



民用航空应用型人才培养特色教材



PEPEC民航飞行员 综合英语

高培新 主 编
邢琳琳 韩佳佳 马倩倩 副主编



北京航空航天大学出版社
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内 容 简 介

本书对中国民用航空局(CAAC)组织的中国民航飞行人员英语等级考试(PEPEC)内容进行了梳理,同时整合了国内外航空英语教学的核心内容,主要涵盖两部分内容,共包括12章。

第一部分主要讲述飞行员专业英语理论知识,共6章,主要内容有中国航空简史、航空器分类、中国民航现状、飞行原理、空气动力学、飞机系统、机场、跑道、航空安全及现代飞机机型等基础知识。

第二部分主要讲述无线电英语陆空通话理论知识及航空案例解读,共6章,主要内容有数字、字母、无线电检查、通播、管制单位、基本飞行程序、航空特情分析、航空案例解读及模拟陆空通话等。

本书结构严谨、条理清晰、实用性强,既整合了PEPEC考试的相关考核内容,又融入了作者多年的教学经验与研究成果,反映了当前航空英语教学的前沿。本书可为航空类院校飞行技术专业及相关专业学员提供有效的学习参考,也可推动国内航空英语教学新一轮改革。

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序

近年来,我国民航事业迅速发展,这对专业人才培养质量提出了更高的要求。无论从政治素质、规章意识、责任意识,还是从专业知识、专业素质、技术能力等多个方面,均需要更高的培养标准。反观目前我国民航专业教材,普遍存在着知识相对陈旧,体系架构不甚合理,呈现形式较为单一,适应性和针对性不强,国际化和开放性偏低等问题,难以适应我国民航业快速发展的实际情况,从而影响了从业人员的培养质量,已成为阻碍我国民航业快速发展的不利因素。

滨州学院飞行学院是经教育部、民航局批准的以本科教育为主体的二级学院,2006年,在全国地方普通高校中率先设置了飞行技术本科专业,目前设有飞行技术、飞行安全、民航机务工程、空中交通管理与签派、机场运行与管理5个专业方向。学院始终坚持“服务民航,就业民航”的办学方针,依托国家级专业综合改革试点项目、国家级大学生校外实践教育基地建设项目、山东省高等学校特色专业建设项目、卓越工程师培养计划以及高等学校人才培养模式创新实验区建设项目,依靠航空工程重点学科建设以及承担的国家级、省部级教科研项目等,全力打造具有民航特色的教学体系,大力培养民航发展所需要的高层次专业技术人才。

在多年教学实践、探索与总结的基础上,为适应我国民航对专业人才的需求,及时反映最新的研究与实践成果,更好地服务于民航专业人才培养,我们组织编写了“民用航空应用型人才培养特色教材”丛书。该丛书注重“专业建设融合行业标准,学历教育对接岗位技能”,突出民航业的标准性、规范性、国际性以及民航专业人才的高素质、严要求、强技能;注重对专业建设多年来的探索与实践,汲取专业教师的实际教学经验、成果和大量学生的反馈意见;注重密切关注民航技术的新发展、新变化,充分借鉴和吸收国内外的研究资料和成果;

注重知识的基础性、系统性和全面性，内容充实，覆盖面广，力求充分反映当前民航业的实际，满足多层次读者的学习需求。

人才培养是民航事业的重要组成部分，也必将随着民航事业的发展而发展。与人才培养密切相关的教材编撰只有不断适应新技术、新要求，着眼当下，放眼未来，才能真正服务于民航专业的人才培养。该丛书的编写正是在民航专业人才培养教材建设方面的尝试和探索，力图推广专业教学经验和教学成果，促进民航专业的教学改革，提高民航专业人才的培养质量，以更好地服务于我国民航事业的发展。

编委会

2015年8月

前 言

本教材可为航空院校飞行技术专业及航空类相关专业学员提供专业与系统的航空理论知识,也可为相关人员通过中国民用航空局(CAAC)组织的中国民航飞行人员英语等级考试(PEPEC)提供系统完善的学习素材。该教材在提供丰富的航空英语知识与无线电陆空通话知识的同时,可有效提升学习者的航空英语综合应用能力,极大地提高学习者的理论水平,为飞行训练及飞行操纵提供良好的理论支撑。作者在编写本书过程中,既注重国际民航组织(ICAO)对民航从业人员的英语要求,也强调PEPEC考试对中国民航飞行人员语言与理论知识的要求,并力图将两者整合,真正实现了对国内外教学资源的有效整合。

该书共包括12章,主要涵盖两部分内容:飞行员专业英语与飞行员英语陆空通话。飞行员专业英语部分共6章,主要内容涉及中国航空简史、航空器分类、空气动力学、飞机系统、机场及航空安全等知识。飞行员英语陆空通话部分共6章,主要内容既涉及正常情况下的无线电陆空通话,也包括非正常情况下的无线电陆空通话,同时该部分还引入了航空案例解读,并将航空案例与无线电陆空通话内容进行有效衔接,增强了无线电陆空通话学习的实用性。

通过对本教材的学习,学员既能掌握基础航空理论知识,又能为飞行训练奠定良好的无线电陆空通话基础。在学习过程中,学员需达到以下要求:熟悉航空历史与航空器分类;掌握飞行器结构与飞行原理;明确飞机系统的分类与功能;了解基本陆空通话程序;熟知无线电陆空通话的表达技巧;理解航空案例与非正常情况下的陆空通话。

尽管本教材不能涵盖PEPEC考试的全部内容,但已涵盖PEPEC考试的核心内容,可为准备PEPEC考试的学习者提供良好的理论支撑;同时,作者将多年的教学内容进行有效梳理并将重要知识点融合到教材编写中,这些内容的补充与完善可为航空院校飞行技术专业及相关专业的航空英语教学提供前沿资料,推动航空院校的教学改革。

鉴于编者水平所限，书中难免存在错误与不足之处，希望读者能在教材使用过程中提供宝贵意见，编者在此致以诚挚的谢意。

最后，真心感谢在教材编写过程中提供无私帮助的领导、同事、朋友、学生及家人，特别感谢滨州学院飞行学院胡波院长对教材编写工作的指导及邢琳琳老师对教材内容的审定与编排。

编 者

2015年9月1日

Preface

The PEPEC Comprehensive English for Civil Pilots provides the professional and essential knowledge for civil pilots. It introduces the civil pilots to the broad spectrum of aviation knowledge and radiotelephony communication skills, which are greatly needed in the process of flight theory study and flight training. It represents an extended and thoroughly revised version of collection on flight theories and other concerning topics, of which are the basic knowledge required by International Civil Aviation Organization (ICAO). More importantly, it covers the basic knowledge required by the PEPEC (Pilot English Proficiency Examination of China) examination held by Civil Aviation Administration of China (CAAC).

According to the PEPEC requirements, this book mainly focuses on two parts: aviation theory and radio communication. The first part mainly covers six chapters, including access to civil aviation, aircraft and aerodynamics, aircraft systems, terminal issues, aviation safety and modern aircraft. The second part mainly covers six chapters as well, including numbers, letters, call signs, radio communication on normal flight, abnormal flight on operational failure, unexpected events, adverse weather and system malfunction. Particularly, air accidents interpretations are introduced. Meanwhile, it intends to explore the basic information of aeronautical knowledge of flight and form a solid foundation for the civil pilots' radio communication skills. It requires the civil pilots to master the following key items: get familiar with the aviation history and classification of aircraft; master the aircraft structure and principles of flight; classify the flight systems and remember the working functions; grasp the normal flight procedures; acquire the skills for radio communication both in normal flight and abnormal flight; ensure the security factors by analyzing the accidents.

Although the book does not cover all the aspects related to theory study and flight training, it really contains the main parts concerning about flight. Not only does it help the civil pilots acquire the basic knowledge of flight, but also it improves the civil pilots' comprehensive English capability. More critically, it can assist the civil pilots to pass the PEPEC examination and help them become qualified civil pilots under the leadership of CAAC. Due to the knowledge limitation of the writers, errors may occur in the preparation of this book. Corrections and suggestions are always appreciated.

Finally, hearty thanks to my family, leaders, colleagues, friends and students who have offered me constant support and help. Particularly, special thanks to my parents, my wife and my daughter who have given me selfless and continuous assistance.

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Chapter One

Access to Civil Aviation

1.1 Aviation History

Aviation is the practical aspect or art of aeronautics, being the design, development, production, operation and use of aircraft, especially heavier-than-air aircraft. The word “aviation” was coined by French writer and former naval officer Gabriel La Landelle in 1873, from the verb “avier” (derived from the Latin word “avis”, originally similar to the meaning of “bird”) and the suffix “-ation”.

The history of aviation has extended more than two thousand years from the earliest kites and attempts at tower jumping to supersonic, and hypersonic flight by powered, heavier-than-air jets. The aviation history can be generally divided into two periods according to the developing phases: lighter-than-air period and heavier-than-air period.

1.1.1 Lighter-than-air Period

The modern age of aviation began with the first untethered human lighter-than-air flight on November 21, 1783 of a hot air balloon designed by the Montgolfier brothers. The practicality of balloons was limited because they could only travel downwind. It was immediately recognized that a steerable or dirigible balloon was required. Jean Pierre Blanchard flew the first human-powered dirigible in 1784 and crossed the English Channel in 1785.

Rigid airships became the first aircraft to transport passengers and cargo over great distances. The best known aircraft of this type were manufactured by the German Zeppelin Company.

The most successful Zeppelin was the Graf Zeppelin. It flew over one million miles, including an around-the-world flight in August 1929. However, the dominance of the Zeppelins over the airplanes of that period, which had a range of only a few hundred miles, was diminishing as airplane design advanced. The “Golden Age” of the airships



Picture 1.1
Jean Pierre Blanchard



Picture 1.2
Zeppelin Airship

ended on May 6, 1937 when the Hindenburg caught fire, killing 36 people. The cause of the Hindenburg accident was initially blamed on the use of hydrogen instead of helium as the lift gas. An internal investigation by the manufacturer revealed the coating used to protect the covering material over the frame was highly flammable and allowed static electricity to build up in the airship. Changes to the coating formulation reduced the risk of further Hindenburg type accidents. Although there have been periodic initiatives to revive their use, airships only experienced limited applications since that time.

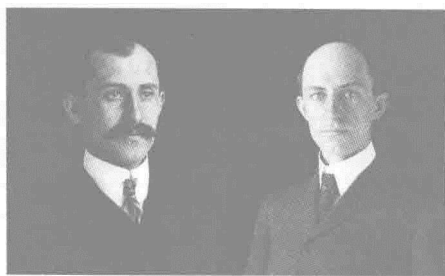
1.1.2 Heavier-than-air Period

In 1799 Sir George Cayley set forth the concept of the modern airplane as a fixed-wing flying machine with separate systems for lift, propulsion, and control. Early dirigible developments included machine-powered propulsion, rigid frames and improved speed and maneuverability.

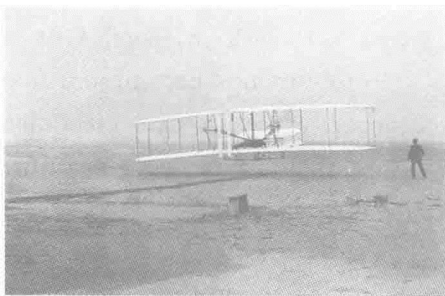
There are many competing claims for the earliest powered, heavier-than-air flight. The first recorded powered flight was carried out by Clement Ader on October 9, 1890 when he reportedly made the first manned, powered, heavier-than-air flight of a significant distance but insignificant altitude from level ground in his bat-winged, fully self-propelled fixed-wing aircraft.

However, the most widely accepted date is December 17, 1903 by the Wright brothers. The Wright brothers were the first to fly in a powered and controlled aircraft. Previous flights were gliders or free flight, but the Wright brothers combined both, setting the new standard in aviation records. Following this, the widespread adoption of ailerons rather than wing warping made aircraft much easier to control, and only a decade later, at the start of World War I, heavier-than-air powered aircraft had become practical for reconnaissance, artillery spotting, and even attacks against ground positions.

Aircraft began to transport people and cargo as designs grew larger and more reliable. The Wright brothers took aloft the first passenger, Charles Furnas, one of their mechanics, on May 14, 1908.



Picture 1.3 The Wright Brothers



Picture 1.4 First Flight of the Wright Flyer I, December 17, 1903