual to gain familiarity with an aircraft's W&B procedures and flight characteristics.
重量和平衡（W&B）程序。机长全权负责确保要驾驶的飞行器正确装载负荷和正确操作，使其符合总重和重心的限制。机长应该为未来的重量和平衡的计算获取额外的飞行器位置信息（装载计划）。机长还负责审查这些记录和飞行手册，以熟悉飞行器的重量和平衡程序和飞行特性。

d. Computing W&B. The PIC must include the following factors:
重量和平衡的计算。机长必须考虑以下因素：

(1) The maximum allowable gross weight and the CG limitations.
允许的最大总重，以及重心限制。

(2) The currently configured empty weight and CG location.
当前配置下的空重，以及重心位置。

(3) The weight and CG location prior to each flight.
每次飞行前的重量，以及重心位置。

(4) The weight and location of jumpers during each phase of the flight in order to ensure that the aircraft stays

within CG limits. The PIC must remain aware of CG shifts and their effects on aircraft controllability and stability as jumpers move into position for exiting the aircraft and as they exit.

飞行的每个阶段中跳伞者的重量和所在位置，以保持飞行器的重心在许可范围内。机长必须时刻注意重心的移动及其对飞行器操纵性和稳定性的影响，因为跳伞者在准备离开飞行器和离开飞行器时都会使飞机重心改变。

e. Operational Requirements. The PIC is solely responsible for the operational requirements of parts 91 and 105, including compliance with the special operating limitations and placards required for flight with the door open or removed. The PIC is also responsible for ensuring that each occupant has been briefed on operation of his or her restraint system, procedures for ensuring aircraft W&B stays within limits while jumpers exit, and procedures to avoid tail strikes.

操作要求。机长对遵守第 91 和 105 部分的操作要求负有全部责任，包括舱门被打开或移除时，飞行器飞行的特殊操作限制和标识要求。机长还负责确保向每位乘客简要介绍其安全带系统的操作，跳伞者出舱时确保飞行器的重量和平衡保持在限制范围内的程序，以及避免跳伞者撞击机尾的程序。

f. Suitable Placards. Placards should be located in the aircraft to help the pilot inform jumpers of the maximum approved loading and weight distribution. These placards should be located where anyone boarding the aircraft can see them. They should also clearly show the maximum approved seating capacity and the load distribution.

合适的标识。应在飞行器上放置标识，以提醒跳伞者最大允许载荷和重量分布。这些标识应该置于所有登机者都能看到的地方。它们还应清楚标明许可的最大座位数和荷载分布。

g. Seatbelts and Approved Loading. Section 91.107(a)(3)(ii) permits persons aboard an aircraft for the purpose of participating in sport parachuting activities to use the floor of the aircraft for a seat. However, among jump aircraft there are a wide variety of seats, benches, troop seats, and floor seating arrangements. In all cases, each person must have access to an installation-approved seatbelt. See Appendix 3, Seats and Restart Systems, for additional information describing seat and restraint system configurations. The maximum number of skydivers is determined by that aircraft's W&B limitations, as long as there is a seatbelt or restraint for each skydiver. The approved number of skydivers that each aircraft can carry for parachute operations will most commonly be found on FAA Form 337, Major Repair and Alteration (Airframe, Power plant, Propeller, or Appliance), used for field approvals, or an aircraft Supplemental Type Certificate (STC).

安全带和载荷许可。91.107（a）（3）（ii）允许为参加跳伞运动而乘坐飞行器的人使用飞行器地板作为座位。然而，不同的跳伞作业飞行器有各种各样不同的座位、长凳、部队座位和地板座位安排。在任何情况下，每个人都应配有被批准安装在飞行器上的安全带。有关座椅和安全带系统配置的更多信息，请参见附录 3“座位和安全带系统”。只要每个跳伞者都配有安全带系统，那么跳伞者的最高人数就仅取决于飞行器的重量和平衡限制。在降落伞作业中，每架飞行器允许搭载的跳伞者数量一般可参考用于现场审批的联邦航空局 337 表格—“飞行器的重大维修和改造（机身、动力装置、螺旋桨或设备）”，或飞行器补充型号证书（STC）。

h. Oxygen. Pilots must use oxygen when flying above 14,000 feet mean sea level (MSL). Operators must provide oxygen to occupants when the jump plane is above 15,000 feet MSL. Above 25,000 feet MSL, occupants should use pressure-demand oxygen systems. High-altitude jumps should be made only after becoming familiar with the problems and hazards created by low temperatures, lack of oxygen, and the various types of oxygen equipment. Jumpers should not attempt high-altitude jumps without an adequate supply of breathing oxygen (refer to § 91.211). Also, pilots must use oxygen while flying between 12,500 to 14,000 feet MSL for a duration of over 30 minutes.

氧气。当飞行高度超过海拔 14000 英尺时，飞行员必须吸氧。当跳伞作业飞行器高度超过 15000 英尺时，运营方必须向乘客提供氧气补充。在海拔 25000 英尺以上，机内人员应使用加压供氧系统。进行超高空跳伞前，必须先熟悉低温、缺氧和各种氧气设备造成的问题和危险之后。如果没有足够的氧气供应，跳伞者不应尝试超高空跳伞（参见第 91.211 节）。此外，飞行员在海拔 12500 至 14000 英尺飞行超过 30 分钟时，也必须吸氧。

i. Altitude Reporting. Pilots report altitudes in feet above MSL.

高度报告。飞行员报告的高度应为海拔高度，单位为英尺。

9. PARACHUTE OPERATIONS IN DESIGNATED AIRSPACE. 「在指定空域进行降落伞作业」

Section 105.25 contains information on the ATC authorization and notification process (see Appendix 1, Table of Location of Jump Authorization or Notification).

第 105.25 节包含有关空中交通管制授权和通知过程的信息（见附录 1—“跳伞地点的授权或通知”）。

a. Parachute Operations Restrictions.「降落伞作业的限制」

No person may conduct a parachute operation, and no PIC of an aircraft may allow a parachute operation to be conducted from that aircraft:

在以下情况下，任何人不得进行降落伞作业，任何飞行器的机长也不得允许在该飞行器上进行降落伞作业：

(1) Over or within a restricted or prohibited area, unless the controlling agency of the area concerned has authorized that parachute operation;
在限制区或禁区的上空或区内，除非有关区域的管理机构已授权进行降落伞作业；

(2) Within or into a Class A, B, C, or D airspace area without, or in violation of the requirements of, an ATC authorization issued under § 105.25; or
在未经空中交通管制授权，或违反根据 105.25 节签发的空中交通管制授权的情况下，在 A、B、C、D 类空域内或进入这些空域进行降落伞作业；或者

(3) Within or into a Class E or G airspace area (except as provided in subparagraphs 9c and 9d), unless the ATC facility that has jurisdiction over the airspace at the first intended exit altitude receives notification of the parachute operation no earlier than 24 hours before and no later than 1 hour before the parachute operation begins.
除 9c 和 9d 款的规定外，在 E 或 G 类空域内或进入这些空域进行降落伞作业，除非对第一次预定离机高度所处空域具有管辖权的空中交通管制部门在降落伞作业开始 24 小时之内或不迟于作业开始 1 小时前接到降落伞作业的通知。

b. Request for a Parachute Operation Authorization or Notification. Submit each request for a parachute operation authorization or notification required under this section to the ATC facility that has jurisdiction over the airspace at the first intended exit altitude and include the information prescribed by § 105.15(a).
降落伞作业的授权或通知的请求。应将该节要求的降落伞作业的授权或通知的请求提交给对第一次预定离机高度所处空域具有管辖权的空中交通管制部门，并在内容中包含第 105.15（a）款规定的信息。

c. Notification of Parachute Operations. For the purposes of subparagraph 9a(3), ATC facilities may accept a written notification from an organization that conducts parachute operations and lists the scheduled series of parachute operations over a period of time not longer than 12 calendar-months. The notification must contain the information prescribed by § 105.15(a) (see Appendix 1).
降落伞作业的通知。就第 9a（3）款而言，空中交通管制部门可接受开展降落伞作业的机构的书面通知，其中列出可一系列降落伞作业计划，时间跨度不得超过 12 个日历月。通知必须包含第 105.15（a）条规定的信息（见附录 1）。

d. Armed Force. Subparagraph 9a(3) does not apply to a parachute operation conducted by a member of a Department of Defense (DOD) armed force within a restricted area that extends upward from the surface when that area is under the control of the DOD armed force.
军队。第 9a（3）款不适用于国防部武装部队成员在国防部武装部队控制的限制区域上空展开的降落伞作业。

10. JUMPS OVER AND INTO CONGESTED AREAS AND OPEN-AIR ASSEMBLIES OF PERSONS「飞越并进入拥挤区域和露天人群聚集区」

a. Off-Airport Jumps. A skydiver may make parachute jumps away from the usual on-airport parachute school, club, or center location, as long as landowner permission is obtained for the off-airport location.
机场外的跳伞。跳伞者可在降落伞学校、跳伞俱乐部或跳伞中心（通常都设在机场内）以外的地点进行跳伞，只要获得相应土地所有者的许可。

b. Certificate of Authorization (COA). Section 105.21(a) requires an FAA COA in order to conduct a parachute operation over or into a congested area of a city, town, or settlement, or an open-air assembly of persons. The

responsible person of the proposed jump must obtain this COA from the FAA FSDO that has jurisdiction over the site where the jump is proposed by submitting an application, FAA Form 7711-2, Certificate of Waiver or Authorization Application. A copy of FAA Form 7711-2 and information on filling out this form can be obtained from the local FSDO or downloaded from http://www.faa.gov. An application for a COA should be submitted at least 10 working days in advance of the intended jump date to allow time for processing. Approval or denial of the application must be completed within 5 working days of receipt by the FSDO.

授权证书（COA）。第 105.21（a）节规定，要在城市、城镇或居民点或露天人员集会区域上空或进入该区域进行降落伞作业，须先获得联邦航空局的授权证书。这类降落伞作业的负责人应向对跳伞地点具有管辖权的当地联邦航空局飞行标准办公室填写提交 7711-2 表格—“豁免或授权证书的申请”，以获得授权证书。7711-2 表格的副本和填写此表格的相关信息可从当地的飞行标准办公室获得，或从 http://www.faa.gov 下载。授权证书的申请应至少提前 10 个工作日提交，以便有足够时间进行处理。当地飞行标准办公室在收到申请后 5 个工作日内必须完成申请的处理，决定是否批准。

11. AUTHORIZATION AND NOTIFICATION REQUIREMENTS FOR PARACHUTE OPERATIONS.「降落伞作业的授权和通知要求」

Whether regulations require verbal or written authorization or a COA (FAA Form 7711-1, Certificate of Waiver or Authorization) for a parachute operation depends upon the type of airspace involved and the area where the parachutist intends to land. The airspace and landing area will determine the requirements. Parachutists and pilots can use Appendix 1 to determine what authorization or notification requirements are necessary for various types of jumps. The FAA recommends that anyone establishing a permanent drop zone or a temporary jump site contact the ATC facilities nearest the site as early as possible. ATC personnel are in the best position to provide information on arrival and departure routes, airspace classifications, and other airspace operations that may affect the safe and efficient flow of a parachuting operation. If you are uncertain of the requirements after looking at Appendix 1, contact your local FSDO and/or ATC facility for additional information.

法规是否要求降落伞作业口头或书面授权，或是否要求授权证书（联邦航空局表格 7711-1，豁免或授权证书），取决于所涉及的空域类型和跳伞者打算降落的区域。要求的内容取决于空域和着陆区域。跳伞者和飞行员可以使用附录 1 来确定各类跳伞需要什么样的授权或通知要求。联邦航空局建议，任何建立长期跳伞降落区或临时跳伞场地的人应尽早与离跳伞场地最近的空中交通管制部门联系。空中交通管制人员是获取起降路线、空域分类和其他可能影响跳伞安全和有效进行的空域活动的信息的最佳渠道。如果查看附录 1 后仍不确定要求，请联系当地的飞行标准办公室和/或空中交通管制部门，以获取更多信息。

12. EXHIBITION JUMPS AT OFF-AIRPORT LOCATIONS「在机场外进行的演示跳伞」

a. Parachute Landing Areas. The FAA requires the following size areas when issuing a COA for parachuting operations conducted over or into a congested area or an open air assembly of persons.

降落伞着陆区。联邦航空局仅向符合下列条件的区域发放在人员拥挤区域或露天集会上空进行跳伞作业的授权证书。

(1) Open Field. An open area, no less than 500,000 square feet (e.g., approximately 710 feet by 710 feet, or dimensions with a sum total that equals or exceeds 500,000 square feet) that will accommodate landing no closer than 100 feet from spectators. Allows a jumper to drift over the spectators with sufficient altitude (250 feet) so as to not create a hazard to persons or property on the ground.

开阔场地。面积不小于五十万平方英尺（例如，大约 710 英尺×710 英尺，或面积总和等于或超过五十万平方英尺的区域），允许跳伞者在距离观众至少 100 英尺的地方着陆，以及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。

(2) Level I. An open area that will accommodate a landing area no smaller than 250,000 square feet (e.g., approximately 500 feet by 500 feet, or dimensions with a sum total that equals or exceeds 250,000 square feet) and which will accommodate landing no closer than 50 feet from spectators. Allows a jumper to pass over the spectators no lower than 250 feet, including the canopy and all external paraphernalia. Many open field athletic

areas and airport operational areas constitute Level I landing areas.

一级区域。着陆区域不小于二十五万平方英尺（例如，大约 500 英尺×500 英尺，或面积总和等于或超过二十五万平方英尺），允许跳伞者在距离观众至少 50 英尺的地方着陆，以及允许一名跳伞者在不低于 250 英尺的高度飞越观众，包括其降落伞伞翼和所有外部附件。许多开阔运动场地和机场运行区域都可作为一级区域。

(3) Level II. An open area that will accommodate a rectangular, square, oval, or round-shaped landing area of approximately 5,000 square feet for no more than four jumpers, with at least 50 feet in width. Also accommodates an additional 800 square feet minimum for each additional jumper over four for any jumper landing within 30 seconds of the last of any four jumpers. This permits jumpers to land no closer than 15 feet from spectators and to pass over the spectators no lower than 50 feet including the canopy and all external paraphernalia.

二级区域。可容纳一个矩形、方形、椭圆形或圆形区域作为着陆区的开阔区域，面积约为五千平方英尺，供不超过四名跳伞者使用，且宽度至少为 50 英尺。此外，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，还必须增加至少八百平方英尺的额外空间。跳伞者可被允许在离观众至少 15 英尺的地方着陆，并在不低于 50 英尺的高度飞越观众，包括其降落伞伞翼和所有外部附件。

(4) Stadium. A level II landing area smaller than 450 feet in length by 240 feet in width and bounded on two sides or more by bleachers, walls, or buildings in excess of 50 feet high.

体育场。体育场是长度小于 450 英尺，宽度小于 240 英尺的二级着陆区，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。

(5) Other Landing Area Considerations.「其他着陆区」

(a) A landing area that exceeds the maximum dimensions of a Level I landing area, that permits a parachutist to drift over a congested area or open air assembly with a fully deployed and properly functioning parachute (if the parachutist is at sufficient altitude to avoid creating a hazard to persons and property on the ground) and that has no other safety concerns would likely not require a COA as required by § 105.21.

如果一个区域符合以下条件：着陆区域尺寸超过一级着陆区所要求的最大尺寸，允许跳伞者操纵完全打开且可正常控制的降落伞在人员拥挤区域或露天集会上空飞行，（如果高度足以避免对地面人员和财产造成危害），并且没有其他安全问题，则在这个区域进行跳伞作业可能不需要提供 105.21 节规定的授权证书。

(b) Any parachute jumping demonstration planned in conjunction with a public aviation event will require a COA with appropriate special provisions as required by § 105.21, even if the landing area exceeds the maximum dimensions for a Level I area. A parachute jumping demonstration planned in conjunction with a public aviation event is one that takes place any time after the first spectator arrives for the event that day.

计划与其他公开航空活动一起进行的任何演示跳伞，都需要按照 105.21 节规定，获得带有适当的特殊条款的授权证书，即使着陆区域尺寸超过一级区域所要求的最大尺寸。计划与其他公开航空活动一起进行的演示跳伞，指的是在当天第一名观众到达后任何时候进行的演示跳伞。

(6) Tandem Jump Demonstrations.「双人伞跳伞表演」

Only tandem instructors, rated by the USPA or authorized by the FAA General Aviation and Commercial Division (AFS-800), Federal Aviation Administration, Flight Standards Service, 800 Independence Avenue, SW, Washington, DC 20591 may conduct tandem demonstrations. Tandem jumps may be authorized as follows:

双人伞教练须符合这些条件才能进行双人伞跳伞表演：持有 USPA 相关评级，或者得到联邦航空局通用航空和商业部（AFS-800）授权（地址：飞行标准处，华盛顿特区西南独立大道 800 号，邮编 20591）。符合以下要求的双人伞跳伞表演可获得授权：

(a) Tandem jumps into open field and Level I landing areas do not require any previous jump experience for the passenger.

在空旷区域和一级着陆区域着陆的双人伞跳伞不要求乘客有任何跳伞经验。

(b) Tandem jumps into Level II areas require the passenger to have a USPA category D license with a Professional Exhibition Rating (PRO)

在二级区域着陆的双人伞跳伞要求乘客持有 USPA D 执照，并持有专业（PRO）评级。

(7) Alternate Landings Areas.「备降场」

Regardless of the parachutists' experience, "runoffs" or escape areas must be identified.

无论跳伞者的经验水平如何，都必须确定可供备降的场地。

(8) Intentional Cutaway. Cutaways may not be performed if the cutaway equipment will drift into the spectator area.

刻意的切伞。如果切伞相关装备可能飞入观众区，则不得进行切伞。

b. Qualification and Currency Requirements. In addition to landing area size requirements, the FAA also imposes qualification and currency requirements. The FAA recognizes and accepts USPA licenses and ratings found in the parachutist's license and recent experience requirements that are established in the current edition of FAA Order 8900.1, Flight Standards Information Management System (FSIMS), Volume 3, Chapter 6, Section 1, Issue a Certificate of Waiver or Authorization for an Aviation Event, located at http://fsims.faa.gov. In accordance with Order 8900.1, parachutists and instructors who are not members of the USPA and who wish to participate in a demonstration or exhibition jump over or into a congested area must present satisfactory evidence of the experience, knowledge, and skill equivalent to that required by the USPA and must have a letter of approval from AFS-800.

资格和有效期要求。除了着陆区大小的要求，联邦航空局还制定了资格和有效期的要求。联邦航空局认可并接受 USPA 执照和以及执照中列出的评级，以及联邦航空局 8900.1 号令—"飞行标准信息管理系统（FSIMS）"的最新版本的第 3 卷第 6 章第 1 节—"为航空活动签发豁免或授权证书"中规定的近期跳伞经验要求（可在 http://fsims.faa.gov 上找到该信息）。为符合联邦航空局 8900.1 号令的要求，非 USPA 会员的跳伞者和教练如果想参加在人员拥挤区域上空进行的或飞入人员拥挤区域的演示跳伞或表演，必须提供令人信服的经验证明，以表明其拥有符合 USPA 要求的同等的知识和技能，且必须有 AFS-800 的批准信。

13. PARACHUTE EQUIPMENT RULES「降落伞装备规定」

a. Parachute. Title 14 CFR part 1, § 1.1 defines a parachute as a device used, or intended to be used, to retard the fall of a body or object through the air. For the purposes of this AC, a parachute assembly normally, but not exclusively, consists of the following major components: a canopy, a deployment device, a pilot chute and/or drogue, risers, a stowage container, a harness, and an actuation device (ripcord). There are, of course, some lesser parts associated with these major components such as connector links, bridles, and hardware. The term "pack," when used in this AC, refers to the complete harness-container system, including the main parachute container, plus the reserve parachute and associated components. Except for an RSL (if installed), it does not include the main canopy, main risers, or components that depart with the main canopy if it is jettisoned. If a container is designed to be easily disconnected from its harness (for storage or transport, for example), the term "pack" refers to the container/canopy assembly by itself, without the harness.

降落伞。14 CFR 第 1 部分 1.1 节将降落伞定义为用于或打算用于缓冲人员或物体在空气中的下落的装置。本咨询通告所指的降落伞通常（但不限于）由以下主要部件组成：降落伞伞布，开伞装置，引导伞或减速伞，组提带，伞包，背带，以及动作装置（拉索）。当然，还有一些这些主要部件相关的较小组件，如（伞绳与组提带的）连接器"Connector Links"，引导伞系带"Bridles"，以及一些金属部件。本咨询通告所提到的"套/套装"，是指完整的背带和伞包系统，包括主伞伞包，以及备伞和其相关组件。除了 RSL（如已安装）外，"套/套装"不包括主伞、主伞组提带或切伞后与主伞一起分离的部件。如果一个伞包被设计成很容易与背带断开连接（例如，为了储存或运输），则"套/套装"指的是伞包/降落伞伞布本身，而不包含背带。

（译者注：根据"降落伞装备师手册"，术语"Pack"，上文译作"套/套装"，与"Container"，即伞包，互为同义词，可等效使用。对于当今大多数降落伞，背带和伞包是绑定的，不可拆分，因此一般统称为"背带和伞包系统"，但早期许多降落伞的背带和伞包是可拆分的。因此，上文对"Pack"，即"套/套装"在这两种语境下的不同含义作了区分）

b. Parachute Harness. Section 105.43 requires a solo parachutist making an intentional jump wearing a single-harness dual-pack parachute to have at least one main parachute and one approved reserve parachute. For tandem jumps, the parachute system defined in § 105.3 includes a main parachute, a reserve parachute, a harness and dual

parachute container, an AAD, and a forward harness for a passenger parachutist. For both solo and tandem parachutists, the harnesses (including the forward harness of a tandem system) and reserve parachute packs must be approved types, but the main parachutes do not need approval. The following are examples of approved parachutes as defined in §105.3:

降落伞背带。105.43 节要求一名单人跳伞者在跳伞时，必须使用单背带双套降落伞，以至少有一个主伞和一个经批准认证的备伞。对于双人伞，§105.3 中定义的降落伞系统包括主伞、备伞、背带、双降落伞伞包、AAD，以及供双人伞乘员使用的前背带。对于单人跳伞者和双人伞跳伞者，背带（包括双人伞系统的前背带）和备伞套装都必须是获批准认证的类型，但主伞不需要批准认证。以下是 105.3 节中定义的经批准的降落伞的示例：

(1) Parachutes Manufactured under TSO-C23. This TSO prescribes the minimum performance and QA standards for personnel parachutes that are carried aboard civil aircraft or by skydivers for emergency use, including reserve parachutes used for intentional jumps. The manufacturer must meet these standards before labeling its parachute or components as complying with the TSO.

根据 TSO-C23 标准制造的降落伞。该技术标准规定（TSO）规定了民用飞行器上的或跳伞者紧急情况下使用的降落伞的最低性能和质量保证标准，包括用于有意跳伞的备伞。制造商在将降落伞或其组件标识为符合技术标准规定之前，必须先满足这些标准。

(2) Demilitarized or Military Surplus Parachutes. Military personnel-carrying parachutes (other than high-altitude, high-speed, or ejection kinds) identified by military drawing number, military order number, or any other military designation or specification. These parachutes are often referred to as demilitarized or military surplus parachutes.

去军事化的或军队多余的降落伞。指可用于搭载军队人员的降落伞（除高空、高速或弹射类型外），这些降落伞由军用图纸编号、军用订单编号或任何其他军用指定或规格所标识。这些降落伞通常被称为去军事化的或军队多余的降落伞。

c. Assembly of Major Components. The assembly or mating of approved parachute components from different manufacturers may be made by a certificated, appropriately rated parachute rigger in accordance with the parachute manufacturer's instructions and without further authorization by the manufacturer or the FAA. Specifically, when various parachute components are interchanged, the parachute rigger should follow the canopy manufacturer's instructions as well as the parachute container manufacturer's instructions. However, the container manufacturer's instructions take precedence when there is a conflict between the two.

降落伞主要部件的组装。持证的、有合适评级的降落伞装备师，可以按照制造商的说明，装配不同制造商所生产的获得批准认证的降落伞部件，而无需制造商或联邦航空局的进一步授权。具体地说，互换降落伞部件时，降落伞装备师应遵循降落伞伞布制造商以及降落伞伞包制造商的说明。但是，如果两者之间存在冲突，则以伞包制造商的说明为准。

(1) Assembled parachute components must be compatible. Each component of the resulting assembly must function properly and may not interfere with the operation of the other components. For example:

进行组装的降落伞部件必须互相兼容。装配好后，每个降落伞部件都必须能够正常工作，并且不得干扰其他部件的工作。例如：

(a) Do not install a canopy of lesser or greater pack volume than the intended design criteria for the specific size of container, since it could adversely affect the proper functioning of the entire parachute assembly.

不得安装体积小于或大于特定伞包尺寸的预期设计标准的降落伞伞布，因为这可能对整个降落伞的正常工作产生不利影响。

(b) A TSO'd canopy may be assembled with a demilitarized harness, or vice versa, as long as the assembled components comply with the safety standard of the original design.

只要装配的部件符合原设计的安全标准，技术安全规定（TSO）认证的降落伞可以装配去军事化的背带，反之亦然。

(c) In cases where a main canopy that is already mounted on risers is assembled to an existing harness/container system, ensure that the completed assembly functions correctly. Refer to the manufacturer's instructions to see if and how the RSL (if installed) may be deactivated when equipment

configuration does not permit its use.
如果已装上组提带的主伞被装配到现有的背带系统上，请确保装配好的降落伞工作正常。当装备的配置要求不允许使用 RSL 时，请参阅制造商的说明，了解是否停用以及如何停用 RSL（如果已安装）。

(2) Any questions about the operation of the assembly should be resolved by actual tests by the rigger to make certain the parachute is safe for emergency use.
如果对组装好的降落伞是否能正常运行存在任何疑问，则应由降落伞装备师通过实际测试来确认，以确保降落伞在紧急情况下能够安全使用。

(3) For a single-harness parachute system, the strength of the harness must always be equal to or greater than the maximum force generated by the canopy during certification tests. The rigger who assembles the system should record these limits in a place accessible to the user when he or she dons the assembly. Some manufacturers may also specify minimum weights or speeds for safe operation.
对于单背带降落伞系统，背带的强度必须始终等于或大于认证测试期间由降落伞产生的最大力。负责装配的降落伞装备师在装配时应将这些受力限制记录在使用者可看到的地方。一些制造商也可能会同时规定降落伞安全运行的最小重量或速度。

(a) The maximum operating weight and maximum pack opening speed of components manufactured under TSO-C23c, TSO-C23d, and TSO-C23f are marked on the components themselves.
根据这些技术标准规定（TSO-C23c、TSO-C23d 和 TSO-C23f）制造的降落伞部件的最大工作重量和最大开伞速度应标记在部件上面。

(b) In the case where either the harness or canopy of a single-harness system is certified under TSO-C23b and the manufacturer has not specified operating limits, derive the maximum pack opening speed for that component from the strength test table in the National Aerospace Standards Specification (NAS)-804, Parachutes.
根据技术标准规定 TSO-C23b 认证的单背带降落伞系统的背带或降落伞，如果制造商没有明确规定工作限制，则可根据国家航空航天标准规范（NAS）804—“降落伞”中的强度试验表推导出该部件的最大开伞速度限制。

1. For the maximum operating weight of the TSO- C23b component, use the highest weight in the table less than or equal to the maximum operating weight of the other component and use the corresponding speed in the table as the maximum pack opening speed of the TSO-C23b component.
对于技术标准规定 TSO-C23b 认证的部件的最大工作重量，可使用表格中小于或等于其他部件最大工作重量的最大重量，并使用表格中相应的速度作为该 TSO-C23b 认证部件的最大开伞速度。
2. For the maximum pack opening speed of the TSO-C23b component, use the highest speed in the table less than or equal to the maximum pack opening speed of the other component and use the corresponding weight in the table as the maximum operating weight of the TSO-C23b component.
对于 TSO-C23b 认证部件的最大开伞速度，可使用表格中小于或等于其他部件最大开伞速度的最高速度，并使用表格中相应的重量作为该 TSO-C23b 组件的最大工作重量。

(4) For tandem systems, there may be additional limits for each harness.
对于双人伞系统，背带可能有附加的限制。

d. AAD Installation. The FAA accepts the installation (addition of pockets, channels, guides, etc., required for the AAD assemblage in the parachute container) of each make/model AAD as part of the paperwork that is submitted by the parachute manufacturer during the TSO approval for parachute harness/container systems. The TSO approval by the FAA and the AAD approval by the manufacturer (mentioned, for example, in § 105.43(b)) are for the installation only, and are based on AAD operation not interfering with normal function of the parachute. A retrofit installation, or installation of a make or model AAD other than those specifically authorized for use by the parachute manufacturer for a particular TSO or Military Specifications (MIL-SPEC)- approved parachute, constitutes an alteration to that parachute (see paragraph 16). Manufacturer and retrofit installation are done in consultation and agreement with the AAD manufacturer, and in accordance with established test procedures such as PIA Technical Standard (TS)-112, Harness/ Container - AAD Installation Test Protocol.

AAD 的安装。联邦航空局认可各品牌/型号的 AAD 的安装操作（在伞包中加上 AAD 按照所需的收纳袋、通道、导路等）作为降落伞制造商在降落伞背带/伞包系统接受技术标准规定（TSO）认证期间所提交的文件的部分内容。联邦航空局的 TSO 认证和制造商的 AAD 认证（例如 § 105.43（b）中所提到的）仅针对 AAD 的安装，其基础是 AAD 的运行不干扰降落伞的正常功能。安装翻新 AAD 装置，或者将未被降落伞制造商授权用于特定 TSO 认证或军方规格认证的降落伞的 AAD 安装在这些降落伞上的行为，被视为是对降落伞的改装（见第 16 款的内容）。制造和翻新安装是在与 AAD 制造商协商并达成一致的情况下完成的，且需符合既定的测试程序，如降落伞工业协会（PIA）技术标准（TS）-112—“背带和伞包 - AAD 安装测试规程”。

e. Instructions for Maintenance, Repair, or Alteration of Specific Parachutes. These instructions may be available by contacting manufacturers. Many manufacturers provide their manuals online through their websites. The PIA website, http://www.pia.com, provides a good starting point for searches. When such instructions are not available, The Parachute Manual, Volumes I and II (Dan Poynter, 1991) and FAA-H-8083-17, Parachute Rigger Handbook, set out commonly accepted repair practices. The Parachute Manual and The Parachute Rigger Handbook can be purchased from commercial booksellers; The Parachute Rigger Handbook is also available for download at: faa.gov/regulations_policies/handbooks_manuals/aviation/.

特定降落伞的维护、维修或改装说明。这些信息通过联系制造商获得。许多制造商通过其网站提供用户手册。也可以从降落伞工业协会（PIA）网站 http://www.pia.com 上开始搜索。如果没有此类用户手册，则“降落伞手册”的第一卷和第二卷（Dan Poynter 著，1991 年）和 FAA-H-8083-17—“降落伞装备师手册”列出了被普遍认可的维修规范。“降落伞手册”和“降落伞装备师手册”可从书店购买；降落伞装备师手册也可从以下网址下载：faa.gov/regulations_policies/handbooks_manuals/aviation/

f. Parachutist's Handling of Equipment. The user of a parachute system may perform simple assembly and disassembly operations necessary for transportation, handling, or storage between periods of use if the parachute's design simplifies such assembly and disassembly without the use of complex operations.

跳伞者对装备的处理。降落伞系统的使用者可以在不使用降落伞的时候，为了进行必要的运输、搬运或存放，而对其进行简单的组装和拆卸，前提是降落伞的设计简化了此类组装和拆卸的程序，而无需进行复杂的操作。

g. Removal of Pilot Chute. A certificated senior or master parachute rigger may remove the pilot chute from a front-mounted (e.g., chest-type) reserve parachute if the canopy does not use a diaper, bag, or other deployment device. When complete, the parachute must have the plain marking, "PILOT CHUTE REMOVED." This kind of parachute can be used for intentional jumping only.

引导伞的拆除。如果降落伞不使用棱布（Diaper）、D 包或其他开伞装置，则持证的资深或高级降落伞装备师可从前装式（如胸前式降落伞）的备用降落伞上卸下引导伞。操作完成后，降落伞上必须有“引导伞已卸下”的明显标识。这种降落伞只能用于有意进行的跳伞。

h. Extra Equipment. The FAA does not consider the attachment of an instrument panel, knife sheath, or other material to the exterior of the parachute assembly an alteration. If attaching any extra equipment, take care not to impair the functional design of the system.

额外的装备。将仪表板、伞刀套或其他材料装到降落伞系统外部的操作不被联邦航空局视为改装。如果需要附加装上任何额外的装备，请注意不要影响系统的功能设计。

14. PARACHUTE PACKING「叠伞」

a. Reserve Parachutes.「备伞」

(1) A certificated and appropriately rated parachute rigger must pack the reserve parachute.
必须由持证的且有适当评级的降落伞装备师来叠备伞。

(2) Visiting foreign parachutists jumping parachute systems that the FAA has not approved must have their reserve parachutes packed by someone acceptable to the foreign parachutist's Civil Aviation Authority (CAA) or by a FAA-certificated rigger.
外国跳伞者使用的未经联邦航空局批准的降落伞系统，必须由跳伞者所在国民航局认可的人员或联邦航空局认证的降落伞装备师来叠备伞。

(3) The certificated and appropriately rated parachute rigger must pack the reserve parachute within 180 days

before the date of use if the parachute system is made of materials substantially resistant to mold, mildew, or other rotting agents, or within 60 days of the date of use otherwise.

如果降落伞系统是由抗霉菌或其他抗腐蚀材料制成的，则须由持证且获得适当评级的降落伞装备师在使用日期前 180 天内叠备伞，如果不是，则须在使用日期前 60 天内叠备伞。

(4) A parachute user must ensure that an AAD is maintained in accordance with the AAD manufacturer's instructions and service requirements. When a rigger packs a reserve parachute, the rigger is only certifying that it meets all safety requirements on the day it is packed; therefore, riggers should note any maintenance or battery replacement due date(s) on the packing data card so that users are able to determine AAD airworthiness and ensure conformance to the regulations. AADs are to be installed in accordance with the harness/container manufacturer's instructions.

降落伞的使用者必须确保 AAD 是按照制造商的说明和服务要求进行维护的。降落伞装备师叠备伞时，只证明其在叠备伞当天符合安全要求；因此，降落伞装备师应在备伞卡上注明下次维护日期或下次电池更换日期，以便使用者确认 AAD 的适航性并确保符合规定。AAD 应按照背带和伞包制造商的说明进行安装。

(5) Only the rigger who did the packing, and whose seal is removed to permit scheduled or unscheduled maintenance or repairs to the reserve container, may open, reclose, and reseal it (e.g., AAD service or closing loop adjustment) within the 180-day or 60-day period in subparagraph 14a(3).

只有上次叠备伞的、其铅封被移除以能对备伞伞包进行计划内或计划外维护或维修的降落伞装备师，才可在 14a（3）中提到的 180 天或 60 天期限内打开备伞伞包、并对其重新关包和重新密封（例如，因 AAD 到期维护或对备伞关包绳进行调整）。

b. Main Parachutes. Main parachutes must be packed within 180 days before the date of use and be packed by any certificated parachute rigger or a person working under the direct supervision of a certificated parachute rigger. The person making the next jump (including a tandem parachutist in command, but not the passenger parachutist) may also pack the main parachute.

主伞。主伞必须在使用日期前 180 天内进行叠伞。任何持证降落伞装备师，或在持证降落伞装备师直接监督下的人员都可以叠主伞。用这个主伞进行下一次跳伞的人（包括双人伞指挥员，但不含双人伞乘员）也可以叠主伞。

15. PARACHUTE REPAIRS「降落伞的维修」

a. Major Repair. A major repair, as defined in § 1.1, is a repair that, if improperly done, might appreciably affect airworthiness.

大修。14 CFR 1.1 节中定义的大修是指如果操作不当，可能明显影响适航性的维修。

b. Minor Repair. A minor repair is a repair other than a major repair.

小修。小修是大修以外的维修。

c. Major or Minor Repair Determination. When there is a question about whether a particular repair is major or minor, follow the manufacturer's instructions. In the absence of the manufacturer's instructions, riggers should use the FAA's Parachute Rigger Handbook (FAA-H-8083-17) and Poynter's Parachute Manual Volume I and II as guides. If the procedure calls for a master rigger, it should be considered a major repair. If the procedure allows for a senior rigger, it should be considered a minor repair.

如何确定某项维修是大修还是小修。当对某项维修是大修还是小修有疑问时，请遵循制造商的说明。在没有制造商说明的情况下，降落伞装备师应使用联邦航空局的“降落伞装备师手册”（FAA-H-8083-17）和“降落伞手册”（Poynter 著）的第一卷和第二卷作为指南。如果维修流程需要高级降落伞装备师参与，则应视为大修。如果维修流程仅需资深降落伞装备师参与，则应视为小修。

(1) The same kind of repair may be classed as major or minor depending on size or proximity to key structural components. For example, a basic patch may be a minor repair if it is small and away from seams, but may be a major repair if it is large or adjacent to a seam.

即使是同一类型的维修，根据维修部件的尺寸或者其距离关键结构部件的距离，也可分为大修或小修。例如，打一个很小且远离缝线的补丁，可被视为小修；如果补丁很大或靠近缝线，则应被视为大修。

(2) The same kind of repair may be classed as major or minor depending on whether it is done to an approved or unapproved component. For example, replacement of a suspension line on a reserve canopy is usually a major repair, while replacement of a suspension line on a main canopy is generally considered a minor repair (even if the identical technique is required for both replacements).
同一类型的维修，根据它是对已或批准认证的部件进行的还是对未获批准认证的部件进行的，也可分为大修和小修。例如，更换备伞的伞绳悬挂线通常被视为是大修，而更换主伞的伞绳悬挂线则通常被视为小修（即使这两个更换操作所需的技术是相同的）。

(3) If an operation results in an approved configuration, the operation is considered a repair. For example, if a parachute system is approved with and without an RSL, then removing or replacing RSL components is a repair that may be major or minor depending on whether, if improperly done, it might appreciably affect airworthiness. Similarly, resizing a harness, when the original design permits a range of sizes, is a repair when the resized harness remains within the permitted range.
如果对降落伞进行的某个操作的结果是某种已获得批准的降落伞配置状态，那么这个操作就被视为维修。例如，如果一个降落伞系统被批准既可以使用 RSL，也可以不使用 RSL，那么拆除或替换它的 RSL 就是一次维修。这个维修可能是大修，也可能是小修，取决于这个维修如果操作不当时，是否会对适航性产生明显的影响。类似地，当一个背带的原始设计允许一定的尺寸范围调整时，在允许范围内调整背带尺寸的操作会被视为是一次维修。

(4) Only an appropriately rated master rigger or a manufacturer of approved parachute components may make major repairs. The manufacturer may designate certain repairs to be done only by the manufacturer or the manufacturer's designee.
只有获得适当评级的高级降落伞装备师或经批准的降落伞部件制造商才能进行大修。制造商可指定某些特定的维修只能由制造商本身或制造商指定人员进行。

16. PARACHUTE ALTERATIONS「降落伞的改装」

a. Configuration. Alterations are changes to a parachute system configuration that the manufacturer or the manufacturer's supervising FAA Aircraft Certification Office (ACO) has not approved. Examples include removing a deployment device from a reserve canopy, adding harness fittings to permit attaching an additional canopy, using nonstandard repair materials or techniques, or installation of a specific make/model AAD when the manufacturer has not authorized such changes. Changes that result in an approved configuration are considered repairs (see paragraph 15).
降落伞的配置。改装指的是未获得降落伞制造商或者联邦航空局飞行器认证办公室（ACO）批准的、对降落伞系统的配置更改。例如：从备伞上拆下开伞装置、添置背带配件以安装额外的一个降落伞、使用非标准的维修材料或技术、安装特定品牌/型号的 AAD 且制造商未授权使用此种 AAD。在批准范围内改变降落伞的配置的操作被视为维修而不是改装（见第 15 款内容）。

b. Approval. An alteration to an approved parachute system must be done in accordance with approved manuals and specifications and only by those with specific authorization to perform that alteration. Specific approval is not needed for the method of altering a non-TSO'd main parachute canopy. A person seeking authorization to alter an approved parachute system should proceed as follows:
批准。对获批准认证的降落伞系统的改装必须遵照经批准的手册和规范进行，并且只能由经特定授权的人员进行改装。对非 TSO 认证的主伞的改装方法无需申请特定批准。希望申请授权以对经批准认证的降落伞系统进行改装的人员，应遵照以下步骤进行：

(1) A person qualified to alter a parachute (as listed below) should contact his or her local FAA FSDO inspector to discuss the proposed alteration. The applicant should be prepared to show the inspector the nature of the alteration by using a sample assembly, sketch, or drawing and be prepared to discuss the nature of the tests necessary for showing that the altered parachute meets all applicable requirements.
有资格改装降落伞的人员（如后文所列）应联系其当地的联邦航空局飞行标准办公室安全检查员，以讨论拟进行的改装。申请人应准备好向检查员展示改装样品、草图或图纸，以阐明改装的性质，并准备讨论必要的

试验及其性质，以证明改装后的降落伞符合其适用的所有要求。

(2) The inspector will review the proposal with the applicant and a plan of action will be agreed upon.
检查员将与申请人一起审查提案，并确定操作计划。

(3) The applicant will then prepare an application, in the format of a letter, addressed to the local FSDO. Attach all pertinent data. The data should include:
然后，申请人将以信函的形式准备一份写给当地飞行标准办公室的申请。附上所有相关数据。数据应包括：

- A clear description of the alteration;
  对改装的清楚描述；
- Drawings, sketches, or photographs, if necessary;
  图纸、草图或照片（如有需要）；
- Information such as thread size, stitch, pattern, materials used, and location of altered components; and
  相关信息，例如：绳线粗细大小，缝纫方法，样式，使用的材料，改装部件的位置；以及
- Some means of identifying the altered parachute (model and serial number).
  识别被改装的降落伞的方法（型号和序列号）。

(4) The FSDO aviation safety inspector (ASI) may send an alteration to the ACO for review if the ASI is not experienced in parachute alterations. When satisfied, the inspector will indicate approval by date stamping, signing, and placing the FSDO identification stamp on the letter of application.
当地飞行标准办公室安全检查员如果没有降落伞改装的经验，可以将改装发送给飞行器认证办公室（ACO）进行审查。如果通过审查，检查员将在申请书上加盖日期戳、签名并加盖飞行标准办公室公章，以表示批准。

(5) Only a certificated and appropriately rated master parachute rigger, a current manufacturer of approved parachute systems or components, or any other manufacturer the Administrator considers competent may perform alterations to approved parachutes.
只有持证的且获得适当评级的高级降落伞装备师、持有有效期内批准认证的降落伞系统或部件制造商，或者管理局认为有能力的任何其他制造商，才能对获批准认证的降落伞进行改装。

17. MATERIALS USED FOR REPAIRS TO TSO-APPROVED COMPONENTS「维修 TSO 认证部件所用的材料」

a. Material Quality. Materials used for repairs to TSO-approved components including, but not limited to, fabric, suspension line, tape, webbing, thread, and hardware, must meet the same specifications, requirements, and certifications of the original materials used by the manufacturer.
材料质量。用于维修 TSO 认证部件的材料，包括但不限于布料、伞绳悬挂线、条带、织带、线和金属部件，必须符合制造商所用原始材料的同等规格、要求和认证。

b. Parachute Fittings. Hardware may be reconditioned and reused, as long as it complies with subparagraph 17a. However, the plating or replating of load-carrying parachute fittings may cause hydrogen embrittlement and subsequent failure under stress unless the plating is done properly. Chrome- or nickel-plated harness adjustment hardware may also have a smoother finish than the original and may permit slippage.
降落伞配件。只要符合 17a 的规定，金属部件可进行重新整修和再使用。但是，除非电镀处理得当，否则对承载负荷应力的降落伞配件进行电镀或再电镀可能导致氢脆，并使其在应力下引发材料失效。镀铬或镀镍的用于背带调整的金属部件的表面也可能比原始部件更光滑，可能导致打滑。

John Barbagallo Director, Flight Standards Service
飞行标准服务部主任 John Barbagallo

APPENDIX 1 TABLE OF LOCATION OF JUMP AUTHORIZATION OR NOTIFICATION
「附录 1 跳伞地点的授权或通知」

Location of Jump **跳伞位置**	**Kind of Authorization Required** **所需的授权类型**	**When to Apply or Notify** **何时进行申请或通知**	**Where to Apply or Notify** **在哪里进行申请或通知**	**Title 14 CFR Section Reference 14 CFR** **参考部分**
Over or onto any airport 在任何机场上空，或跳入机场内	Prior approval 事先批准	Prior to jump 跳伞前	Airport management 机场管理者	§105.23
In or into Class E or G airspace 在 E 或 G 类空域内， 或进入这些空域	Air Traffic Control (ATC) notification 空中交通管制通知	Between 24 hours and 1 hour prior to jump 跳伞前 24 小时 至 1 小时	ATC facility having jurisdiction 有管辖权的 空中交通管制部门	§105.25
In or into Class A, B, C, or D airspace 在 A、B、C、D 类空域内， 或进入这些空域	ATC authorization (see Note) 空中交通管制授权（见注）	Prior to jump 跳伞前	ATC facility having jurisdiction 有管辖权的 空中交通管制部门	§105.25
Over or within a restricted or prohibited area 在限制区域或禁区之上或之内	Prior authorization 事先授权	Prior to jump 跳伞前	Controlling agency, as noted on sectional chart 管理机构， 参见区域航图的标示	§105.25
Over or into a congested area or open air assembly of persons 越过或进入拥挤区域或露天人员集会	FAA Form 7711-1, Certificate of Authorization 联邦航空局 7711-1 表格 授权证书	10 working days prior to jump 跳伞前 10 个工作日	Flight Standards District Office (FSDO) having jurisdiction over the area where jump is to be made 对跳伞区域具有管辖权的当地飞行标准办公室 （FSDO）	§105.21
Note: Verbal authorization normally issued. 注：一般为口头授权				

APPENDIX 2. OPERATION OF AIRCRAFT WITH DOOR REMOVED OR MODIFIED FOR PARACHUTING OPERATIONS「附录 2 因跳伞作业而拆卸或改装了舱门的飞行器的操作」

1. OPERATING LIMITATIONS REVISION.「操作限制的修订」

The previous revision, Advisory Circular (AC) 105-2D, Sport Parachuting, Appendix 2, provided a list of aircraft that have Federal Aviation Administration (FAA)-approved door open or removal procedure authorization with operating limitations. That list did not include all the aircraft currently used in skydiving operations. Instead of continuing with the use of that list, contact your local Flight Standards District Office (FSDO) for information on getting an authorization to operate your aircraft with the door removed and/or a door modified to open/close in flight. Aircraft that have approved procedure and operating limitations in their FAA-approved Aircraft Flight Manual (AFM) or a FAA-approved Supplemental Type Certificate (STC) may operate in accordance with those documents.

先前的修订版—咨询通告 AC 105-2D—“降落伞运动”的附录 2，提供了一份经联邦航空局批准的飞行器名单，这些飞行器可被授权在一定的操作限制下对舱门进行打开或拆除。这份名单并没有囊括目前用于跳伞作业的所有飞行器。可以联系您当地的飞行标准办公室，而不必参考这份名单，以获得授权，从而能够在舱门被拆除和/或舱门被改

装为可打开/关闭的情况下操作飞行器飞行。如果一款飞行器的被联邦航空局批准的“飞行器飞行手册”（AFM）或者“补充型号证书”（STC）中有获批的相关程序和操作限制，则这款飞行器可以按照这些文件中的规定进行操作。

2. OPERATION WITH MODIFIED OR REMOVED DOOR. 「舱门改装或移除后的飞行器操作」

Any aircraft type, utility/normal category model that has had FAA-approved data used for skydiving operations or door removal can be considered.

任何型号或应用分类/常规分类下的飞行器，如果有联邦航空局认证的跳伞作业飞行数据或者舱门移除后的飞行数据，都可被考虑用于相关操作。

a. Required Data. It is the responsibility of the applicant to supply the FAA aviation safety inspector (ASI) with any data necessary to have his or her aircraft approved to operate with a door removed or a door modified to open/close in flight during jump operations. If the aircraft is altered and operated in accordance with an STC, no other limitations are required.

必要数据。申请者有责任向联邦航空局安全检查员（ASI）提供任何必要的数据，以使其飞行器获得许可，可在舱门被拆除或改装后，在跳伞作业期间，在舱门打开/关闭的情况下飞行。如果飞行器的改装和操作遵循了补充型号证书的规定，则无其他限制。

b. Approved Data. Many aircraft have jump door and/or restraint systems approved by type certificate (TC), STC, or field approval. Aircraft that have not been FAA-approved by TC, STC, or field approval must have the required data to address the alteration from a Designated Engineering Representative (DER), Organization Designation Authority (ODA), or other FAA-approved data. This data will allow the owner/ operator the ability to apply for a field approval or one-time STC for that aircraft.

批准认证的数据。许多飞行器都有型号证书（TC）、补充型号证书批准的跳伞舱门和/或安全带系统，或现场批准的跳伞舱门和/或安全带系统。未经联邦航空局型号证书、补充型号证书批准的，或未经现场批准的飞行器，须有必要数据，以用于处理指定工程代表（DER）、组织指定机构（ODA）或其他联邦航空局批准的数据的变更。飞行器所有者/经营者可凭借这些数据申请该飞行器的现场批准或一次性补充型号证书。

3. PREVIOUSLY APPROVED FIELD APPROVALS.「以前获得的现场批准」

Applicants can present a previously FAA-approved field approval for jump door, handles, step, and skydiver restraint systems as data for the field approval process if the FAA-approved data are for the same aircraft make, model, and series (M/M/S).

如果联邦航空局批准认证过同一品牌、型号、系列（M/M/S）的飞行器的数据，则申请者可以提交以前获得的对跳伞舱门、把手、步梯、跳伞者安全带的现场批准，以用于本次现场批准流程。

4. FIELD APPROVAL PROCESS.「现场批准流程」

Applicants need to follow the latest guidance found in FAA Order 8900.1, Flight Standards Information Management System (FSIMS), Volume 4, Chapter 9, Selected Field Approvals, for a field approval process. This guidance can be found at http://fsims.faa.gov. Any changes to the flight manual require FAA and Aircraft Certification Office (ACO) approval. Applicants must include placards and skydiver restraint systems in the continued airworthiness instructions covering the repair of placards, restraint system components, steps, handles, jump doors, etc. Installation, removal, and inspection of installed equipment will be entered in the aircraft maintenance records, including the inspection checklist for the installation and operational check of restraint systems.

申请者需遵循联邦航空局 8900.1 号令—飞行标准信息管理系统（FSIMS）第 4 卷第 9 章“所选的现场批准”的最新指导，以进行现场批准流程。这份文件可以在 http://fsims.faa.gov 上找到。飞行手册的任何更改都需要得到联邦航空局和飞行器认证办公室（ACO）的批准。申请者必须在持续适航指引中纳入相关标识和跳伞者安全带系统，内容包括标识的维修、安全带系统组件、步梯、把手、跳伞舱门等。已安装设备的安装、拆除和检查将被记录在飞行器维护记录中，记录内容包括安装检查清单，以及安全带的操作检查。

APPENDIX 3. SEATS AND RESTRAINT SYSTEMS「附录 3 座椅和安全带系统」

1. SEATING CONFIGURATION AND RESTRAINT SYSTEM SAFETY.「座椅配置和安全带系统的安全性」

Not all seating and restraint system configurations used in jump aircraft provide the same level of safety in the event of an emergency landing. This appendix provides general information concerning the relative safety of commonly used seating configurations and restraint systems. These safety assessments are based on available research data and in-service experience.

并非所有用于跳伞作业的飞行器的座椅和安全带系统的配置在紧急着陆时都能提供相同的安全保护级别。本附录介绍了关于常见座椅配置和安全带系统的安全性的对比的一般信息。这些安全评估是以现有的研究数据和服务经验为基础的。

2. GENERAL INFORMATION「一般信息」

a. Quick Release Track Fittings. Single stud quick release track fittings have been shown to release from the track at dynamic loads much lower than their rated strength. Dual stud quick release fittings did not exhibit this behavior in dynamic tests. Therefore, dual stud quick release fittings of the type shown in Figure 2, Dual Stud Quick Release Track Fitting, provide a much more reliable restraint anchorage than single stud fittings.

快速释放轨道配件。测试显示单钉快速释放轨道配件可能会在动态载荷远低于其额定强度的情况下从轨道上释放。双钉快速释放轨道配件则在动态试验中没有表现出这一特性。因此，图 2 所示类型的双钉快速释放轨道配件可提供比单钉快速释放轨道配件更可靠的约束。

b. Lap Belts. Lap belts are only effective if there is a solid support surface behind the occupant, such as a seat back, aircraft sidewall, or bulk-head. Otherwise, a tether restraint that attaches to the parachute harness provides more effective restraint.

安全腰带。只有当乘客背后有坚实支撑面，如座椅靠背、飞行器侧壁或隔板时，安全腰带才是有效的。否则，系在降落伞背带上的系绳安全带将提供更有效的约束。

c. Restraint for Aft-Facing Parachutists. Research has shown that to restrain aft-facing parachutists, the most effective point to attach a tether restraint to a parachute harness is at the junction of the leg straps, main lift web, and the horizontal back strap. Figure 3, Tether Restraint Usage, illustrates this attachment method, in which the tether loop encircles the junction by passing between the main lift web and the horizontal back strap, and between the upper leg strap and the lower leg strap. One way to achieve this is to route the tether loop under the upper leg strap, then under the main lift web before latching the loop, as depicted in Figure 4, Pass Tether Loop Under Upper Leg Strap, Figure 5, Pass Tether Loop Under Main Lift Web, and Figure 6, Latch Tether Loop Around Parachute Harness. Since these two components of the harness are easily accessible by the wearer, this attachment method should not be prone to misuse. It also provides more effective restraint than attaching at other points on the parachute harness since the restraining force is applied near the seated occupant's center of gravity (CG).

面朝机尾就坐的跳伞者的安全带装置。研究表明，为了给面朝机尾就坐的跳伞者提供良好的约束，系绳式安全带系的最有效的使用方法是将其系在降落伞背带的腿带、主支撑带、水平背部带三者的连接处，如图 3 所示。其中，系绳在主支撑带和水平背部带之间、上腿带和下腿带之间穿过，以环绕腿带、主支撑带、水平背部带三者的连接处。实现这种系法的一个方法是，在扣上安全带之前，先将系绳从上腿带的下方穿入，然后经过主支撑带，从主支撑带下方穿出，如图 4、图 5、图 6 所示。由于安全带的佩戴者可以很容易地够到背带的这两个部分，因此这种系法不易被误用。这种系法还比系在降落伞背带上的其他位置更好，因为安全带的约束力是施加在佩戴者的重心附近的。

d. Restraint Belts or Tethers. Past experience and testing have shown the validity of attaching a restraint belt(s) or tether(s) to the parachute harness as part of the overall integrated restraint system. However, most manufactures have not tested their parachute harness configurations to see if they can accept the load vectors that would be experienced during the actual use of this type of restraint configuration. Because of this, any parachute harness that has been subjected to actual use as part of an integrated restraint system must be removed from service and inspected by the manufacturer or a parachute rigger designated by the manufacturer to determine the continued airworthiness of the parachute harness. If the inspection shows that the harness is Airworthy, it may be returned to service.

约束带或系绳。过往经验和测试表明，作为整个综合安全带系统的一部分，将约束带或系绳系在降落伞背带上是有效的。然而，大多数降落伞背带制造商并未测试他们的降落伞背带是否能承受这种类型的安全带在实际起作用时所承受的载荷。因此，作为综合安全带系统的一部分，任何在实际使用中承受了冲击的降落伞背带必须停止使用，并由制造商或制造商指定的降落伞装备师进行检查，以确定降落伞背带的持续适航性。如果检查结果表明降落伞背带满足适航要求，则可以恢复使用。

3. SPECIFIC SEATING/RESTRAINT CONFIGURATIONS「特定座椅/安全带配置」

a. Side-Facing. Conventional side-facing bench seats employing dual point lap belts are a superior means of carrying parachutists in aircraft large enough to accommodate them. They offer the advantages of being simple to use and can be designed to provide significant vertical energy absorption.

侧向座椅。传统的侧向长凳座椅，搭配上双点固定的安全带，是足够容纳这些设备的飞行器上搭载跳伞者的推荐方式，其具有使用简单的优点，并且可以设计成能够显著吸收垂直冲击能量的形式。

b. Rear-Facing Floor Seating.「面朝机尾的机舱地板座椅」

(1) Restraints are more effective if attached to the floor instead of the sidewall. Only use sidewall attachments if floor attach points are not available.

对于这种座椅，使用连接到机舱地板的安全带比使用连接到机舱侧壁的安全带更有效。应该仅在没有地板连接点的情况下使用侧壁连接方式。

(2) Effectiveness is increased if overall tether length is kept as short as possible and the tether attachment to the aircraft is aft of the harness attachment point.

系绳总长度越短，且系绳与飞行器的连接点在其与降落伞背带连接点的后方时，使用效果会越好。

(3) Single point, single tether restraints are not recommended.

不建议使用单点固定的单系绳安全带。

(4) Dual point, dual tether restraints offer superior restraint compared to single point, single tether restraints. This restraint method consists of two straps, each connecting the parachute harness to the aircraft floor on both sides of the parachutist as shown in Figures 7, Tether Restraint Attachment To Floor For Rear-Facing Floor Seats, Figure 8, Dual Point, Dual Tether Restraint Configuration For Rear-Facing Floor Seats, and Figure 9, Dual Point, Dual Tether Restraint Attachment To Floor For Rear-Facing Straddle.

与单点固定的单系绳安全带系统相比，双点固定的双系绳安全带系统有更好的约束效果。这种约束方式由两条系绳组成，两条系绳将降落伞背带连接至跳伞者两侧的飞行器地板，如图 7、图 8、图 9 所示。

c. Rear-Facing on Straddle Bench.「面朝机尾的跨坐式座椅」

(1) Straddle benches can offer more occupant crash protection than floor seating since they can be designed to provide significant vertical energy absorption.

跨座式座椅比起地板座椅可以更好地在碰撞中保护乘客，因其可以设计成能够显著吸收垂直冲击能量的形式。

(2) As with floor seating, restraints are more effective if attached to the floor instead of the sidewall.

与地板座椅一样，安全带固定在地板上会比固定在侧壁上更有效。

(3) Restraint effectiveness is improved if the tether strap is attached to the floor such that it is at an approximately 45 degree angle, as shown in Figure 9.

系绳固定在地板上且处于大约 45 度倾斜角时，保护效果会更好，如图 9 所示。

(4) Single point, single tether restraints are not very effective.

单点固定的单系绳安全带的约束效果不佳。

(5) Dual point, dual tether restraints offer superior restraint compared to single point, single tether restraints.

与单点固定的单系绳安全带系统相比，双点固定的双系绳安全带系统有更好的约束效果。

图2 双钉快速释放轨道配件

Figure 2. Dual Stud Quick Release Track Fitting

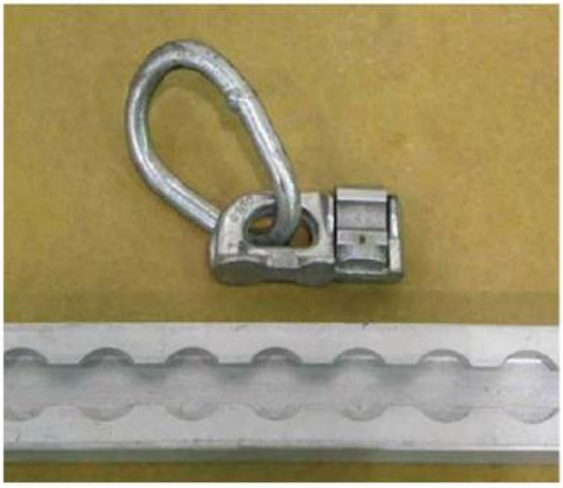


图3 系绳式安全带的用法

Figure 3. Tether Restraint Usage

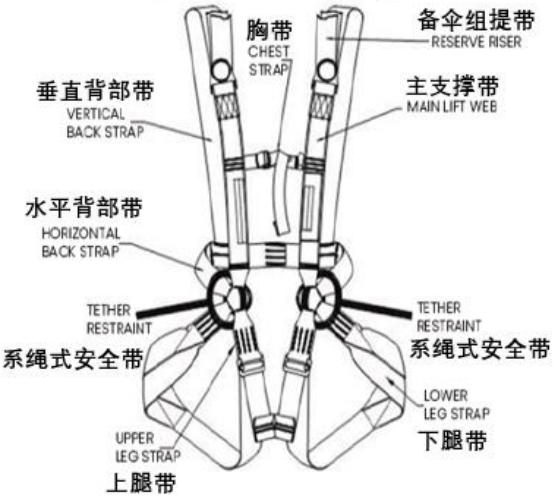


图4 系绳穿过上腿带

Figure 4. Pass Tether Loop Under Upper Leg Strap

图5 系绳穿过主支撑带

Figure 5. Pass Tether Loop Under Main Lift Web

图6 将系绳式安全带扣在降落伞背带上

Figure 6. Latch Tetcher Loop Around Parachute Harness

图7 系绳与机舱地板的连接
（对于面朝机尾的机舱地板座椅）

Figure 7. Tether Restraint Attachment To Floor For Rear-Facing Floor Seats

图8 双点固定的双系绳安全带的配置
（对于面朝机尾的机舱地板座椅）
Figure 8. Dual Point, Dual Tether Restraint Configuration For Rear-Facing Floor Seats

图9 双点固定的双系绳安全带与机舱地板的连接
（对于面朝机尾的跨坐式座椅）
Figure 9. Dual Point, Dual Tether Restraint Attachment To Floor For Rear-Facing Straddle

9-3 联邦航空局空中交通公报 FAA Air Traffic Bulletins

Air Traffic Bulletins are published by FAA Headquarters quarterly or as needed to brief air traffic controllers on specific issues. These two bulletins addressed skydiving issues.
联邦航空局总部每季度或根据需要不定期发布空中交通公报，向空中交通管制员提供关于特定事项的简报。以下这两份公告讨论了跳伞事项。

Parachute Jumping「跳伞」
/*TEF/ Portions of this article have been used with the permission of the National Aeronautics and Space Administration, Ames Research Center, which has been involved in data collection of parachute jumping incidents through the Aviation Safety Reporting System. We gratefully acknowledge its efforts in increasing the aviation community's awareness of this subject.
本文的部分内容已获得美国国家航空航天局艾姆斯研究中心的许可，该中心通过航空安全报告系统参与了降落伞跳伞事故的数据收集工作。我们感谢它努力提高航空界对这一问题的认识。

As spring approaches and temperatures moderate we can count on the annual increase of parachute jumping activities. We would like to take this time to remind facilities and controllers of their responsibilities when it comes to parachute jumping operations.
随着春天的临近和气温变得温和，我们预期每年这时候跳伞活动都会增加。我们想借此机会提醒相关部门和空管员在跳伞作业中的责任。

Order 7110.65, Chapter 9, Parachute Jumping, details the specific responsibilities of controllers, and we encourage you to review this section. Experience has shown that most of the questions concerning a controller's responsibility for parachute jumping activities relate to Class E airspace. Coincidentally, most parachute jumping activity occurs in Class E airspace, and that is where we would like to address these operations.
第 7110.65 号令的第 9 章“跳伞”中，详细说明了空管员的具体职责，我们鼓励您回顾这一节。经验表明，管理人员对其在跳伞活动中的职责有关的问题大多与 E 类空域有关。巧合的是，大多数跳伞活动都发生在 E 类空域，而这些空域正是我们要谈的。

Class E airspace is that airspace which "flows" around and over Classes B, C, D, and G airspace and has a ceiling of 18,000 feet MSL. Because most jump activities take place in Class E airspace, the majority of problems occurring with these operations are taking place there. Several additional clarifications on Air Traffic Control responsibilities in Class E airspace are important.
E 类空域是指在 B、C、D 和 G 类空域周围和上空“流动”的空域，其最高高度为海拔 18000 英尺。由于大多数跳伞活动发生在 E 类空域，因此这些活动中出现的大多数问题都发生在那里。对 E 类空域的空中交通管制部门的责任进行若干补充说明是很重要的。

Controllers are not authorized to impose restrictions (for example, to deny or approve a jump) on parachute operations in Class E airspace, as they are authorized to do in Class A, B, C, or D airspace.
空管员无权对 E 类空域的降落伞作业施加限制（例如拒绝或批准跳伞），虽然他们在 A、B、C 或 D 类空域有权对降落伞作业进行授权。

Controllers are required to give traffic advisories to jump aircraft before the jump, and to issue advisories to all known aircraft that will transit the Class E airspace within which the jump operations will occur. When time or the number of aircraft make individual transmissions impractical, advisories to nonparticipating aircraft may be broadcast on appropriate frequencies.

空管员须在进行跳伞作业的飞行器开始跳伞作业前发出交通建议，并向所有经过 E 类空域的已知飞行器发出交通建议。当飞行器数量太多或时间太紧张，使得逐个通知不切实际时，可在适当频率上广播对未参加的飞行器进行通告。

The point of these clarifications is to emphasize the special need in Class E airspace jump operations for both pilots and controllers to plan ahead, communicate clearly, and utilize extra vigilance in areas where jump zones are close to airways or approach corridors.
这些详细说明的目的是强调在 E 类空域进行的跳伞作业中，飞行员和空管员都需要提前计划，清晰沟通，并在跳伞区域靠近航空航线或空中交通走廊时保持额外的警惕心。

—December 1995
—1995 年 12 月

Parachute Operations「降落伞作业」

/*TERF/ It has come to our attention that there may be some confusion among controllers regarding the regulations and procedures for the conduct of parachute operations. In 2001, title 14, Code of Federal Regulations (14 CFR), part 105, was amended and may be the cause of some of the confusion. Therefore, we would like to provide the following information and remind controllers of their responsibilities to aircraft conducting parachute operations.
/*TERF/我们注意到，空管员可能对进行降落伞作业的规章和程序有一些不清楚的地方。2001 年，联邦法规汇编第 14 卷（以下简称 14 CFR）第 105 部分被修订，这可能是造成某些混乱的原因。因此我们希望提供以下信息并提醒空管员他们对于降落伞作业飞行器的责任。

Regulations addressing parachute operations are contained in, 14 CFR, part 105. Additional procedures and guidance can be found in Federal Aviation Administration Order (FAAO) 7110.65, Air Traffic Control, chapter 9, and FAAO 7210.3, Facility Operation and Administration, chapter 18.
降落伞作业的有关规定载于 14 CFR 第 105 部分。其他程序和指南见：联邦航空局命令（以下简称 FAAO）7110.65 - 空中交通管制 - 第 9 章，以及 FAAO 7210.3 - 设施运行和管理 - 第 18 章。

1. Why is a letter of notification received by air traffic facilities on a yearly basis from local parachute operators?
为什么空中交通部门每年都会收到当地跳伞运营方的通知信？

In accordance with 14 CFR, section 105.25(a)(3), prior to conducting parachute operations within Class E or Class G airspace, persons must notify the air traffic control (ATC) facility having jurisdiction over the airspace at the first intended exit altitude. Notice may be provided via telephone and must be given no earlier than 24 hours before and no later than 1 hour before the parachute operation begins. However, 14 CFR, section 105.25(c), provides for air traffic facilities to accept written notification from skydiving centers and clubs on an ongoing basis, over a stated period of time, not to exceed 12 calendar months. Written notification of parachute jump operations is not required within Class E and Class G airspace areas. However, in areas where jumps take place on a regular basis, a letter that contains information about the parachute operations is helpful and is preferred over a phone call. Please note that this is not a change from the prior rule. However, more facilities have received letters recently as the United States Parachute Association has encouraged its members to write. Providing air traffic facilities with information regarding the drop zones, dates, times of jumps, aircraft registration number, and pilot names helps reduce phone calls and frequency congestion and contributes to the safety of aircraft operating when parachute operations are being conducted.

根据 14 CFR 第 105.25（a）（3）节，在 E 类或 G 类空域内进行降落伞作业前，相关人员必须通知对第一次预定离机高度的空域具有管辖权的空中交通管制（ATC）部门。通知可通过电话发出，且不得早于降落伞作业开始前 24 小时，也不得迟于降落伞作业开始前 1 小时。然而，14 CFR 的 105.25（c）规定，空中交通管制部门应在被明示的不超过 12 个日历月的时间范围内持续接收跳伞基地和俱乐部的书面通知。E 类和 G 类空域是不需要降落伞作业的书面通知的。然而，在经常跳伞的地方，写一封包含降落伞作业信息的函件是有帮助的，比电话通知更好。请注意，这相较先前的规则没有变化。然而，随着美国跳伞协会鼓励其会员写函，最近空管部门收到的函件越来越多。

向空管部门提供有关降落区、日期、跳伞次数、飞行器注册号和飞行员姓名的信息，有助于减少电话的使用和频率占用，并有助于在进行降落伞作业时确保飞行器的安全。

2. In Class A, B, C and D airspace areas, what authorization do parachute operators need and who issues the authorization?

在 A 类、B 类、C 类和 D 类空域，跳伞运营方需要什么样的授权，授权由谁签发？

In accordance with 14 CFR, section 105.25(a)(1) and (2), no person may conduct a parachute operation and no pilot in command of an aircraft may allow a parachute operation to be conducted from that aircraft unless an air traffic control authorization has been issued. The parachute operator must provide the information specified in 14 CFR, section 105.15(a), that includes drop zone location, times of jumps, aircraft registration number, name and address of pilot, and intended exit altitude. The ATC facility (terminal or en route center) having jurisdiction over the airspace containing the first intended exit altitude is responsible for issuing the authorization. In most cases, since parachute operations descend through numerous altitudes, as well as air traffic facility boundaries and sectors, it is incumbent on the ATC facility that issues the authorization to coordinate with other facilities that may be impacted by this operation.

根据 14 CFR 第 105.25（a）（1）和（2）的规定，除非已获得空中交通管制授权书，任何人不得进行降落伞作业，飞行器的飞行员也不得允许在该飞行器上进行降落伞作业。跳伞运营方必须提供 14 CFR 中 105.15（a）规定的信息，包括降落区位置、跳伞次数、飞行器注册号、飞行员姓名和地址以及预定的离机高度。对第一次预定离机高度的空域具有管辖权的空中交通管制部门（无论是机场空管部门还是航路空管部门）负责签发授权书。在大多数情况下，由于降落伞作业经过许多高度，也经过空中交通管制的边界和区域，负责管理的空中交通管制部门必须与可能受此作业影响的其他部门进行协调。

3. How has the role of flight service stations (FSS) changed since 14 CFR, part 105, was amended?

自 14 CFR 第 105 部分修订以来，飞行服务站（FSS）的角色发生了怎样的变化？

The FSS's vital role of providing weather briefings and issuing Notices to Airmen of parachute operations remains current. Prior to the automation of FSSs, most FSS facilities were located at airports and had an active role in providing airport advisories. Previously, 14 CFR, part 105, contained a provision that required parachute operators to contact the nearest ATC facility or FSS at least 5 minutes prior to the jump for the sole purpose of obtaining traffic advisories. Since most FSSs are no longer located at airports, the rule has been amended. 14 CFR, section 105.13(a)(1)(ii), now states that communications must be established between the jump aircraft and the ATC facility having jurisdiction over the affected airspace of the intended exit altitude. In other words, the pilot of the jump aircraft will be in communication with and receive traffic advisories from the ATC facility that is responsible for and has real-time information about other air traffic in the area.

飞行服务站向跳伞者提供天气预报和发布降落伞作业相关的航空人员通知（NOTAM）的重要作用仍然存在。在飞行服务站自动化之前，大多数飞行服务站都位于机场，并在提供机场咨询方面发挥了积极作用。此前，14 CFR 第 105 部分有一项规定，要求降落伞作业人员在跳伞前至少 5 分钟与最近的空中交通管制部门或 FSS 联系，以获取交通建议。由于大多数飞行服务站不再设在机场，该规则已被修订。14 CFR 的 105.13（a）（1）（ii）规定，降落伞作业飞行器和对预定离机高度所在空域具有管辖权的空中交通管制部门之间必须建立通信。换言之，降落伞作业飞行器的飞行员将与负责该地区的其他空中交通并拥有该地区其他空中交通实时信息的空中交通管制部门进行通信并接收交通建议。

4. When is a certificate of authorization required and who issues it?

何时需要授权书，授权书由谁签发？

In accordance with 14 CFR, section 105.21(a), a certificate of authorization is required when conducting parachute operations over or into a congested area of a city, town, or settlement, or an open-air assembly of persons. The person conducting the parachute operation must apply to the local Flight Standards District Office for the certificate of authorization. This certificate addresses the safety aspects of the operation for persons and property on

the ground and does not replace the ATC clearance or authorization needed for operations within Class A, B, C, or D airspace.

根据 14 CFR 的 105.21（a）规定，在城市、城镇、居民点的拥挤区域或露天人员集会区域上空或进入这些区域进行降落伞作业时，需要有授权证书。进行降落伞作业的人员必须向当地飞行标准局申请授权书。本证书涉及地面人员和财产的安全事项，并不能替代在 A、B、C 或 D 类空域内进行作业所需的空中交通管制许可或授权。

5. Are air traffic controllers required to issue traffic advisories to jump aircraft?
空中交通管制员是否需要对降落伞作业飞行器发布交通建议？

Yes. FAAO 7110.65, Air Traffic Control, paragraph 9-8-4, requires that controllers issue traffic advisories to the jump aircraft before the jump. Controllers must issue advisories to all known aircraft that will transit the airspace when the jump operations will be conducted.

对。FAAO 7110.65 - 空中交通管制，9-8-4 款，要求空管人员在跳伞前向降落伞作业飞行器发出交通建议。空管员也必须向所有已知的将在进行降落伞作业时飞越相关空域的其他飞行器发出建议。

6. Are air traffic controllers required to separate jump aircraft that operate within a Class E airspace area?
空中交通管制员是否须将 E 类空域内的跳伞作业飞行器分开?

No. Traffic advisories shall be provided, but ATC is not required to separate visual flight rules aircraft within Class E airspace. However, in accordance with FAAO 7110.65, Air Traffic Control, paragraph 9-8-4, ATC may assist pilots of non-participating aircraft that request help in avoiding the jump airspace. In addition, if there is other traffic in the jump area, ATC does not authorize or deny jump operations due to traffic. The jump pilot shall be issued traffic advisories. The jump pilot and jumpers will make a decision on whether or not to allow the jumpers to leave the aircraft. 14 CFR, section 105.5, clearly places the burden on the jump pilot and parachutist by stating that no person may conduct a parachute operation and no pilot in command of an aircraft may allow a parachute operation to be conducted from an aircraft, if that operation creates a hazard to air traffic or to persons or property on the ground. (ATO-R System Ops)

不用。空管员应提供交通建议，但空中交通管制不要求将 E 类空域内处于目视飞行规则的飞行器分开。然而，根据 FAAO7110.65，空中交通管制，第 9-8-4 段，空中交通管制可以协助请求帮助的非参与作业的飞行器的飞行员避开跳伞空域。此外，即使跳伞空域有其他飞行器，空中交通管制也不能据此授权或拒绝降落伞作业。但应向降落伞作业飞行器的飞行员发出交通建议。飞行员和跳伞者将决定是否允许跳伞者离开飞行器。14 CFR 第 105.5 节明确规定，如果降落伞作业对空中交通或地面人员或财产造成危害，任何人不得进行跳伞，任何飞行器的飞行员也不得允许在飞行器上进行降落伞作业（ATO-R 系统操作）。

—July 2004
—2004 年 7 月

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）。
Acronym. 1. 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 which 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”的缩写

见“AUTOMATIC ACTIVATION DEVICE”（自动激活装置）

ACCELERATED FREEFALL (AFF), USPA：自由落体跳伞学生培训方法，缩写 AFF

是在肯·科尔曼（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 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.

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.

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

腹飞或背飞时的一种机动动作，比起开伞前分离时使用的 Tracking（为尽可能在水平方向上与其他跳伞者分开距离而执行的，下落最慢的 Tracking），Angle 的飞行角度更大（但不是完全垂直于地面，直上直下）。

A degree of back/belly flying that has a steeper angle than tracking used at breakoff. (achieving maximum horizontal separation or lift). This angle is much steeper but not fully vertical (straight up and down).

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.

ANGLE OF INCIDENCE：俯仰角

指飞机机翼或降落伞伞翼的翼弦相对于水平面的夹角（机翼或伞翼前缘朝上或朝下时）。

The relative pitch (leading edge up or down) angle of a wing measured between the chord line and the horizon.

APPROACH ANGLE：进近角

另见“GLIDE PATH”（滑翔航迹）

APPROPRIATELY RATED：获得合适评级的

（形容词）表示 USPA 教练或考官获得了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。

adj. 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.

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。

n. 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

一类跳伞比赛项目，包括自由飞、自由式、空中滑板。

Skydiving competition events that include freeflying, freestyle skydiving, and skysurfing.

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：冲压空气式降落伞伞布的展弦比（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

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。（FAR 105 条款定义）

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 执照的人员有权参加 USPA 大学四人团体编队跳伞活动，可以进行夜间跳伞，可以在有相关资质后申请 USPA 初级教练（Coach, USPA）评级。

The second level USPA license. Persons holding a USPA B License are authorized to participate in the USPA collegiate 4-way formation skydiving event, perform night jumps, and when qualified, apply for a USPA Coach rating.

BARREL ROLL：横滚

又称滚筒翻，指在自由落体过程中跳伞者以自身（身高方向）为旋转轴进行翻滚的动作。

A maneuver in which a skydiver rolls about their longitudinal axis.

B.A.S.E. JUMPING：低空跳伞

又称定点跳伞，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.

B-12S：夹扣

（行话）有些降落伞背带上用于连接腿带的金属夹。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

见"DEPLOYMENT DEVICE"（开伞装置）

BAG LOCK：D 包锁死

降落伞飞出伞包后，伞布仍留在 D 包中的故障。

n. A malfunction of a deployed parachute where the canopy remains in the deployment bag.

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): n. 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.

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，腹部朝下（腹部朝地）的自由落体姿态

见"FLAT FLYING"（平飞）

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；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；可从 USPA 现任董事会成员中选举官员。USPA 董事会由以下人员组成：全国性经理—由全体会员选举产生的董事；2. 区域经理—由各地区内的跳伞者选出并负责代表他们的利益的经理；3. 依职权代表国家航空协会（NAA）的成员。

Those representatives elected by the general members of USPA every three years as set forth in the USPA By-Laws; authorized by the by-laws 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 by-laws; 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; and 3. An ex officio member representing the National Aeronautical Association.

BRAKED TURN：带刹车转弯

降落伞打开后，跳伞者先刹车降低伞的前进速度，然后通过控制刹车以允许伞的一侧比另一侧稍微飞快一点来改变航向。带刹车转弯可以用来减少转向时的高度损失。

A turn under an open parachute canopy made by using the steering toggles to slow the forward speed of the canopy and then allow one side to fly slightly faster to change heading. Used to reduce altitude loss in a turn.

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.

BRAKES：刹车

1. 冲压空气式（ram-air）降落伞的方向操纵装置（另请参见 TOGGLES）。2. 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。

n. 1. The steering controls of a ram-air parachute. (see also TOGGLES) 2. n. 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。

v. 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。

n. 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 包或降落伞的伞衣上。

n. 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

第三级别的 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

中文又称降落伞伞衣，也可简称伞布、伞衣，是降落伞的主要部分，由薄膜布料组成，通过悬挂线与降落伞背带（harness）相连，使得跳伞者能够安全下降（*译者注：CANOPY 即降落伞顶部的“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 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。2. 国际航空运动联合会（FAI）的涉及降落伞编队建立的竞赛项目。

n. 1. The intentional maneuvering of two or more open parachute canopies in proximity to or in contact with one another during descent. 2. The FAI competition discipline involving the building of canopy formations.

CANOPY RELEASE：降落伞释放装置

一种能使降落伞及其组提带与背带系统立即分离的装置。

A device which allows immediate separation of the parachute canopy and risers from the harness.

（译者注：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：三环降落伞释放装置（3-Ring Canopy Release）、反三环降落伞释放装置（Reverse 3-Ring）、锁扣式降落伞释放装置（Parachute Canopy Release），本手册中所提到的降落伞释放装置主要指目前主流的三环系统）

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。

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。

n. 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

（形容词）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。

adj. 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。

n. The longest dimension from the front to the back of a wing at any given point along the span.

CHUTE ASSIS：坐飞（法语）

法语，意为“跌坐”，该自由飞姿势最初由法国人开发。见“SIT FLYING”（坐飞）

n. French for “falling seated,” a freeflying orientation credited to that country. (see also SIT FLYING)

CLEARED：获准的

（形容词）指学生收到了 USPA 教练的签名，获准进入下一阶段的学习。

adj. Refers to a student who has received a signature from a USPA Instructor to advance.

CLIMBOUT：爬出舱门

跳伞者把自己置于飞机门内或门附近，或挂在飞机外部的突起物或结构上准备跳出的动作，团体跳伞常用。

n. The act of a jumper positioning himself or herself 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 初级教练）

n. A non-rated operative who provides advanced skydiving training. (see also COACH, USPA)

（译者注：这里将提供高阶跳伞科目培训（如翼装、自由飞等）的教学人员称为“科目教练”，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”与教学评级体系中的“Coach, USPA”（即 USPA 初级教练，常省略 USPA）基本一致，应注意区分，在本手册的翻译中，为示区别，将此类教学人员统称为科目教练，或视具体情况称为“翼装教练”、“自由飞教练”等）

COACH, USPA：USPA 初级教练

USPA 入门级教学评级，持有者可以教授一般内容（第一跳课程中的非特定训练方法部分），可以进行团体自由落体技能训练和伞控训练，也可以与学生跳伞，以上均需要在 USPA 教练的监督下进行。

n. 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：教练跳

教练跳指 USPA 初级教练和任何其他人一起进行的跳伞，并向那个人提供指导或评价。

n. 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

一种手动释放的引导伞，开伞后引导伞会自动缩起来。

A hand-deployed pilot chute that automatically collapses after deployment.

COLLAPSIBLE SLIDER：可折叠滑块布

也可译作可折叠方块布，它可以折叠或缩起来，以便跳伞者减少阻力。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 which is designed to release the non-RSL side riser in the event the RSL side riser breaks.

CONTAINER：伞包

降落伞系统中的一部分，在降落伞打开之前将折叠好的降落伞的伞布包起来储放。

The portion of the parachute system that closes around and stores the folded parachute canopy and deployment device until deployment.

CORK：软木塞（行话）

在高速的团体自由落体机动中，失去控制并迅速减速。

v.(jar.) During high-speed group freefall maneuvers, to lose control and decelerate rapidly.

CREW：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。

(adj.) 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。一些 RSL 系统也使用组提带连接带来连接左右侧的组提带，以防止在仅一个组提带被释放时备伞过早打开。

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. Also used with some reserve static-line systems and attached from side to side to prevent premature reserve deployment if only one riser is released.

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。

n. 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.

CUTAWAY：切伞

跳伞者在启动备用降落伞前断开主降落伞的程序。在以下情景中使用：主降落伞发生故障时，须要防止与展开的备伞纠缠的情况下；在降落伞与另一个跳伞者缠上的情况下；以及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，通常位于跳伞者右侧胸部，用于启动切伞。有时也称为三环释放把手。

Pillow or loop handle of a two-handled system, normally located on the jumpers right-side chest, used to initiate a cutaway. Sometimes referred to as a three-ring release handle.

D

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 or 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

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

在启动开伞程序后，降落伞从伞包中出来，并在充气前完全展开。

After activation, extraction of the parachute from the container and full extension of the system prior to inflation.

DEPLOYMENT DEVICE：开伞装置

降落伞的中介容器袋子，一般指 D 包，在伞绳（在开伞过程中）被完全释放之前，该容器袋子被用于容纳或包裹叠好的降落伞。

Intermediate container, usually a bag (D-bag), that contains or constricts the folded parachute through complete line deployment.

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.

DIAPER：棱布

一种开伞装置，由一块布料板构成，该布料板附着在降落伞伞布的下部，可在伞绳完全伸展之前防止伞布充气膨胀。经常与圆形降落伞一起使用，以减少开伞冲击和故障。

A type of deployment device consisting of a fabric panel attached near the lower part of a canopy which prevents canopy inflation until full line stretch. Used frequently with round parachutes to reduce opening shock and malfunctions.

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.持证装备师（Rigger）亲自监督未持证人员叠主降落伞，以确保其正确操作，并对该次叠伞负责（FAR 105 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.

DIVER EXIT：俯冲出舱

又称下潜式出舱，指从飞机舱门处向外俯冲下潜离开飞机；不借助机身结构的辅助来达到平稳出舱。

Leaving an aircraft by diving out of the aircraft door; made without positioning or bracing to achieve a stable entry into the airstream.

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。

v. To make physical controlled contact with another skydiver while in freefall; or, when building canopy formations, with another jumper's canopy.

DOOR EXIT：舱门出舱

见“DIVER EXIT”（俯冲出舱）

DOWNWIND：下风向

1.（形容词）气流运动的去向。

adj. The direction toward which the air is moving.

2.（形容词或副词）在下风处。

adv. or adj. positioned farther along the wind's path.

3.（行话）顺风着陆。

n.(jar.) 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降速度。

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。（FAR 105 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.

DUMMY RIPCORD PULL (DRCP)：模拟拉动开伞拉索

见“PRACTICE DEPLOYMENT”（模拟开伞练习）

DYNAMIC STALL：动态失速

一种在冲压空气式降落伞拉平后发生的情况，降落伞的负载（即跳伞者）在刹车后被向前甩，然后向后摆动。另见“REVERSE FLIGHT”（倒退飞行）和“STALL”（失速）

n. An action that occurs following the flare of a ram-air canopy, where the load(jumper) has swung forward under the canopy from the braking action and begins to swing back.(see also REVERSE FLIGHT and STALL)

E

ELLIPTICAL：椭圆伞型

指一类降落伞，该类降落伞的形状是两端渐缩的或近似椭圆的平面形状。

n., adj.(jar.) 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

为某人或某事物做公开背书认可或支持的行为。

An act of giving one’s public approval or support to someone or something.

EXAMINER, USPA：USPA 考官

教学评级程序的最高级别。考官是经验丰富的 USPA 教练，他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 of 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设备的重量总和。

The combined weight of the jumper and all his or her 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。

n. 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“FEDERATION AERONAUTIQUE 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。

(jar.) Unenlightened 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 Code of Federal Regulations that apply to aviation.

FEDERATION AERONAUTIQUE 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 which 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：在不同语境下有以下含义

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。

v. 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。

v. In freefall: To decelerate prior to approaching a formation.

3. Flare 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。

n. The act of flaring.

4. 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。

n. A membrane used to distribute the load of a parachute at the line attachment points of some canopies.

FLAT DELTA：平面三角姿势

躯体在一个平面上的自由落体姿势，双腿伸直，手臂向后仰，是 Tracking 的起始动作或中间转换动作。

Freefall position with the body on one plane, legs extended and arms swept back, used as a starting or intermediate position when developing a track.

FLAT FLYING：平飞

一种自由落体姿态，腹部朝向地面。

Freefall orientation primarily belly to earth

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：舱外离机者

指处在飞机外部，并稍早于作为自由落体团体基准（Base）的人离开飞机的跳伞者，另见“BASE”（基准）。该跳伞者在基准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.

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（FAR 105 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（平飞）比赛的其中一个比赛科目。

1. Aerial maneuvers by two or more freefalling skydivers with each other, usually to form geometric formations. 2. Competition discipline of flat-flying.

FREE BAG：飞包

降落伞的中介容器袋子，在伞绳（在开伞过程中）被完全释放之前，该容器袋子被用于容纳或包裹叠好的降落伞，但不附连在处于打开过程的降落伞伞布上（*译者注：开伞即与降落伞分离，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.

FREE FLY：自由飞（动词）

在与其他跳伞者无连接的情况下出舱。

v. To exit unlinked with other jumpers.

FREEFALL：自由落体

出舱和降落伞打开之间的阶段，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。（FAR 105 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)

FREEFLYING：自由飞（名词）

1. 自由落体运动的其中一种，特点是跳伞者相对于气流来流采取多种不同姿态。另见“SIT FLYING”（坐飞）和“HEAD DOWN”（倒飞）。

n. 1. An unrestricted freefall discipline characterized by varied presentations to the relative wind.(see also SIT FLYING and HEAD DOWN)

2. 自由飞竞赛项目。

n. The competition event of freeflying.

FREESTYLE：自由式

1. 自由落体运动的其中一种，由一位跳伞者单独进行，过程中含编排好的、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. 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飞行的稳定状态。

The stabilized state of hands-off 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。

n., v. A freefall skydiving formation which 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

降落伞垂直和水平运动结合的下降运动。

n., v. The combined horizontal and vertical movement of a descending canopy.

GLIDE ANGLE：滑翔角

见“GLIDE PATH”（滑翔航迹）

GLIDE PATH：滑翔航迹

降落伞在向地面降落点飞行时的轨迹。

The trajectory of a parachute as it descends in flight towards a landing point on the ground.

GO-AROUND：盘旋

指飞机在跳伞高度盘旋（*译者注：注意于飞机的“复飞”作区别*）。

n.(jar.) 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 By-Laws.

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

HAND-DEPLOYED PILOT CHUTE：手抛式引导伞

一种在自由落体过程中用手抛出的小伞，用来从主伞伞包中抽出主伞。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：跳伞者自行手动打开主伞的方式分为两大类：拉索系统以及手抛式引导伞，其中手抛式引导伞又分为两小类：第一小类是拉出式引导伞，即 Pull-out Pilot Chute，简称 POP，第二小类是抛出式引导伞，即 Throw-out Pilot Chute，简称 TOP。使用拉索系统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，这种开伞方式目前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。最常见的主伞开伞方式是抛出式开伞：跳伞者拉出引导伞，引导伞拉出关包针，从而释放主伞，其次为拉出式开伞：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）

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。在

评级课程中，跳伞者必须在“硬甲板”高度以上完成某动作以证明其执行该动作的能力。

A predetermined altitude above which an action must occur or below which an action must not occur. In rating courses, it indicates a minimum altitude by which a certain maneuver must be performed in order to get credit for the action.

HARNESS：背带

降落伞的背带，用来将降落伞绑定在跳伞者身上。

n. 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

（形容词或副词）指头朝下，身体垂直或近乎垂直于地面的自由飞姿态。

adj., adv. 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，用于跳伞者执行高性能着陆的区域。

An area at a drop zone that DZ management has designated as separate from the normal landing area for canopy pilots to perform high-performance landings.

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

一种会导致降落伞陡峭俯冲的降落伞机动。

(jar.) A canopy maneuver that results in a steep dive.

HOOKER HARNESS：胡克安全带

一种单点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，拉出伞包的降落伞的一部分与跳伞者或其装备缠在一起。

n. A partial parachute malfunction where part of the deployed parachute is entangled with the jumper or his or her equipment.

I

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“INSTRUCTORI-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

一本包含为 USPA 初级教练和 USPA 教练进行评级的课程所需的文件集合以及参考资料的手册。

The manual containing the collected documents and references required to conduct any course for USPA Coach or USPA Instructor ratings.

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 初级教练，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: USPA Accelerated Freefall, 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

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

跳伞者在即将离机前，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跳伞教练，其负责协调跳伞者的登机和离机顺序，飞行程序，看点定位，以及与飞行员协调紧急程序。

n. 1. 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）。

v. 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。

n. 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 alter performance.

L

LANDING PATTERN：着陆航线

在降落伞降落的最后阶段，跳伞者使用的经过预先计划的飞行路线，通常是矩形的。

n. 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。

n. 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）。

n. 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)

M

MAE WEST：部分倒转（旧称）

行话，为部分倒转的旧称，二战时期使用。见“PARTIAL INVERSION”（部分倒转）

n.(jar., archaic) WWII term for partial inversion.(see also PARTIAL INVERSION)

MAIN-ASSISTED RESERVE DEPLOYMENT (MARD)：主伞辅助备伞开伞装置（MARD）

一种利用切伞后主伞产生的阻力辅助打开备伞的装置。

A device which uses the drag from the cutaway main canopy to assist in extracting the reserve canopy.

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（FAR 105 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：高级降落伞装备师

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)

MSL：海拔高度

以海平面为基准测量的高度。

Altitude measured from sea level.

N

NAA：美国国家航空协会（缩写）

见“NATIONAL AERONAUTICAL ASSOCIATION”（美国国家航空协会）

NAS 804：NAS 804 标准

意为“国家飞行器标准 804”，它定义了在 TSO C-23b 标准下，降落伞为获得批准所必须满足的试验、最低性能和安全标准。TSO C-23b 标准于 1949 年采用，并于 1984 年被 AS 8015A 标准取代。

NAS 804 (National Aircraft Standard 804) defines the tests and minimum performance and safety standards which must be met for a parachute to receive approval under TSO C-23b. Adopted in 1949 and superseded in 1984 by AS 8015A.

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：全国性经理

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 FAR 105 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 AIRMEN)：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（FAR 105 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

行话，指降落伞展开和充气时施加在降落伞载荷上的减速力，由降落伞以及其相关物的空气阻力引起。

(jar.) 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一侧而不朝向胸部的某个降落伞拉索（Ripcord）。

Facing to the outside, such as a ripcord facing to the side of the jumper rather than toward the breast bone.

P

PACK：叠伞

叠起降落伞并关包，为跳伞做准备。

v. 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 which 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（FAR 105 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（FAR 105 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分散落地的冲击力。

n. 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（FAR 105 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, jump master, 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（FAR 105 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（FAR 105 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.

PARAGLIDING：滑翔伞

一种使用类似降落伞的冲压空气式伞翼来滑翔的运动。起飞通常由步行开始，从小山出发或由地面牵引拉起。由于滑翔伞不符合联邦航空局对“从飞行中的飞行器降落到地面的物体”的定义，因此不受联邦航空局的监管，也不受 USPA 的管辖。

n. (also Parapente): An activity involving the use of a ram-air inflated wing, resembling a parachute, for gliding. Flights typically initiate by foot- launching from a hill or from a ground-based tow. Because paragliding 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.

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（FAR 105 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。（FAR 105 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 连上降落伞的一种方法。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。Static Line 通常使用魔术贴或强度已知的可断绳线。

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 velcro strip or break cord of known strength is used.

PIN：根据不同语境有以下含义

1. **抓住**

（动词）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。

v. To fly to another jumper and take grips on the jumper (freefall) or canopy (canopy formation).

2. **二号跳伞者**

（名词）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。

n. The first jumper to make contact with the base, or target jumper, to begin a formation.

3. **关包针**

（名词）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。

n. Retaining device that when passed through a closing loop, locks the parachute system closed until activation.

PIN CHECK：跳前检查

（行话）跳伞前的检查。

n.(jar.) Pre-jump inspection of the parachute.

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。

n. A compressed vertical canopy formation.

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

（动词）指把降落伞 Stack（堆叠式）编队压得更紧凑的动作。

v. The act of compressing a parachute stack.

POISED EXIT：扒机身出舱

跳伞者跳出飞机的过程中，借用飞机外部结构作为支点，以能够在离开飞机时立即获得稳定的姿态。

A departure from an aircraft wherein the jumper uses an external structure as a brace to assist in gaining a stable position immediately upon leaving the aircraft.

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

根据降落伞的滑翔轨迹，预计在地面的着陆点。

The expected landing spot on the ground, based on the glide path of the parachute.

PROP BLAST：螺旋桨气流

1.（名词）螺旋桨产生的气流，产生推力。

n. The airflow created by a propeller that is developing thrust.

2.（名词）行话，指出舱时跳伞者面对的相对气流

n.(jar.) relative wind on exit

PUD：软握把

（行话）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。

n.(jar.) 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

一种手动的降落伞启动系统。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”（手抛式引导伞）。

n. 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（FAR 105 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 教学评级持有者的会议，在会上，与会者交流信息，介绍和讨论新的想法，并开发，改进或确保跳伞教学的质量。

A meeting of USPA instructional rating holders to exchange information, introduce and discuss new ideas, and to develop, improve, or assure the quality of skydiving instruction.

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 which are derived from experience or theory, compiled by USPA, and offered for guidance.

REGIONAL DIRECTOR, USPA：USPA 区域经理

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。

Members 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（有些开伞系统甚至可拆下 D 包和引导伞）拆下来的开伞系统，主要被进行高性能伞控动作的跳伞者使用，目的是减小降落伞飞行的阻力。

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 and helps 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（FAR 105 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，用于在对已被拉出伞包的主伞进行切伞之后打开备伞。

A connection between the main risers and the reserve activation system intended to initiate reserve activation following the release of a deployed main parachute.

REVERSE FLIGHT (FULL STALL)：倒退飞行（完全失速）

一种非正常飞行状态的降落伞机动，它会使降落伞伞布塌缩并旋转。拉下刹车直至伞的后缘低于前缘时，降落伞就会出现这种情况。它可能导致无法恢复的降落伞故障。另见“STALL”（失速）和“DYNAMIC STALL”（动态失速）。

A non- flying canopy maneuver that collapses the canopy and may cause it to spin. Results from depressing the toggles until the trailing edge is lower than the leading edge. May result in an unrecoverable malfunction.(see also STALL and DYNAMIC STALL)

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：装备

(jar.)（行话）

1.（名词）用于跳伞的完整降落伞系统。

n. 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。

v. The act of maintaining, repairing, or modifying a parachute system.

3.（动词）穿上降落伞装备（Rigging Up）。

v. To don a parachute (Rigging Up).

RIGGER：降落伞装备师

联邦航空局认证的降落伞技师。另见“MASTER RIGGER”（高级降落伞装备师）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构成的装置，当它被拉动时，能启动降落伞系统的某个动作。

An assembly, usually constructed with a metal cable that, when pulled, activates an operation on a parachute system.

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 区域经理任命来代表他（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 区域经理验证符合 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 which 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

指学生培训过程中的一个进度点，在这个阶段，学生被 USPA 教练批准在没有 USPA 教练监督的情况下进行自由落体，但学生还没有完成 USPA A 执照的所有要求。在 USPA 团体会员跳伞基地，所有获准进行自我监督的跳伞者必须有在有效期内的 USPA 会员资格。详见综合学生计划 E 单元的序言。

The point within a student's training when he has been cleared by a USPA Instructor to jump without instructor supervision in freefall but has not yet completed all of the requirements for the USPA A license. At USPA Group Member skydiving centers, all skydivers cleared for self-supervision must be current USPA members. See Category E: Introduction of the Integrated Student Program.

SENIOR RIGGER：资深降落伞装备师

联邦航空局的初始降落伞装备师认证级别，允许该认证的持有人叠伞和维护降落伞系统，并进行简单维修。另见“MASTER RIGGER”（高级降落伞装备师）。

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)

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，带有一个既连接备伞拉索又可单点释放组提带的把手。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 ripcord 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（FAR 105 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

基于坐姿的垂直自由飞姿态。另见“CHUTE ASSIS”（坐飞（法语））。

Upright vertical freefly orientation based on a seated position.(see also CHUTE ASSIS)

SKYBOARD：天空滑板

见“SURFBOARD”（冲浪板）

SKYDIVE：跳伞

1. （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。

n. 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.

2.（动词）从飞行器上带降落伞跳下来。

v. 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、相关联邦航空局参考资料，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

1. 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).

2. 以本名称命名的跳伞比赛项目。

The competition event by that name.

SLIDER：滑块布

也称方块布。一种在降落伞打开充气过程中，通过沿着伞绳悬挂线逐渐向下滑动来控制降落伞伞布充气的装置。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

Performance Designs 公司开发的一种 Spectra 材质连接器，用于将降落伞伞绳连接到组提带上。

A type of Spectra fabric connector link developed by Performance Designs, Inc., for attaching the lines of the parachute to the risers.

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）

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（科目），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

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 which 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、有计划的运动。

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

降落伞的一种飞行状态，特征是降落伞的滑翔能力下降和下落速度加快。另见“DYNAMIC STALL”（动态失速）和“REVERSE FLIGHT”（倒退飞行）。

n. The state of canopy flight control characterized by decreased glide and increased rate of descent.(see DYNAMIC STALL and REVERSE FLIGHT)

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, 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（绳拉跳伞）

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：跨扣

见“THREAD-THROUGH”（Thread-thru 式调节扣）

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。

n. A rigid panel, similar to a snowboard, attached to a jumper’s feet.

SUSPENSION LINES：伞绳悬挂线

从降落伞伞布的底部连接到组提带上的伞绳，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; SWOOP DITCH：拉飘池；拉飘渠

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（FAR 105 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（FAR 105 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

降落区的着陆区域。对于官方认可的跳伞比赛则使用一个 3 厘米圆盘。

The landing area on a drop zone. For officially sanctioned competition, a three- centimeter disk.

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 (STEP-THROUGH)：Thread-thru 式调节扣（跨扣）

（行话）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）。

(jar.) n. 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（“单点”意即单个把手可释放两个组提带），由比尔·布斯发明。该系统的基础是每个组提带上的三个互锁的金属环，三个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。

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.（名词或形容词）一种手动降落伞启动系统。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”（手抛式引导伞）。

n., adj. 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）行话，意即启动开伞程序。

v.(jar.) To initiate deployment.

TOGGLES：操纵棒（即刹车）

有时也叫做刹车棒，是连接降落伞操纵线（刹车线）末端的手柄。见“BRAKES”（刹车）。

n. Handles attached to the ends of the steering lines of a parachute canopy.(see also BRAKES)

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，以达到最高水平速度。

n. 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，以最高的水平方向速度移动。

v. To move at maximum horizontal speed in freefall.

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.

TRIM TABS：配平片

一种前组提带的滑轮系统，用于调整伞的俯仰角或飞行姿态。

A front riser pulley system for adjusting a canopy’s angle of incidence or flight attitude.

TSO-C23：技术标准规定-C23

见“TECHNICAL STANDARD ORDER”（技术标准规定）

TURBULENCE：乱流

也叫做湍流，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.

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（BSR）的豁免。2.（行话）责任免除。

n. 1. Exception to the BSRs filed by a USPA official indicated in SIM Section 2-2. 2.(jar.) A liability release.

WATER JUMP：刻意水降

刻意降落在开阔水域的跳伞

n. A skydive which includes intentionally landing in an open body of water.

WHUFFO：非跳伞者

（黑话）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？”）。

n.(jar.) 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。

n. A device used to determine the wind drift which 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. Usually a weighted strip of crepe paper 10 inches wide and 20 feet long.

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。

n. The jumper's exit weight divided by the area of the parachute canopy, expressed in the United States in pounds per square foot.

WING SUIT：翼装

一种连体式滑翔跳伞服，在两条腿之间，以及在手臂和躯干之间有膜状编织布料。

n. 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

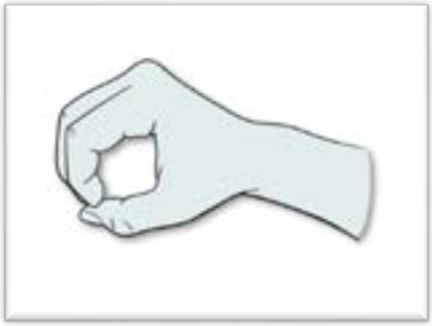
指混乱无组织的跳伞，许多跳伞者偏离了其本应处于的垂直和水平方位。

A skydive that becomes chaotically disorganized with many jumpers out of position both vertically and horizontally.

附录 A：自由落体手势
Freefall Hand Signals

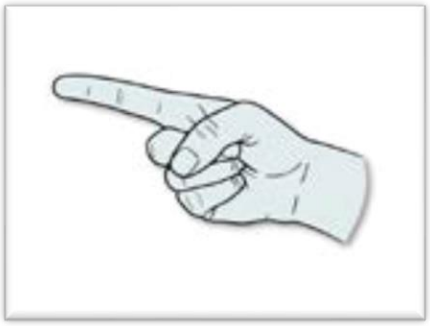
顶胯（弓形姿态）
pelvis forward (arch)

高度意识（检查高度）
circle of awareness (altitude check)

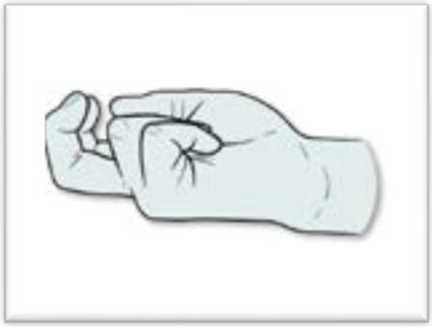


OK
OK

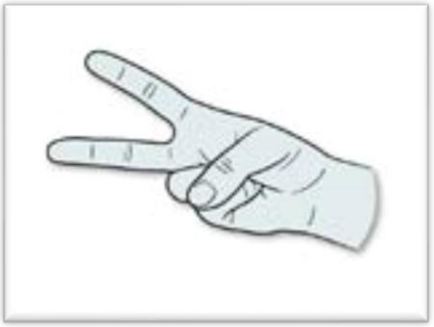
开伞（拉出引导伞）
deploy the parachute (pull)



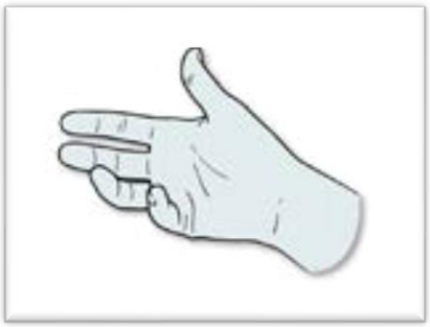
腿收一点（弯一点）
legs in (retract legs slightly)



腿伸展 6 英寸并保持
extend legs six inches and hold

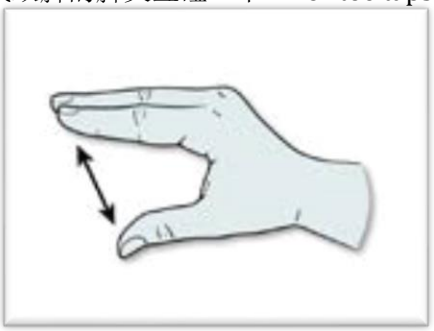


张开手 （释放引导伞）
open hand (release pilot chute)

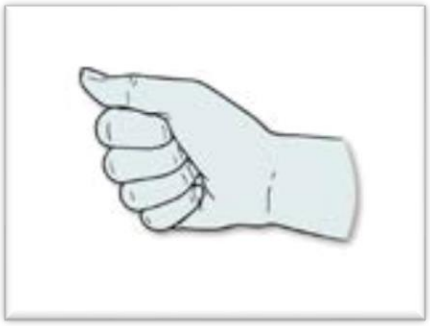


检查手臂姿势
check arm position

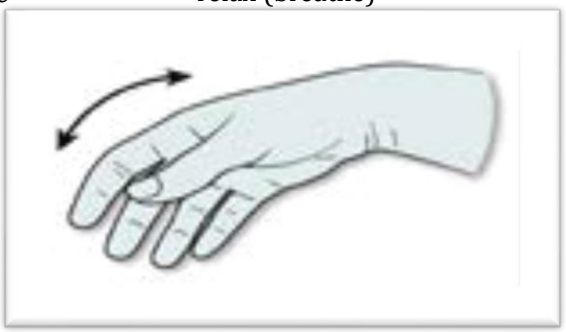
膝盖并拢一点 knees together slightly
或双脚的脚尖互碰一下 or toe taps



执行模拟开伞步骤
perform the practice deployment sequence



放松（呼吸）
relax (breathe)



附录 B：USPA 单元测验答案
USPA Category Quiz Answers

CATEGORY A「A 单元」

1. Approach fixed-wing aircraft from the rear. (first-jump course outline)
   从后方接近固定翼飞机。（第一跳课程大纲）
2. pilot and jumper (FAR 91.107.A.1 through .3)
   飞行员和跳伞者（FARs 91.107.A.1 至.3）
3. movement on the surface (taxi), takeoff, and landing (FAR 91.107.A.2)
   飞机在地面运动（滑行）、起飞和着陆期间（FAR 91.107.A.2）
4. my instructor (first-jump course outline)
   我的教练（第一跳课程大纲）
5. AFF and tandem students: helps student and instructors to leave at the same time; all students: to leave at the right place over the ground (first-jump course outline)
   对于 AFF 和双人伞学生：有助于学生和教练同时跳出；对于所有学生：跳出时位置对应在地面上方的正确位置（第一跳课程大纲）
6. ahead (first-jump course outline)
   从前面（第一跳课程大纲）
7. best position for deployment (first-jump course outline)
   最佳开伞姿势（第一跳课程大纲）
8. dives (first-jump course outline)
   俯冲（第一跳课程大纲）
9. a. Land with the wing level and flying in a straight line.
      降落伞时水平姿态，直线飞行着陆。
   b. Land in a clear and open area, avoiding obstacles.
      降落在一个空旷开阔的区域，避开障碍物。
   c. Flare to at least the half-brake position
      拉平（Flare）至少到半刹车位置。
   d. Perform a parachute landing fall (first-jump course outline)
      执行 PLF
   （第一跳课程大纲）
10. convert forward speed to lift (first-jump course outline)
    将前进速度转换为升力（第一跳课程大纲）
11. Student should demonstrate: feet and knees together, hands and elbows in, roll on landing. (first-jump course outline)
    学生应：双脚和膝盖并拢，双手和肘部朝内（至身体轴线，不朝外展），在着陆时滚动（第一跳课程大纲）
12. Note to tandem students: Your instructor may teach you a modified PLF that is more appropriate for tandem equipment.
    双人伞学生注意：你的教练可能会教你一种更适合双人伞装备的 PLF。

CATEGORY B「B 单元」

1. USPA Instructor rated for my discipline (BSRs 2-1.F.2.b)
   持有对应学生培训方法的教练评级的教练（基本安全要求 2-1.F.2.b）
2. altitude awareness to recognize and act at the assigned pull altitude (Category B outline)
   保持高度意识，能知道自己是否在指定开伞高度，并在开伞高度有所行动（B 单元大纲）

3. ten mph for a round reserve canopy; 14 mph for a ram-air reserve, waiverable by an S&TA (BSR 2-1.G.1)
圆形备伞为 10 英里/小时；冲压空气式备伞为 14 英里/小时，安全和培训顾问可以豁免该要求（基本安全要求 2-1.G.1）
4. Change body position to modify the air flow over my back (Category A and B outline)
改变身体姿势来改变背部的气流（A、B 单元大纲）
5. 2,500 feet (SIM 5-1.E)
2500 英尺（SIM 5-1.E）
6. a. Before releasing the brakes, spread risers or twist risers to transfer line twist to risers, kick in opposite direction, watch altitude to 2,500 feet.
在释放刹车之前，展开组提带或扭转组提带，将伞绳的扭曲转移至组提带，腿朝相反方向踢，保持警觉，看高度是否低于 2500 英尺。
b. Pump rear risers or steering controls at the bottom of the stroke while watching altitude to 2,500 feet.
往返拽后组提带，或把刹车棒拉到底，同时观察高度，直至 2500 英尺。
c. Pull toggles to flare position and hold (or pull down rear risers and hold) and watch altitude. If stubborn, determine controllability with turn and flare by 2,500 feet.
拉动刹车至拉平位置并保持（或拉下后组提带并保持），并观察高度。如果无法解决，在 2500 英尺以上可以通过转向和拉平来评估降落伞的可控性。
7. Immediately deploy the reserve parachute, but not below 1,000 feet with an SOS system. (Category A and B outline)
立即打开备伞，除非低于 1000 英尺时用的是单把手紧急系统（SOS）（A、B 单元大纲）
8. If the canopy flares and turns correctly, it is probably safe to land (Category A and B outline)
如果降落伞拉平和转向没有问题，那可能是可以安全着陆的（A、B 单元大纲）
9. no more than two tries or two seconds to locate and deploy the main pilot chute; if no success, cut away and deploy the reserve (SIM Section 5-1.E)
不得超过两次尝试，或花超过两秒钟，来找到和释放主伞的引导伞；如果没有成功，则切断主伞并开备伞（SIM 5-1.E）
10. Cut away and deploy the reserve. (Category A and B outline)
切断主伞并开备伞。（A、B 单元大纲）
11. Cut away and deploy the reserve. (Category A and B outline)
切断主伞并开备伞。（A、B 单元大纲）
12. local runway headings (Instructor)
本地跑道的航向（问教练）
13. cardinal directions of the reference runway (Instructor)
参考跑道的基本朝向（问教练）
14. local runway length (Instructor)
当地跑道长度（问教练）
15. downwind (with the wind), base (across the wind but downwind of the target), and final (into the wind) (Category A and B outline)
下风边（顺风），基线边（侧风，在着陆目标区域的下风处），着陆边（逆风）（A、B 单元大纲）
16. local pattern entry altitude (Instructor)
当地机场航线（Traffic Pattern）的进入高度（问教练）
17. approaching and departing aircraft (Category B outline)
有进场及离场的飞机（B 单元大纲）

CATEGORY C「C 单元」

1. 5.5 seconds (Category C syllabus)
5.5 秒（C 单元教学大纲）

2. altitude, arch, legs, relax (Category C syllabus)
   高度，弓形，控腿，放松（C 单元教学大纲）
3. Pull at the planned altitude, regardless of stability. (Category C syllabus)
   在计划的高度开伞，不管姿态是否稳定。（C 单元教学大纲）
4. to signal other jumpers (Category C syllabus)
   向其他跳伞者发出信号（C 单元教学大纲）
5. It protects against hard landings, and all skydivers have hard landings (Category C syllabus)
   在硬着陆时保护跳伞者，所有跳伞者都有可能遭遇硬着陆（C 单元教学大纲）
6. the intersection of the base and final approach legs (Category C syllabus)
   基线边（第二边）和最后进近边（第三边）的交点（C 单元教学大纲）
7. shortens the final approach, shortens the base leg, lengthens the downwind leg, and places the planned pattern entry point farther upwind (Category C syllabus)
   最后进近边（第三边）缩短，基线边（第二边）缩短，下风边（第一边）延长，并将计划的着陆航线起始点往更上风处的位置挪动（C 单元教学大纲）
8. 10-20 times the height of the obstacle (Category C syllabus)
   障碍物高度的 10-20 倍距离范围内（C 单元教学大纲）
9. Keep the canopy flying in a straight line at full flight (or as directed by the owner's manual). (Category C syllabus or owner's manual)
   保持降落伞在全速飞行状态（无刹车）下直线飞行（或按照用户手册的指示）（C 单元教学大纲或用户手册）
10. according to the local landing area and obstacles (Instructor)
    视本地着陆区域和障碍物的情况而定（问教练）
11. keeps them in place and prevents accidental or premature deployment (Category C syllabus)
    保护各把手在其应处的位置上，防止意外或过早开伞（C 单元教学大纲）
12. top to bottom, back to front (Category C syllabus)
    从上到下，从背面到前面（C 单元教学大纲）
13. Pull the cables to release the cloth loop. (closed parachute system briefing)
    拉动切伞拉索，释放白色固定绳。（已关包的降落伞系统的介绍）
14. information found on the reserve packing data card (closed parachute system briefing)
    可在备伞卡（备伞叠伞记录卡）上找到信息（已关包的降落伞系统的介绍）
15. rigger's packing seal on the reserve ripcord (closed parachute system briefing)
    降落伞装备师在备伞开伞拉索上的叠伞封铅（已关包的降落伞系统的介绍）
16. east (Category C syllabus)
    朝东（C 单元教学大纲）
17. Divide the exit weight by the square footage. (Instructor)
    将离机重量除以降落伞的面积（单位：平方英尺）（问教练）。
18. 170 square feet/170 pounds (Category C syllabus)
    170 平方英尺/170 磅（C 单元教学大纲）
19. when the jumper has control of all the variables and has executed a good flare at the appropriate altitude (Category C syllabus)
    当跳伞者能够掌控所有变化因素，并且在合适高度进行了良好的拉平（C 单元教学大纲）

CATEGORY D「D 单元」

1. 15 seconds (Category D outline)
   15 秒（D 单元大纲）
2. altitude, arch, legs, relax (Category D outline)
   高度，弓形，控腿，放松（D 单元大纲）
3. Look first in the direction of the turn. (Category D outline)

先朝打算转向的方向看。（D 单元大纲）

4. rear riser turn with the brakes still set (Category D outline)
   在刹车棒仍锁定的情况下使用后组提带转向（D 单元大纲）
5. use the rear risers (Category D outline)
   使用后组提带（D 单元大纲）
6. practice with rear-riser flares at altitude with that canopy during a routine jump (Category D outline)
   在平常跳伞时，在高空用这个降落伞的后组提带练习拉平（D 单元大纲）
7. Disconnect the RSL (if time), contact the building feet first, PLF, cut away after landing on top of a building, wait for competent help. (SIM Section 5-1.F)
   断开 RSL（如有时间），先用脚与建筑接触，PLF，降落在建筑顶部后切断主伞，等待专业帮助。（SIM 5-1.F）
8. to back up the jumper's emergency procedures (SIM Section 5-3.G)
   跳伞者的紧急程序的备份措施（SIM 5-3.G）
9. Check three-ring release system for correct assembly and RSL; three points of harness attachment for snap assembly or correct routing and adjustment; three operation handles— main activation, cutaway, reserve. (Category D outline)
   检查三环释放系统的装配和 RSL 是否正确；三个背带连接点的卡扣装配或正确的布线和调整；三个操作把手，即主伞把手，切伞把手，备伞把手。（D 单元大纲）
10. place head completely outside the aircraft and look straight down (Category D outline)
    将头部完全伸出机外，并向正下方看（D 单元大纲）
11. a. below 10,000 feet MSL? 2,000 feet;
        在海拔 10000 英尺以下：2000 英尺；
    b. 10,000 feet MSL and above? one mile
        在海拔 10000 英尺及以上：1 英里
    （FAR 105.17）
12. a. below 10,000 feet MSL? three miles
        在海拔 10000 英尺以下：3 英里
    b. 10000 feet MSL and above? five miles
        在海拔 10000 英尺及以上：5 英里
    （FAR 105.17）
13. jumper and pilot(FAR 105.17）
    跳伞者和飞行员（FAR 105.17）
14. All student jumps must be completed by sunset. (SIM Section 2-1.F.9)
    所有学生跳伞必须在日落前完成。（SIM 2-1.F.9）
15. Determine two lines from the horizon, one ahead and one abreast, and find the intersection of those two lines. (Category D outline)
    从地平线起，划两条虚拟线，一条从前方延伸过来，一条横向延伸过来，找到这两条线的交点。（D 单元大纲）
16. clouds and other aircraft (Category D outline)
    云和其他飞行器（D 单元大纲）

CATEGORY E「E 单元」

1. increases (Category E outline)
   下降速率增加（E 单元大纲）
2. reads unreliably (SIM 5-3.J.6.f)
   读数不可靠（SIM 5-3.J.6.f）
3. Smoothly raise the controls. (Category E outline)
   平稳地升起控制输入（即平稳地收回被下拉的刹车棒或组提带）。（E 单元大纲）

4. stable state of decreased glide and increased rate of descent (Category E outline)
   滑翔能力减弱，下降速度增加的稳定状态（E 单元大纲）
5. at the end of a flare when the jumper begins to rock back under the canopy (Category E outline)
   在拉平的末期，跳伞者开始在降落伞下往后荡（E 单元大纲）
6. full stall (Category E outline)
   完全失速（E 单元大纲）
7. Practice different rates of flare entry at different depths of flare (Category E outline)
   练习不同的进入拉平的速度和不同的拉平深度（E 单元大纲）
8. Stay well downwind of any obstacle, face into the wind early, disconnect the RSL, land with a PLF, pull one toggle down completely, and after landing, cut away if necessary (Category E outline)
   在任何障碍物的下风处足够远的地方降落，提前转向并迎风，断开 RSL，以 PLF 方式着陆，然后完全拉下一个刹车棒，必要时在着陆后切断主伞（E 单元大纲）
9. ten (Category E Open Canopy Orientation)
   10 条（E 单元“了解主伞展开后的降落伞”部分）
10. tail or trailing edge (Category E Open Canopy Orientation)
    降落伞的尾部或后缘（E 单元“了解主伞展开后的降落伞”部分）
11. C, D, and brakes(Category E Open Canopy Orientation)
    C 线、 D 线和刹车线（E 单元“了解主伞展开后的降落伞”部分）
12. top center (Category E Open Canopy Orientation)
    伞布顶部的中心（E 单元“了解主伞展开后的降落伞”部分）
13. FAA rigger, person jumping the parachute, person under rigger's supervision (FAR 105.43)
    联邦航空局认证的降落伞装备师，以及使用这个伞进行跳伞的人，还有在降落伞装备师监督下叠伞的人（FAR 105.43）
14. every 180 days (FAR 105.43)
    每 180 天（FAR 105.43）
15. pilot (FAR 91.3.A)
    飞行员（FAR 91.3.A）
16. to maintain the correct balance; protection in a crash (Category E Aircraft briefing)
    保持正确的平衡；以及坠机时的保护（E 单元“飞机简报”部分）
17. pilot (FAR 91.7.B)
    飞行员（FAR 91.7.B）
18. 14,000 feet (FAR 91.211.A.2)
    14000 英尺（FAR 91.211.A.2）
19. 15,000 feet (SIM 2-1.M; FAR 91.211.A.3)
    15000 英尺（SIM 2-1.M；FAR 91.211.A.3）
20. remain forward until it is time for their group to exit (Category E Aircraft Briefing)
    保持在机舱内靠前的位置，直到轮到自己出舱（E 单元“飞机简报”部分）
21. other canopies (Category E outline)
    其他降落伞（E 单元大纲）
22. see and remain clear of other jumpers. (Category E outline)
    观察并保持远离其他跳伞者。（E 单元大纲）
23. forms a separable link between the main riser and reserve ripcord so that cutting away the main activates the reserve, if the RSL is hooked up (SIM Section 5-3.F)
    在主伞组提带和备伞开伞拉索之间形成一个可分离的连接，在 RSL 连上的时候，切断主伞时备伞也会被激活（SIM 第 5-3.F 节）
24. The reserve deploys with the main still attached by the other riser. (SIM Section 5-3.F.)
    备伞释放时，主伞仍被另一个组提带连着。（SIM 第 5-3.F.节）

25. inspection and maintenance; correct packing, tight line stowage, and stable deployment, all to prevent hard openings (SIM Section 5-3.F)
检查和维护；正确的叠伞，紧密地绑好伞绳，稳定的开伞，以及所有可以防止开伞过猛的措施（SIM 第 5-3.F 节）
26. Any of the following:
下列任何一种
    a. Deploy the main parachute at the correct altitude to avoid AAD activation.
在正确的高度开主伞，以避免 AAD 被激活。
    b. Initiate malfunction procedures high enough to cut away safely and avoid AAD activation
在发生故障时，在足够高的高度启动应急处理程序，以安全切开主伞并避免 AAD 被激活
    c. Maintain and correctly operate hand-deployed pilot chutes, especially collapsibles.
维护并正确操作手动释放的引导伞，特别是可缩引导伞。
    d. Protect equipment before exit to prevent pins or handles from being knocked loose.
出舱前注意保护好降落伞装备，防止关包针或把手被弄松。
    e. Maneuver gently below the AAD's firing range (Category E outline)
开伞后，在 AAD 的激活高度范围内平缓地进行机动
（E 单元大纲）
27. a. Biplane「两个降落伞一前一后」
Release the brakes on the front canopy only and steer that canopy gently; PLF.
仅释放靠前的降落伞上的刹车棒，并平缓地控制这个降落伞；执行 PLF。
    b. Side by side「两个降落伞一左一右紧贴」
Disconnect the RSL if altitude permits. Leave the brakes stowed and steer by pulling on the rear risers. Land without flaring and perform a parachute landing fall.
如果高度足够的话，解开 RSL。不释放刹车棒，通过拉后组来控制方向。降落时不拉平，并执行 PLF。
    c. Downplane「主伞和备伞分处两边」
Release the RSL (if time) and cut away. (SIM 5-1.E)
解开 RSL（如果有时间）并切断主伞。（SIM 5-1.E）

CATEGORY F「F 单元」

1. braked turns (Category F outline)
带刹车的转向（F 单元大纲）
2. stalls (Category F outline)
失速（F 单元大纲）
3. Flaring from half brakes requires a quicker stroke, the stroke is shorter, and stalls occur sooner. (Category F outline)
从半刹车位置开始拉平，需要更快地拉刹车，刹车行程更短，失速发生得更快。（F 单元大纲）
4. slows descent, changes glide (Category F outline)
减缓下降速度，改变滑翔状态（F 单元大纲）
5. The angle at which the parachute descends towards its projected landing point (Category F outline)
降落伞下降到预定着陆点的角度。（F 单元大纲）
6. Look ahead to find the point on the ground that appears not to rise or sink. (Category F outline)
向前看，找到地面上看起来既不上升也不下降的点。（F 单元大纲）
7. The glide path will become steeper as the wind decreases when flying with the wind. The glide path will become steeper as the wind speed increases when flying into the wind. (Category F outline)
当顺风时，随着风速的减小，滑翔航迹会变陡。当逆风，随着风速的增加，滑翔航迹将变得更加陡峭。（F 单元大纲）
8. Dip one shoulder slightly in the direction of the turn. (Category F outline)

将一个肩膀稍微向转向方向倾斜。（F 单元大纲）

9. to avoid other groups ahead and behind (Category F outline)
   避开前面和后面的其他团体（F 单元大纲）
10. 40 knots (pre-flight planning)
    40 节（飞行前计划）
11. gauge separation according to position over the ground (SIM Section 5-7)
    根据相对应的地面位置进行估计分离量，确定出舱间隔（SIM 第 5-7 节）
12. lines straight and in place in the center, slider up, tight line stows (Category F outline)
    伞绳是绷直的并在中间位置，滑块布在上面（起始位置），伞绳紧紧地用皮筋绑好（F 单元大纲）
13. clear path from snap shackle to guide ring (Category F outline)
    RSL 卡扣到引导环之间走线清晰（F 单元大纲）
14. What is the make and model of parachute system you are jumping?
    你要跳的降落伞系统是什么牌子和型号的？
    a. Main canopy?「主伞」
    b. Harness and container system?「背带和伞包系统」
    c. Automatic activation device? 「自动激活装置（AAD）」
    (equipment data) (Instructor)
    （找装备数据）（问教练）
15. 3,000 feet (SIM 2-1.H)
    3000 英尺（SIM 2-1.H）
16. 14 mph (SIM 2-1.G)
17. a. 1/2 mile
        1/2 英里
    b. east
        东
    （F 单元大纲）
18. Avoid the area early during the descent, minimum braked turn necessary to avoid lines, land parallel to the wires, braked landing, prepare for PLF, try to touch only one line at a time, wait for help and confirmation that the power has been turned off and will remain off until recovery operations are complete. (SIM 5-1.F)
    在下降过程中提前避开该区域，执行为避开电线所需的最小刹车转向，平行于电线着陆，带刹车着陆，准备 PLF，尽量尝试一次只接触一条电线，等待帮助并等待确认电力已关闭，并将保持关闭状态，直到救援操作完成。（SIM 5-1.F）
19. jumpmaster, or spotter (Category F outline)
    跳伞指导（Jumpmaster）或者负责看点定位的人（F 单元大纲）
20. DZ policy (Instructor)
    跳伞基地政策（问教练）
21. school policy (Instructor or pilot)
    学校政策（问教练或飞行员）
22. 25（SIM 3-1.E，A 执照）
23. jump without supervision, pack his or her own main parachute, engage in basic group jumps, and perform water jumps (SIM 3-1.E, A license)
    在没有监督的情况下跳伞，自己叠主降落伞，进行基本团体跳伞，进行水上跳伞（SIM 3-1.E，执照）
24. make at least one jump under the supervision of a USPA instructional rating holder (SIM Section 5-2, Currency Training)
    在 USPA 教学评级持有者的监督下至少跳一次（SIM 5-2，复训）

25. make at least one jump beginning in Category D with a USPA AFF Instructor or in Category B with a USPA IAD Static-Line, or Tandem Instructor before proceeding to unsupervised freefall (SIM Section 5-2, Currency Training)
在进行无监督的自由落体前，至少与 USPA AFF 教练按 D 单元要求跳一次，或与 USPA IAD、Static Line 教练或双人伞教练按 B 单元要求跳一次（SIM 5-2，复训）

CATEGORY G「G 单元」

1. legs (Category G outline)
腿部控制（G 单元大纲）
2. 1500 feet above planned deployment altitude (SIM Section 6-1.C)
高于计划开伞高度 1500 英尺（SIM 6-1.C 节）
3. line twist (Category G outline)
线缠绕（G 单元大纲）
4. dives (Category G outline)
俯冲（G 单元大纲）
5. line twist, collision with jumpers, collision with the ground (Category G outline)
线缠绕，与其他跳伞者碰撞，与地面碰撞（G 单元大纲）
6. check altitude, establish communication (SIM 5-1.H)
检查高度，保持和另一位跳伞者沟通（SIM 5-1.H）
7. bridle routing and placement (packing lesson)
引导伞系带的走线和安置（叠伞课程）
8. unnecessary wear on the three-ring release webbing and loops (Category G outline)
导致三环释放系统的织带和环上不必要的磨损（G 单元大纲）
9. covers the hook velcro, which can damage other components, prevents tangles (Category G outline)
盖住魔术贴，防止缠结和损坏其他部件（G 单元大纲）
10. FAA rigger (FAR 65.125.a.1)
联邦航空局认证的降落伞装备师（FAR 65.125.a.1）
11. Ultraviolet rays degrade nylon. (Category G outline)
紫外线降解尼龙材料（G 单元大纲）
12. shorter life for AAD batteries, stow band degradation (Category G outline)
AAD 电池寿命较短，绑伞绳的皮筋性能退化（G 单元大纲）
13. loses tackiness (Category G outline)
粘性降低（G 单元大纲）
14. distortion (Category G outline)
变形（G 单元大纲）
15. FAA (rigger briefing)
联邦航空局（降落伞装备师简报）
16. collision with formation, funnel (Category G outline)
与编队碰撞，漏斗效应（G 单元大纲）
17. AAD activation near the open door of an aircraft presents a dangerous situation. (Category G outline)
在打开的机舱门附近，AAD 如果被激活，会导致危险。（G 单元大纲）
18. possibility of AAD activation or other accidental or unplanned pack opening (Category G outline)
因为存在 AAD 激活或其他意外或计划外伞包打开的可能性（G 单元大纲）
19. to improve their chances for correct operation, to help prevent premature AAD activations, to comply with the law (Category G outline)
提高它们正常运行的可能性，有助于防止过早激活 AAD，并有助于遵守相关法规（G 单元大纲）
20. Deploy the reserve (may not be a safe option with an SOS system). (SIM Section 5-1.H)

开备伞（对于单把手紧急系统（SOS）来说可能不是一个安全的选项）（SIM 5-1.H）

21. Face into the wind, prepare for PLF, flare to half brakes, protect face and under arms, wait for help. (SIM 5-1.F)
迎风前进，准备 PLF，拉平到半刹车位置，用手保护面部，等待帮助。（SIM 5-1.F）
22. thunderstorms in the area (SIM Section 5-5)
区域内有雷暴（SIM 5-5）
23. thunderstorms in the gust front; rapid and significant changes in winds (SIM Section 5-5)
阵风锋面的雷暴；风况的急剧变化（SIM 5-5）
24. each will increase (SIM Section 5-5)
都会增加（SIM 5-5）

CATEGORY H「H 单元」

1. to see others and avoid a collision (Category H outline)
观察他人并避免碰撞（H 单元大纲）
2. slow fall position with arms forward and knees down (Category H outline)
采取低下降速率的姿势，手臂伸前，膝盖向下（H 单元大纲）
3. premature deployment (Category H outline)
意外过早开伞（H 单元大纲）
4. Sludge-like dirt and oil deposits cause them to bind. (Category H outline)
像污泥一样的污渍和油渍会使它们粘合在一起。（H 单元大纲）
5. Neutralize the turn and get the canopy overhead. (SIM Section 5-1.I)
停止转弯，让降落伞伞布处于头顶。（SIM 5-1.I）
6. dramatic increase in rate of descent (jump experience)
下降速度急剧增加（跳伞经验）
7. Keep them in your hands. (Category H outline)
保持刹车棒握在手里。（H 单元大纲）
8. collisions with other jumpers, collision with the ground (Category H outline)
与其他跳伞者碰撞，以及与地面碰撞（H 单元大纲）
9. serious injury or death (SIM Section 5-1.I)
重伤或死亡（SIM 5-1.I）
10. Inflate flotation device, disconnect chest strap and RSL, prepare for PLF, face into wind, flare, hold breath, cut away once feet are wet, remove leg straps, swim upwind; if under the canopy, dive deep and swim away or follow one seam until out from underneath. (SIM Section 5-1.F）
给漂浮装置充气，解开胸带和 RSL，准备 PLF，迎风，拉平，屏气，脚触水后切断主伞，脱下腿带，逆风游泳；如果位于伞下面，则潜水并游泳离开，或沿着伞缝游动，直到从伞下面出来。（SIM 5-1.F）
11. ten percent (Category H outline)
10%（H 单元大纲）
12. no (FAR 105.13.a.1)
不合法（FAR 105.13.a.1）
13. one hour (FAR 105.25.a.3)
至少提前 1 小时（FAR 105.25.a.3）
14. AC 105.2, Appendix 2, or aircraft owner's manual (Category H outline)
参考 AC 105.2 附录 2，或飞机所有者手册（H 单元大纲）
15. person giving notice (FAR 105.15.a.6)
发出通知的人（FAR 105.15.a.6）

附录 C：USPA 执照学习指南
USPA License Study Guide

A. EXAM STUDY INSTRUCTIONS「考试学习指南」

1. Use this guide to find the correct areas of the Skydiver's Information Manual to study for USPA license written exams.
   这个指南告诉你本手册中 USPA 执照笔试内容的对应区域。
2. Study guide information for the USPA A license exam is listed in the "Book Stuff" at the beginning of each Category of the Integrated Student Program in SIM Section 4.
   USPA A 执照考试的学习指南信息列在本手册第四章"综合学生计划"各单元开头的"参考资料"中。
3. Look in SIM Section 3 for more information on licenses and all license exams.
   有关执照和所有执照考试的详细信息，请参阅 SIM 第三章。
4. Refer to the USPA B, C, and D license application and written exam answer sheet available online at uspa.org/downloads.
   USPA B、C 和 D 执照申请信息和笔试答题纸可在 uspa.org/downloads 获得。

B. PASSAGES TO STUDY「学习路径」

A LICENSE「A 执照」
SIM 章节：
2-1（全部）
4 所有单元
5-1
5-2
6-2
6-8
9, FAR 105

B LICENSE「B 执照」
SIM 章节：
2-1（全部）
4 D 单元
4 F 单元
4 G 单元
4 H 单元
5-1
5-2
5-3
6-2
6-4
6-6
9-1 FAR 91.17
9-1 FAR 91.211
9-1 FAR 119.1

C LICENSE「C 执照」
SIM 章节：
2-1（全部）
4 C 单元
5-1
5-2
5-6
6-2
6-7
6-8
6-9
6-10
7-1
9-1 FAR 91.15
9-1 FAR 91.151
9-1 FAR 91.409
9-1 FAR 105.17

D LICENSE「D 执照」
SIM 章节：
2-1
4 F 单元
4 G 单元
4 H 单元
5-1
5-2
5-3
5-4
5-5
5-6
6-1
6-2
6-4
6-6
6-7
6-8
6-9
6-10
7-1
9-1 FAR 91.151
9-1 FAR 91.211
9-1 FAR 105.17
9-1 FAR 105.43

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