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SECRETARY OF THE AIR FORCE**



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***AEROSPACE PHYSIOLOGY TRAINING
PROGRAM***

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This manual implements Air Force Policy Directive (AFPD) 11-4, *Aviation Service*; AFPD 11-2, *Aircrew Operations*; Air Force Interoperability Council (AFIC) Air Standard Aerospace Medicine (ASM) 3003 Edition 1, version 4, *Aviation Medicine/Physiology Training of Aircrew*; AFIC Air Standard ASM 3010, *Aviation Medicine/Physiological Training of High Altitude Parachutists*, and AFIC Information Publication ASM 3009 Edition 1, version 3, *Spatial Disorientation*; Department of the Air Force Policy Directive (DAFPD) 10-9, *Lead Command/Lead Agent Designation and Responsibilities for United States Air Force Weapon Systems, Non-Weapon Systems, and Activities*; DoD 7000.14-R, *Department of Defense Financial Management Regulation*. This manual is consistent with the North Atlantic Treaty Organization (NATO) Standardization Agreement (STANAG) 3114, *Aeromedical Training of Flight Personnel*; NATO STANAG 3474, *Temporary Flying Restrictions Due to Exogenous Factors Affecting Aircrew Efficiency* (<https://nso.nato.int/nso/nsdd/ListPromulg.html>). This publication applies to all civilian employees and uniformed members of the Regular Air Force, the Air Force Reserve, the Air

National Guard, the Civil Air Patrol when conducting missions as the official Air Force Auxiliary, and those who are contractually obligated to comply with Department of the Air Force (DAF) publications. This manual does not apply to the United States Space Force. This manual requires the collection and/or maintenance of information protected by the Privacy Act of 1974 authorized by System of Records Notice DoD 0005, *Defense Training Records* available at: <http://dpclo.defense.gov/Privacy/SORNs.aspx>. Ensure all records generated as a result of processes prescribed in this publication adhere to AFI 33-322, *Records Management and Information Governance Program*, and are disposed in accordance with the Air Force Records Disposition Schedule, which is located in the Air Force Records Information Management System. Refer recommended changes and questions about this publication to the office of primary responsibility (OPR) using the DAF Form 847, *Recommendation for Change of Publication*; route DAF Forms 847 from the field through the appropriate functional chain of command. This publication may be supplemented at any level, but all supplements must be routed to the OPR of this publication for coordination prior to certification and approval. The authorities to waive wing, unit, or garrison level requirements in this publication are identified with a Tier (“T-0, T-1, T-2, T-3”) number following the compliance statement. Submit requests for waivers through the chain of command to the appropriate Tier waiver approval authority, or alternatively, to the publication OPR for non-tiered compliance items. See Department of the Air Force Manual (DAFMAN) 90-161, *Publishing Processes and Procedures*, for a description of the authorities associated with the Tier numbers. The use of the name or mark of any specific manufacturer, commercial product, commodity, or service in this publication does not imply endorsement by the Department of the Air Force.

(ACC) AFMAN 11-403, *Aerospace Physiological Training Program*, is supplemented as follows: This supplement applies to all Air Combat Command (ACC) aircrew and parachutists participating in aerospace physiology initial and refresher training in accordance with (IAW) AFMAN 11-403 and to those Air National Guard and Air Force Reserve Command members trained at an ACC Aerospace Physiology Training Unit (APTU). This publication may be supplemented, but all direct supplements must be routed to the office of OPR of this publication for coordination prior to certification and approval. Refer recommended changes and questions about this publication to the OPR using the DAF Form 847, *Recommendation for Change of Publication*; route DAF Forms 847 from the field through the appropriate functional chain of command. Submit requests for waivers through the chain of command to the Publication OPR for non-tiered compliance items. Ensure all records created as a result of processes prescribed in this publication are maintained IAW AFI 33-322, *Records Management and Information Governance Program*, and disposed of in accordance with the Air Force records information management system records disposition schedule. The use of the name or mark of any specific manufacturer, commercial product, commodity, or service in this publication does not imply endorsement by the Air Force.

SUMMARY OF CHANGES

This document has been substantially revised and needs to be completely reviewed. This change revises Air Force Manual (AFMAN) 11-403 by (1) updating the title, (2) incorporating the entirety of Air Force Guidance Memorandum (AFGM) 2023-01 (27 April 2023), (3) updating obsolete 43AX and 4M0X1 Air Force Specialty Codes (AFSC) to 13HX and 1H0X1 per Program Action

Directive 20-02, *Aerospace Physiology Enterprise Transition*, Item D-001, (4) accepting US Navy refresher training for Air Force aircrew, (5) revising altitude chamber exposure restrictions after consults with the Wilford Hall Aerospace Neurology and Neuroimaging Research Director and the Brooke Army Medical Center Undersea and Hyperbaric Medicine Consultant, (6) revising altitude chamber student-to-instructor ratios (7) replacing the AF Form 1274, *Physiological Training* with the AF Form 1522, *ARMS Additional Training Accomplishment Report* (8) clarifying requirements for instructor currency and qualification, and (9) specifying an English-language requirement for nations requesting program certification.

(ACC) This document is substantially revised and must be completely reviewed. This supplement aligns specific ACC Aerospace Physiology training requirements with the parent AFMAN.

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Chapter 1

INTRODUCTION

1.1. Purpose.

1.1.1. This publication prescribes the framework for unit Aerospace Physiology (AP) training programs and procedures and describes execution of the physiology program specific to aircrew training.

1.1.2. This publication addresses the mission of each unit AP training function, and identifies the key processes, tasks and procedures required of the unit to accomplish its mission. Major Commands (MAJCOM) will determine the applicability of these publications for mission sets not otherwise specifically addressed by published guidance.

1.1.3. MAJCOMs, direct reporting units, and field operating agencies will coordinate supplements to this manual with the Headquarters Air Force (HAF), Air Force Aircrew Performance Division (AF/A3TH) before and after publication. **(T-1)**

1.2. Standard Terminology Defined.

1.2.1. Compliance statements (i.e., those containing “will” or “must”) are used in accordance with (IAW) DAFMAN 90-161, *Publishing Processes and Procedures*, paragraph 4.6.5.1..

1.2.2. Aerospace Physiology Training Unit (APTU) refers to either an Aerospace Physiology Training Flight (APTF) or Aerospace Physiology Training Team (APTT).

1.2.3. The AP Enterprise includes the total complement of aerospace physiologist (13HX) and aerospace physiology (1H0X1) personnel.

1.2.4. 19th Air Force Operations, Aircrew Performance Branch/Aerospace Physiology Lead Command (19 AF/A3OA) will be referred to as “AP Lead Command” for the remainder of this publication.

1.3. Waiver Authority.

1.3.1. Unless otherwise specified, the Director of Training and Readiness, Deputy Chief of Staff of Operations (AF/A3T) is the waiver authority for guidance in this instruction.

1.3.2. Submit informational copies of all approved waivers to the Director of Training and Readiness, Deputy Chief of Staff of Operations (AF/A3T), Aircrew Performance Division (AF/A3TH) and AP Lead Command.

1.3.3. Waiver authority for supplemental guidance will be as specified in the supplement and approved through higher level coordination authority.

Chapter 2

ROLES AND RESPONSIBILITIES

2.1. Headquarters Air Force.

2.1.1. Director of Training and Readiness, Deputy Chief of Staff of Operations (AF/A3T).

2.1.1.1. Provides guidance and policy for aircrew training IAW AFMAN 11-202, Volume 1, *Aircrew Training*.

2.1.1.2. Provides fiscal advocacy to AF Personnel and Training Panel for Planning, Programming and Budgeting requirements to support the AP training program.

2.1.1.3. Resolves conflicts in MAJCOM guidance.

2.1.1.4. Designates a Chief, Aircrew Performance Division, and respective Air Force Career Field Managers 13HX and 1H0X1.

2.1.1.5. Manages the Air Force Outstanding AP Enterprise Awards Program.

2.1.1.5.1. The purpose of the Outstanding AP Enterprise Awards Program is to recognize Airmen and units for outstanding performance in duty, exceptional contributions to operations and management, and enhancements to readiness. The categories in **Table 2.1** apply to all 13HX and 1H0X1 personnel.

Table 2.1. Outstanding AP Award Program, Award Categories.

Outstanding USAF Aerospace Physiology Technician, Instructor of the Year
Outstanding USAF Aerospace Physiology Technician, Airman of the Year
Outstanding USAF Aerospace Physiology Technician, Noncommissioned Officer of the Year
Outstanding USAF Aerospace Physiology Technician, Senior Noncommissioned Officer of the Year
Outstanding USAF Aerospace Physiologist, Company Grade Officer of the Year
Outstanding USAF Aerospace Physiologist, Field Grade Officer of the Year
Outstanding USAF Aerospace Physiology, Training Flight of the Year
Outstanding USAF Aerospace Physiology, Training Team of the Year
Outstanding USAF Aerospace Physiology, Director's Award

2.1.1.5.2. The Outstanding AP Enterprise Awards Program is administered by AF/A3T, who will approve and announce final selection of award winners.

2.1.1.5.3. Units submit nominations via electronic mail to respective MAJCOMs no later than the suspense dates set by each MAJCOM. Each MAJCOM may submit one nomination per category.

2.1.1.5.4. Once MAJCOM winners have been selected, nominees for the DAF level awards will follow the same procedures as stated in the above paragraph, by submitting nominees to AF/A3TH.

2.1.2. Aircrew Performance Division (AF/A3TH).

2.1.2.1. Coordinates with Air Force Career Field Managers (AFCFMs) 13HX and 1H0X1 on AP Enterprise program/publication policy and guidance updates and changes.

- 2.1.2.2. Reviews MAJCOM supplements to this AFMAN to ensure MAJCOMs comply with guidance in this manual.
 - 2.1.2.3. Acts as liaison between Air Staff organizations and MAJCOMs.
 - 2.1.2.4. Coordinates with Air Staff organizations and MAJCOM Standardization and Evaluation (Stan/Eval) functions to ensure all subordinate guidance complies with policies contained in this manual and all other applicable guidance.
 - 2.1.2.5. Works with Program Managers (PMs) and MAJCOM Functional Managers (MFMs) to identify and support MAJCOM-specific program requirements.
 - 2.1.2.6. Coordinates on and processes applicable DAF Forms 847 through Operations Group channels (Numbered Air Force [if applicable] and MAJCOM). Air National Guard units will utilize the lead/gaining MAJCOM's process.
- 2.1.3. Chief, Aircrew Performance Division (AF/A3TH). Chairs the Aircrew Human Performance Working Group and leads a productive dialog on aircrew training and readiness among key stakeholders. This group will map a way forward to optimize USAF aircrew capability and capacity for sustained operations under increased physical/cognitive stress conditions in military aircraft. Specific responsibilities include:
- 2.1.3.1. Define the consolidated Line of Air Force strategy to align aircrew human performance across aircrew missions and career lifecycles, consistent with other human performance efforts taking place independently at the MAJCOM and unit level.
 - 2.1.3.2. Conduct a Joint Capabilities Integration and Development System (JCIDS) style capabilities analysis defining aircrew performance as a program of record.
 - 2.1.3.3. Recommend criteria and data collection systems/management to track aircrew performance readiness and program return on investment (ROI).
 - 2.1.3.4. Recommend investment priorities for individual aircrew communities.
 - 2.1.3.5. Provide budget recommendations to the appropriate panel for sustainment of human performance programs.
- 2.1.4. Air Force Career Field Managers (AFCFMs) 13HX and 1H0X1. Work with AF/A3T and Air Education and Training Command (AETC) to ensure program goals and directives are met.
- 2.1.4.1. Develop and maintain the currency of their respective Career Field Education and Training Plan (CFETP).
 - 2.1.4.2. Assist respective AFSC training manager with planning, developing, implementing, and maintaining all AFSC-specific training courses.
 - 2.1.4.3. Is the final waiver authority for their respective Air Force Officer Classification Directory (AFOCD) and Air Force Enlisted Classification Directory (AFECD) and training requirements.
 - 2.1.4.4. Assist AETC Studies and Analysis Squadron (AETC A9/SAS) in developing and administering respective Job Inventory Surveys and interpreting Occupational Survey Reports (OSR) data.

2.1.4.5. Develops, coordinates, and implements respective career field classification/structure changes.

2.1.4.6. In conjunction with the Air Force Personnel Center, deliberately assigns respective career field personnel to effectively conduct aircrew training and operate AP training devices.

2.1.4.7. Consults with Air Reserve Component on Reserve accession qualification and training.

2.1.4.8. Chair the Council of Aerospace Physiology Executives (CAPE).

2.1.4.9. AFCFM 1H0X1, assists AETC A9/SAS in identifying subject matter experts (SMEs) for Specialty Knowledge Test (SKT) revision projects and is a consultant on promotion test content and question validation inquiries.

2.1.5. Council of Aerospace Physiology Executives (CAPE). The CAPE is a AF/A3T sponsored steering group, mandated by this publication, responsible for providing overall direction for the AF's AP Enterprise. It is chartered to address the strategic planning and guiding force behind all 13HX and 1H0X1 activities. The CAPE provides enterprise requirements and direction to AF Operations (AF/A3).

2.1.6. The Air Force Chief of Safety (AF/SE). AF/SE, through the Air Force Safety Center (AFSEC), reviews, sanitizes, and provides annual mishap trend data to PM (13HX) or MFM (1H0X1) upon request. The AFSEC Office of the Judge Advocate (AFSEC/JA) reviews requests for safety animations and other mishap mitigation material via the Air Force Safety Automated System (AFSAS).

2.2. Headquarters Air Education and Training Command (AETC). AETC, as the Lead Command for the AP training program, sets policy and guidance in accordance with DAFPD 10-9, *Lead Command/Lead Agent Designation and Responsibilities for United States Air Force Weapons System, Non-Weapon Systems, and Activities*, and manages the AP training systems in accordance with AFI 16-1007, *Management of Air Force Operational Training Systems*. AETC has delegated this responsibility to 19th Air Force.

2.3. Headquarters 19th Air Force.

2.3.1. Programs and budgets for system-wide unique equipment acquisition, upgrades, and modifications to support the AP training device portfolio. The portfolio includes altitude chambers, reduced oxygen breathing devices (ROBDs), hypoxia familiarization trainers (HFTs), spatial disorientation trainers, and Barany Chairs.

2.3.2. Coordinates with the System Program Office (SPO) IAW DAFPD 10-9.

2.3.3. Coordinates with AF/A3T to recognize and accept non-USAF AP Training for members of other US military services and DoD agencies who fly on USAF aircraft.

2.3.4. Ensures consistency of requirements across the MAJCOMs.

2.3.5. Headquarters 19th Air Force, Aerospace Physiology Lead Command.

2.3.5.1. Coordinates with AF/A3TH on AP publication policy and guidance updates and changes.

2.3.5.2. Reviews MAJCOM supplements to this AFMAN to ensure MAJCOMs comply with guidance in this manual.

2.3.5.3. Acts as liaison between Air Staff organizations and MAJCOMs.

2.3.5.4. Coordinates with Air Staff organizations and MAJCOM Stan/Eval functions to ensure all subordinate guidance complies with policies contained in this manual and all other applicable guidance.

2.3.5.5. Coordinates with other organizations to incorporate mishap investigation and prevention information into AP courseware and training.

2.3.5.6. Develops and communicates AP syllabus and device objectives in coordination with AFCFMs 13HX and 1H0X1.

2.3.5.7. Works with PMs and MFMs to identify and support MAJCOM-specific program requirements.

2.3.5.8. Coordinates on and processes applicable DAF Forms 847 through Operations Group channels (Numbered Air Force [if applicable] and MAJCOM). Air National Guard units will utilize the lead/gaining MAJCOM's process.

2.3.5.9. Serves as the final authority on AP syllabus and device management in coordination with AFCFMs 13HX and 1H0X1.

2.3.5.9.1. Will report AP training device availability data to AF/A3TH no later than 31 January (annually).

2.3.5.9.2. Specific requirements will be detailed in an AF/A3TH tasking message.

2.4. Major Commands.

2.4.1. MAJCOM Operations (MAJCOM/A3).

2.4.1.1. Develop and manage applicable MAJCOM supplements to this manual as required.

2.4.1.2. Ensure appropriate utilization of 13HX and 1H0X1 manning to execute AP training program requirements in accordance with this publication.

2.4.2. Execute the AP training program in accordance with this publication and any applicable MAJCOM supplements.

2.4.3. Coordinate with MAJCOM staff and respective AFCFM to identify a 13HX and 1H0X1 to serve as the AP PM and MFM, respectively.

2.4.4. MAJCOM Chief of Safety (MAJCOM/SE). Will approve establishment of MAJCOM PM and MFM AFSAS accounts and provide MAJCOM Mission Design Series (MDS)-specific human factors and physiological event statistics and trends as requested.

2.4.5. MAJCOM Requirements Directorate (A5 or A8). Ensures all new MDS or Aircrew Flight Equipment (AFE) acquisitions, modifications, or upgrades are coordinated with AP Lead Command for review and potential incorporation into AP training. This review should include considerations of courseware and training systems to address MDS and/or AFE-specific physiology, human factors, and emergency procedures training requirements. Coordinates training changes with the SPO to acquire or modify existing AP training systems

to meet any unique requirements as a result of new MDS or AFE acquisitions, modifications, or upgrades. Programs for development of physiology training courseware specific to new, modified, or upgraded MDS or AFE systems during acquisition process.

2.4.6. MAJCOM AP PM and MFM. Conduct duties that include, but are not limited to, setting policy and establishing processes within their respective MAJCOMs.

2.4.6.1. Conduct an annual review of physiology training courseware, relevant to local primary MDS, to ensure training is in compliance with syllabi objectives.

2.4.6.2. Participate in realistic training review boards as required.

2.4.6.2.1. **(Added-ACC)** Participates in Ready Aircrew Program Tasking Message meetings as required.

2.4.6.3. Provide functional area compliance inspection guidance to subordinate organizations and MAJCOM staffs.

2.4.6.3.1. Establish procedures in MAJCOM supplements. Support MAJCOM staff assistance visits or inspections of units with APTUs as required.

2.4.6.3.2. Conduct continual evaluation to maintain program oversight and identify gaps or deficiencies in existing policy, guidance, training, and resources. Participate in continual evaluation processes by monitoring data from each wing (e.g. Management Internal Control Toolset (MICT), Self-Assessment Checklists, trend analysis, and any other existing functional processes) IAW DAFI 90-302, *The Inspection System Of The Department Of The Air Force*.

2.4.6.4. Coordinate supplements to this manual with HAF Aircrew Performance Division (AF/A3TH) and provide notification of published MAJCOM supplements.

2.4.6.4.1. **(Added-ACC)** ACC Training Support Squadron (TRSS) Aerospace Physiology Training Manager, in coordination with ACC AP PM/MFM, is responsible for maintaining and updating the ACC Supplement as required.

2.4.6.5. Track subordinate unit waiver requests and coordinate with lead commands to allow programmatic adjustments.

2.4.6.6. Convene conferences and working groups, as necessary, to review and improve command Stan/Eval policies and procedures.

2.4.6.7. Observe execution of unit missions and provide feedback when feasible.

2.4.6.8. Ensure appropriate utilization of 13HX and 1H0X1 manning to execute AP training program requirements in accordance with this publication.

2.4.6.8.1. PMs and MFMs will manage and conduct APTU evaluations in accordance with published guidance.

2.4.6.8.2. Ensure squadron programs, training documentation, certification, and qualification processes are standardized between all units in the same MAJCOM and between the groups of the same wing, when appropriate.

2.4.6.8.3. **(Added-ACC)** Will identify MDS specific AP Functional Area Managers (FAMs) within ACC and maintain an up-to-date listing of these appointed APs and

their associated MDS. This ACC AP FAM listing will be used as a reference throughout the AP career field for MDS specific issues and concerns as it relates to AP training and support.

2.5. Wing Commanders or Equivalent. Provide facilities and resources for executing the AP training program.

2.6. Operations Group Commanders or Equivalent with Aerospace Physiology Training Units.

2.6.1. Ensure all AP training, regularly available to local aircrew, is also available to off-station aircrew on a space available basis regardless of an aircrew member's owning MAJCOM, base assigned, or distance from the APTU.

2.6.2. Will budget for local training device sustainment for devices not managed by the AP SPO (e.g., gases/regulators, aircrew flight equipment, tools). **Note:** Spatial disorientation trainers and altitude chamber systems (altitude chamber, pumps, motors) are managed by the SPO.

2.6.2.1. Swing landing trainers and lateral drift trainers are real property and funded at the local level.

2.6.3. Distribute AP training funds to APTUs in a manner that maximizes AP training capabilities and AP personnel development.

2.6.4. Provide AP training personnel with appropriate security clearance/access to aircraft flight simulators and training facilities in accordance with AFMAN 11-202v1 and opportunities to fly in assigned aircraft as non-rated aircrew or on non-interference orders per DAFMAN 11-401, *Aviation Management*.

2.6.5. **(Added-ACC)** Ensure AP training is conducted in the most realistic training environment possible. When feasible, MDS specific simulators that can accommodate ROBDs with aircraft-specific oxygen systems should be used to improve training and emergency procedure realism.

2.6.6. **(Added-ACC)** Direct reoccurring Situational Emergency Procedures Training (SEPT) events that execute Dash-1 Emergency Procedures related to MDS specific oxygen systems. This SEPT event should be accomplished in the best or most realistic training device available and integrated into the current annual SEPT schedule.

2.6.7. **(Added-ACC)** Provide AP training personnel with appropriate MDS specific training opportunities to support the development of APs as the functional expert in local MDS oxygen systems, emergency procedures, physiological threats, and aircrew performance. Potential training opportunities include AP observation or auditing of basic qualification (B-course), Mission Qualification Training (MQT), or other aircrew training academic events that will increase AP operational knowledge and enable AP integration into direct MDS support roles.

2.7. Aerospace Physiology Training Units (APTU).

2.7.1. Execute AP training in accordance with this manual and any applicable MAJCOM supplements.

2.7.2. Establish and maintain a Flight Crew Information File (FCIF), relevant to AP operations associated with local primary MDS, consisting of current read file and publications library in

accordance with AFMAN 11-202, Volume 2, *Aircrew Standardization and Evaluation Program*. Review and sign-off prior to conducting AFMAN 11-403 training operations.

2.7.3. Maintain access to AFSAS for purposes of researching relevant physiologic events to support training content and mishap prevention.

2.7.3.1. Will secure AFSAS account access for all assigned AP Enterprise personnel.

2.7.3.2. Incorporate AF, MAJCOM, and MDS annual statistics, human factor trends, and physiology mishaps/events into AP training media.

2.7.3.3. Protect privileged safety information in accordance with DAFI 91-204, *Safety Investigations and Reports*, Chapter 4.

2.7.3.4. Coordinate with Wing/SE during any physiological event/Class E Mishap.

2.7.4. Implement Hazardous Duty Incentive Pay Program as it relates to altitude chamber inside observer duty IAW DoD 7000.14-R, *Department of Defense Financial Management Regulation*.

2.7.5. Develop emergency response plans in coordination with the local Chief of Aerospace Medicine (SGP) and base first responders to outline appropriate actions to be taken when students have adverse reactions to training.

2.7.6. Conduct and document emergency procedures training.

2.7.7. APTUs will establish Stan/Eval function in accordance with AF/A3TH published guidance.

2.7.8. **(Added-ACC)** APTUs at ACC Formal Training Unit (FTU) locations will serve as the AP hub unit for information pertaining to that specific MDS (e.g., Langley AFB – F-22 FTU, Davis-Monthan AFB – A-10 FTU, Seymour Johnson AFB – F-15E/EX FTU, Tinker AFB – E-3 FTU).

2.7.8.1. **(Added-ACC)** Members assigned to these AP hub units will integrate into the FTU they support and audit FTU classes applicable to AP support and training.

2.7.8.2. **(Added-ACC)** Each APTU located at an FTU location will identify an AP member to serve as the AP FAM for that specific MDS and coordinate this name with the ACC/PM IAW [paragraph 2.4.6.8.3](#). This AP FAM will ensure current weapon system specific information, as it pertains to physiological training and mishap prevention, is shared with AP units across the AF who support the same MDS (e.g., the F-15E/EX AP FAM at Seymour Johnson AFB will communicate emergency procedure changes, periodic trend analysis, CAF-wide physiological events and adjudication, MDS-specific courseware additions, and other relevant information with APs across the AF who support the F-15E/EX).

2.7.8.3. **(Added-ACC)** For MDS that ACC is not the FTU owning MAJCOM (e.g., F-16, F-35), ACC APs that support these MDS should work closely with the AP at the FTU location to ensure crossflow of current weapon system specific information as it pertains to physiological training and mishap prevention.

2.7.8.4. **(Added-ACC)** APTUs will develop and deliver SEPT events that execute Dash-1 Emergency Procedures related to the MDS specific oxygen systems they support. This

SEPT event should be accomplished in the best or most realistic training device available and integrated into the current annual SEPT schedule.

Chapter 3

PERSONNEL REQUIRING AEROSPACE PHYSIOLOGY TRAINING

3.1. Personnel Who Require Aerospace Physiology Training.

3.1.1. Aircrew. Aircrew (includes government civil service) will receive training IAW AFMAN 11-202, Volume 1 and applicable guidance in any AFIs/AFMANs 11-2MDS, Volume 1.

3.1.2. Parachutists. Parachutists will receive training IAW AFI 10-3503, *Personnel Parachute Program*.

3.1.3. Aerospace Physiology Enterprise personnel providing training in accordance with this manual will maintain AP training currency. **(T-2)**

3.1.4. Contracted aircrew and parachutists (including mission crew and flight test engineers) who are required by US Government contract to maintain AP training currency furnished by the US Government. **(T-0)**

3.1.4.1. Training must be scheduled by the contract government quality assurance evaluator or government flight representative after verifying the government's responsibility to provide physiology training to the contractor. **(T-0)**

3.1.4.2. A justification letter must be provided to the APTU as part of the documentation required to receive training. **(T-0)** Reference [Attachment 2, Figure A2.1](#) for an example of a justification letter.

3.1.5. United States Air Force Academy (USAFA) and Reserve Officer Training Corps (ROTC) cadets. Instructor or flight trainer cadets who require Aerospace Physiology Training supporting USAFA and AETC Airmanship programs or as required IAW DAFMAN 11-401. Cadets will receive standard initial training documented on an AF Form 1522 with an expiration date upon commissioning.

3.2. Other Personnel Requesting Training.

3.2.1. Deploying Personnel. Personnel may require AP training as part of a deployment tasking. This requirement will be identified in the Reporting Instructions. Unit Deployment Managers will schedule training with the APTU. **(T-3)**

3.2.2. Orientation flyers. AP personnel, or Flight Surgeons when AP personnel are not available, will provide a briefing on physiological symptoms, trapped gas areas, causes and mitigation, airsickness prevention, and acceleration forces (if applicable) within 72 hours of flight. If 72 hours are exceeded before flight, students will re-accomplish this training. **(T-3)**

3.2.2.1. If available and with qualified operators, the reduced oxygen breathing device (ROBD) may be used to familiarize orientation flyers with their physiological symptoms and provide training in oxygen system use if orientation flyers are medically cleared via DD Form 2992, *Medical Recommendation for Flying or Special Operational Duty*.

3.2.2.2. Orientation briefings will be documented on an AF Form 1522, *ARMS Additional Training Accomplishment Report*, with the event description block filled out as directed by the local host aviation resource management office. **(T-3)**

3.2.2.3. Civilian/Distinguished Visitors. Wing commanders may authorize training for civilians or distinguished visitors as required. Physiology training of distinguished visitors must be associated with a pending aircraft flight or other mission-oriented purpose due to the high-risk nature of exposure to reduced partial pressures and/or barometric pressure changes during the training course. **(T-3)**

3.2.2.4. **(Added-ACC)** Orientation flyers include tandem parachute passengers and will accomplish orientation flyer training IAW AFI 10-3503.

3.2.3. All Other Requests for Training. Occasionally, specific missions may require members to receive AP training. The member's squadron commander (or equivalent) will assess the benefit of training against the risk and determine if training is required. These requests will be sent to the APTU's squadron commander. **(T-3)**

3.3. Scheduling Aerospace Physiology Training. Personnel who require AP training can refer to the Education & Training Course Announcements website: <https://usaf.dps.mil/teams/app10-etca/SitePages/home.aspx> for a listing of APTU locations and contact information. Reference **Attachment 4** for formal course ID.

3.4. Medical Requirements for Aerospace Physiology Training. Individuals must have the appropriate medical clearance in accordance with DAFMAN 48-123, *Medical Examinations and Standards*, paragraph 5.4.9.1, physiological training participation, to be eligible for altitude chamber or ROBD training. In the absence of written medical clearance, telephone verification with the student's home medical facility is authorized. Print or type the name of the person who verified the clearance, clearing flight surgeon, and clearance expiration on the flight recorder sheet for that day's training. The APTU may refuse training to any individual identified as not exhibiting the attitude commensurate with high-risk physiology training. Additionally, in coordination with the flight surgeon, the APTU may also refuse training to any individual identified as not meeting the physical health commensurate with high-risk physiology training.

3.5. Exclusions from Hypoxia Training.

3.5.1. Students will be referred to flight medicine if questions arise regarding a student's medical ability to participate in training. **(T-3)**

3.5.2. Exposures after diving. Following compressed air or mixed gas diving, surface supplied diving, or hyperbaric chamber exposure, personnel must delay altitude chamber exposure up to FL250 for at least 48 hours. If the dive requires a decompression stop or if the altitude chamber exposure exceeds FL250 then personnel must delay the exposure for at least 72 hours. **(T-3)**

3.5.3. Expiring AP Training During Pregnancy. Aircrew medically cleared to fly while pregnant who are due for AP training will complete AP academics only. Post-pregnancy and once medically cleared, they will complete the hypoxia (altitude chamber or ROBD) portion of the training prior to returning to flying status. An academics only memorandum will be generated by the APTU. Reference **Attachment 3** for an example memorandum. Upon completion of the hypoxia portion of the training an AF Form 1522 will be generated with the applicable Formal Course ID Code from **Table A4.1**. **(T-1)**

3.6. Sister Service Aerospace Physiology Training.

3.6.1. US Navy (USN) AP Training. USN AP refresher training is recognized as meeting USAF AP requirements. However, aircrew members who did not receive altitude chamber exposure for initial training must complete it prior to first flight in USAF aircraft. **(T-1)** USN AP refresher training is recognized as meeting USAF AP requirements for USAF aircrew.

3.6.1.1. AP Lead Command will evaluate USN AP refresher training at an interval not to exceed 5 years to ensure USAF AP training standards are met.

3.6.2. US Army (USA) AP Training. USA aircrew who received initial or refresher physiology training from the USA within the last 5 years are not required to complete a USAF AP training course before their first flight in USAF aircraft. Aircrew who previously completed initial training but are not current will be required to complete refresher physiology training before their first flight. USA AP refresher training is not recognized as meeting USAF AP requirements for USAF aircrew. **(T-1)** AP Lead Command will evaluate USA AP refresher training at an interval not to exceed 5 years to ensure USAF AP training standards are met.

3.6.3. APTUs may provide training support to USN, US Coast Guard, and USA organizations.

3.6.3.1. USAF aircrew/parachutist training will take priority. **(T-3)**

3.6.3.2. Units may train other US government members (e.g., US Forestry Service or Civil Air Patrol) with wing commander and AP MAJCOM PM approval.

3.6.3.3. APTUs will provide training to these organizations when available as prescribed in this instruction and/or associated USAF syllabi.

3.7. Foreign Training Program Acceptance.

3.7.1. USAF aircrew must receive AP training from the USAF Aerospace Physiology personnel regardless of foreign program acceptance status. **(T-1)**

3.7.2. Completion of accepted initial foreign AP training qualifies foreign aircrew members to receive USAF AP refresher training when needed.

3.7.3. The USAF will unconditionally accept AP training, but not centrifuge training, from the United Kingdom, Australia, Canada, and New Zealand. **(T-1)**

3.7.4. Requests for USAF AP program acceptance from other countries must be initiated through the appropriate country manager at Secretary of the Air Force, International Affairs (SAF/IA) and/or Air Force Security Assistance Training (AFSAT), who will coordinate with AP Lead Command to review the training program. **(T-1)**

3.7.5. SAF/IA will prioritize and coordinate with AFSAT to fund country approval requests. **(T-1)**

3.7.6. Upon request from SAF/IA and/or AFSAT, AP Lead Command will identify the best qualified AP personnel to review the requesting country's AP training program. **(T-1)**

3.7.7. An in-country visit is required for initial certification and observed classroom instruction must be in English. **Note:** Only the quality of training is taken into consideration for foreign program acceptance, not the quality or proficiency of English.

3.7.8. Recertification may be accomplished via courseware review at the discretion of AP Lead Command. SAF/IA will prioritize and coordinate with AFSAT to fund for country approval requests.

3.7.9. In-country visits for recertification, if deemed necessary by AP Lead Command, must be in English, and will only occur after establishing AP training curriculum acceptability (e.g., syllabi, courseware, device training profiles). **(T-1)**

3.7.10. All documentation submitted in pursuit of program acceptance must be in English.

3.7.11. Reviewers will provide a written summary of their findings and recommendations to AP Lead Command to support country acceptance determination. **(T-1)**

3.7.12. Foreign training program acceptance is valid for five years from the last day of the month acceptance is granted.

3.7.13. An in-country visit is recommended at least every second review (10 years).

Chapter 4

TYPES OF AEROSPACE PHYSIOLOGY TRAINING

4.1. Aerospace Physiology Training Courses. AP provides specified training courses based on the member's aircraft or AFSC. **Table 4.1** illustrates minimum lessons and training events required to complete AP training.

4.2. Aerospace Physiology Standardized Course Material. AP personnel will teach physiology training addressed in this manual in accordance with the published syllabi available on the AETC Flying Special Publications website: <https://trss3.randolph.af.mil/Bookstore/home/homePage.aspx>. In the absence of a published syllabus, AP Lead Command will provide guidance. **(T-2)**

4.2.1. Initial Physiology training delivered as part of an Undergraduate Flying Training, flying specialty, or AFSC-granting formal training program will be taught in accordance with the published syllabi for that course.

4.2.1.1. Sister service parachutists meet the respective physiology training requirements provided by their service. Any sister service parachutist trained by USAF AP will be trained in accordance with requirements in **Table 4.1**. **(T-1)**

4.2.1.2. All initial students will complete a written test. Test procedures/requirements will be listed in course syllabi. **(T-2)**

4.2.1.3. To receive an AF Form 1522 certifying completion of training included in **Table A4.1**, students must complete all Initial AP Requirements in **Table 4.1**. **(T-1)**

4.2.2. Refresher Training. Any person who has completed initial physiology training (except for USAFA/ROTC cadets) may requalify in AP training by taking the appropriate refresher course for their current flying duties. Refresher training may be accomplished at any time but must be completed no later than 5 years from the last day of the month during which AP training was accomplished. **(T-1)**

4.2.2.1. If more than 5 years have elapsed since the last day of the month during which prior AP training was accomplished, member is considered noncurrent and must complete appropriate refresher training before resuming flight duties. **(T-1)**

4.2.2.2. Blanket or group Refresher Training extension waivers are not authorized.

4.2.2.3. Individual Refresher Training extension waivers cannot be extended beyond eight months. Provide notification to AF/A3T when extension waivers are approved (copy to AF/A3TH). Provide guidance for MAJCOM extension waivers in MAJCOM supplements to this instruction.

4.2.2.4. Refresher training will be conducted in accordance with this manual and applicable syllabi. **(T-1)**

4.2.2.5. Cadets must re-accomplish initial training after commissioning or as part of an undergraduate flying formal training course.

4.2.2.6. Types of Refreshers. Refresher course categories are grouped based upon common aircraft characteristics and/or AFSCs. APTUs will train aircrew in accordance

with the appropriate tracks below and will not combine aircrew of different tracks. **(T-2)** To the greatest extent possible, all refresher training should emphasize aircraft-specific oxygen equipment re-familiarization and emergency procedures.

4.2.2.6.1. Track A: For aircrew who fly in aircraft equipped with an ejection seat.

4.2.2.6.2. Track T: For aircrew who fly in fixed-wing aircraft without ejection seats. **Note:** CV-22 aircrew may attend either a Track T or H course.

4.2.2.6.3. Track H: For aircrew who fly in helicopter/rotary wing aircraft.

4.2.2.6.4. Track J: For parachutists who have previously completed Initial Parachutist AP training and are Military Free Fall (MFF) qualified.

4.2.2.6.4.1. MFF qualification can be verified by the member's Host Aviation Resource Management/Squadron Aviation Resource Management office via the Individual Data Summary.

4.2.2.6.4.2. Members must repeat Initial Parachutist AP training if they did not graduate MFF before AP training expiration. **(T-1)**

4.2.2.6.5. Track R: For Remotely Piloted Aircraft (RPA) aircrew. Hypoxia practical (altitude chamber/ROBD) not required. Academics may be completed by live video teleconference. **Note:** A secure connection must be used, as this course requires discussion of mishap data/privileged information. **(T-0)**

4.2.2.6.6. Track E: For E-9 or O-6 (or higher) aircrew members or parachutists. Hypoxia practical is optional. Academics may be completed by live video teleconference. **Note:** A secure connection must be used, as this course requires discussion of mishap data/privileged information. **(T-0)**

4.2.3. The MAJCOM/A3 may establish more frequent MDS-specific training requirements.

4.2.3.1. **(Added-ACC)** MDS-Specific Training. Conduct additional AP training as required by specific 11-2-MDS series guidance or applicable directives. MDS-specific training is meant to supplement already specified training requirements and does not replace the 5-year currency requirement for refresher physiology training.

4.2.3.2. **(Added-ACC)** Physiological event training conducted via ROBD (Task ID PP10) is required every 30 months for F-22 and F-35 aircrew. Local Operations Group (OG)/Commanders (CCs) may establish more frequent MDS-specific training requirements.

4.2.3.3. **(Added-ACC)** Practical and academic training for Task ID PP10 (IAW F-22 and F-35 Ready Aircrew Program Tasking Memorandums) consists of an aircrew refresher for physiological symptoms and hypoxia-like conditions (e.g., physiological events), to include pilot familiarization with aircraft-specific life support and backup/emergency oxygen systems. This every 30-month refresher training consists of a hands-on ROBD training profile programmed for a 25,000' hypoxia demonstration. 18,000' night vision demonstration is not required unless being accomplished in conjunction with 5-year refresher training. The academic instruction should happen prior to the hands-on ROBD training profile and include a review of MDS specific hot-topics or trends related to physiological events, a discussion of aircraft oxygen systems and related emergency

procedures as outlined in the MDS specific Dash-1 and any recent updates or changes to these procedures.

4.2.3.4. **(Added-ACC)** F-22 Initial Pressure Breathing for Altitude (PBA) Training (Task ID PP11) will be accomplished as part of the F-22 B-course syllabus. The practical demo using the Ground Pressure Breathing for Altitude Trainer (GPBAT) is a one-time, in-person training requirement.

4.2.3.5. **(Added-ACC)** F-22 refresher PBA training is academics only (Task ID PP11) and should be accomplished at the same time as the F-22 PP10 training event. ACC/A3TH is the OPR for these academics and will consult with ACC Aerospace Physiology Training Operations (ACC TRSS/HP) and the F-22 AP FAM to update PBA initial and refresher course content. The OPR will solicit input from the APTU associated with the F-22 B-course as applicable and will disseminate PBA refresher academics with coordination/approval of AP lead command.

4.2.3.6. **(Added-ACC)** F-35 Constant Flow Bypass Training (CFBT, Task ID PP15) will be accomplished as part of the F-35 B-course syllabus. The practical demo will familiarize students on the normal and failure modes of the F-35 Seat Portion Assembly (SPA) and expose them to the constant flow bypass restricted breathing sensation (19 liters/minute) that results from SPA failure. The practical demo is a one-time, in-person training requirement, and will utilize a device that realistically simulates the in-aircraft experience of normal oxygen system operations and all modes of Back-up-Oxygen (BOS) Override and SPA failure modes.

4.2.3.7. **(Added-ACC)** F-35 refresher CFBT is academics only (Task ID PP15) and should be accomplished at the same time as the F-35 PP10 training event. ACC/A3TH is the OPR for these academics and will consult with ACC TRSS/HP and the F-35 AP FAM to update CFBT initial and refresher course content. The OPR will solicit input from the APTU associated with the F-35 B-course as applicable and will disseminate CFBT refresher academics with coordination/approval of AP lead command.

4.2.3.8. **(Added-ACC)** F-22 and F-35 aircrew completing the 5-year Refresher Physiological training (Track A) should receive credit for Task ID PP10 and credit for PP11 (F-22) and PP15 (F-35) refresher training if these academics are delivered during the Track A course. Aircrew will be provided an AF Form 1522, *ARMS Additional Training Accomplishment Report*, to document completion of PP10, PP11, and PP15.

4.2.4. Air Combat Command will provide guidance for AP/Full Pressure Suit training in support of U-2 operations. **(T-2)**

4.2.4.1. **(Added-ACC)** Original Pressure Suit Training IAW U-2 syllabus. A one-time requirement provided upon initial assembly and fitting of the pressure suit assembly. Reference local 9th Reconnaissance Wing Physiological Support Squadron (9 PSPTS) OI for course entry criteria and specific physiological training requirements.

4.2.4.2. **(Added-ACC)** Refresher Pressure Suit Training. Required every five years for those who have undergone original pressure suit training. Course content will meet the requirements of a Track A refresher course, and provide pressure suit and routine refresher training simultaneously with emphasis on both the high altitude and companion trainer aircraft.

Table 4.1. Aerospace Physiology Training Requirements.

Initial Training Requirements	Initial			Initial Parachutist		
A. Introduction to Human Factors	1			1		
B. Physiological Effects of Altitude	X			X		
C. Performance Threats	X			X		
D. Physiology Considerations of Aircrew Breathing Systems	X			X		
E. Cabin Pressurization/Depressurization	X			X		
F. Vision	X			X		
G. Spatial Disorientation	X					
H. Noise and Vibration	X			X		
I. Attention Management Threats to Situational Awareness	X			X		
J. Acceleration	2					
K. Physiology Considerations of Aircraft Egress	X					
L. Altitude Chamber	X			X		
M. Barany Chair/Spatial Disorientation Trainer	X					
N. Unaided Night Vision Trainer	X			X		
Refresher Training Requirements by Tracks	A	T	H	J	R	E
O. Physiological Effects of Altitude	X	X	X	X		X
P. Performance Threats	X	X	X	X	X	
Q. Physiology Considerations of Aircrew Breathing Systems	3	3	3	3		
R. Vision	X	X	X	X		
S. Spatial Disorientation	X	X	X		X	X
T. Noise and Vibration	X	X	X	X		
U. Attention Management Threats to Situational Awareness	X	X	X	X	X	X
V. Acceleration	X					2
W. Altitude Chamber or ROBD	X	X	X	X		4
Notes:						
1. Human Factors will be taught to mission specific requirements e.g. Aviation and/or MFF environment.						
2. If member flies a high-G aircraft as described in AFMAN 11-404, <i>Fighter Aircrew Acceleration Training Program</i> .						
3. In addition to AP curriculum, instructors will also teach MAJCOM/A3T identified Special Interest Item, FCIF, as required by respective Notice to Airmen or safety requirements.						
4. Hypoxia exposure not required but highly encouraged if device is available.						

Chapter 5

AEROSPACE PHYSIOLOGY TRAINING OPERATIONS

5.1. Qualified Personnel. Only trained and qualified AP personnel and AP personnel in upgrade or qualification training under supervision will provide AP training. **(T-1)**

5.2. Aerospace Physiology Training Content. Physiology training consists of a live, in-person academic instruction and a practical hypoxia exposure via the altitude chamber or ROBD. **Note:** Track E and R are the exceptions.

5.3. Aerospace Physiology Training Devices. Only AP personnel (under supervision if in upgrade or qualification training) will operate AP training devices. Devices must be operated in accordance with this manual technical order, device operating manual, respective CFETP, and approved unit Operating Instructions. **(T-1)**

5.3.1. Local operating instructions will follow Air Force Occupational Safety and Health standards. **(T-1)**

5.3.2. Altitude chamber units will exercise the most probable adverse reactions (including, but not limited to, ear and sinus issues, decompression sickness (DCS), claustrophobia, trapped gas, etc.) and emergency procedures associated with altitude chamber training at least once quarterly and with base first-responders at least once annually. **(T-3)**

5.3.3. Units with ROBDs will exercise the most probable adverse reactions (including, but not limited to, loss of consciousness, apprehension, etc.) and emergency procedures associated with ROBD training with base first-responders at least once annually. **(T-3)**

5.3.4. With the exception of **paragraph 7.3**, use of AP training devices for experimental activities is not authorized without AP Lead Command approval. **(T-1)**

5.3.5. Training devices will not be modified without authorization from AP Lead Command. **(T-1)**

5.4. Completion of Device Training. Students who do not complete altitude chamber or ROBD training objectives within 30 calendar days of academic instruction must repeat training in its entirety. **(T-2)**

Chapter 6

ACADEMIC TRAINING

6.1. Aerospace Physiology Training Purpose. The purpose of AP training is to provide aircrew and parachutists the knowledge, skills, and attitudes to optimize performance in challenging air and space operations. AP training systems provide training environments that replicate high altitude, high-G, and orientation-compromised exposures in which personnel can apply preventive countermeasures and practice emergency procedures. Providing academic lessons followed by hands-on application in a controlled environment maximizes student learning while minimizing risk exposure.

6.2. Flying Training Courseware. AP courseware will be posted on the AETC Undergraduate Flying Training Special Publications site for instructor use.

6.2.1. All AP instructors will have access to courseware. Requests for access to the AETC Flying Training Special Publications site may be made on the site itself at <https://trss3.randolph.af.mil/Bookstore/home/homePage.aspx>.

6.2.2. Use the Course Change Request through the AETC Undergraduate Flying Training Special Publications website to submit recommendations for changes.

6.3. Academic Instructor Qualification and Currency.

6.3.1. Instructors must have an initial course evaluation/qualification on file for each block of instruction of each course they teach. **(T-2)** An instructor is considered “qualified” in a course after being qualified in each block and instructing the entire course.

6.3.2. Instructors must be evaluated every 12 months on one or more blocks of instruction for which they are qualified. Annual evaluations will not be conducted for the same block of instruction within a 36-month period. **(T-2)** Instructors evaluated within the previous 12 months are considered “current.”

6.3.3. Aerospace Physiology Instructors who have served 15 or more years in the AP career field and are assigned to a MAJCOM staff, Headquarters Air Force, or other position outside of the career field are granted 24-month currency. **(T-2)**

6.3.4. Instructors must be current and qualified in order to teach aircrew unsupervised. **(T-2)**

6.3.5. At the request of the instructor’s commander, MAJCOM PMs may extend an annual evaluation date by up to three months on a case-by-case basis.

6.3.6. Initial and currency evaluations will be documented on a comprehensive instructor evaluation form. Authorized forms are AETC Form 281, *Instructional Evaluation*, AETC Form 281A, *Instructor Evaluation Checklist*, or AETC Form 620, *Academic Instructor Monitoring Checklist*. **(T-2)**

6.3.7. Instructors will be evaluated by the most senior current and qualified 13HX or 1H0X1 instructor available. MAJCOM PMs will evaluate the senior instructor from each unit within their MAJCOM annually. **(T-2)** If MAJCOM PMs are not available, they may request another 13HX/1H0X1 member within their command or local Stan/Eval to conduct evaluations.

Chapter 7

ALTITUDE CHAMBER OPERATIONS

7.1. Altitude Chamber. The altitude chamber training system creates a low-pressure training environment within which students experience the effects of pressure change associated with decompression and practice mitigation strategies. Effects include, but are not limited to, hypoxia, gas expansion/compression, temperature fluctuations, and breathing cycle changes.

7.2. Personnel Requirements.

7.2.1. Physiology Training personnel assigned to an APTU take part in altitude chamber flights as required. Unless otherwise noted on a member's DD Form 2992, an individual placed on DOWN status may perform all chamber duties except for Inside Observer (IO). If a member is medically unable to perform outside altitude chamber duties, it will be annotated on the member's DD Form 2992. **(T-3)**

7.2.2. Standard chamber crew complement will include: lecturer, chamber operator, crew chief, recorder, lock operator, aerospace physiologist officer (APO), and IOs. **(T-3)**

7.2.2.1. For initial training profiles, student-to-IO ratio must not exceed six-to-one. **(T-3)**

7.2.2.2. For refresher training profiles, student-to-IO ratio must not exceed nine-to-one. **(T-3)**

7.2.2.3. Rapid decompression profiles require one IO. **(T-3)**

7.2.2.4. The lock operator position is not required for an altitude chamber flight with a single student.

7.2.2.5. Every chamber flight must have all 13HX and 1H0X1 crew members current in cardiopulmonary resuscitation (CPR) training to include use of the automated external defibrillator (AED). **(T-3)**

7.2.3. Deviations from the standard crew complement are not authorized without squadron commander approval. Commanders will not approve blanket or group deviations, but instead authorize deviations on a case-by-case basis. **(T-3)**

7.3. Medical Evaluation Chamber Flights. These flights are not aircrew training events.

7.3.1. These flights require direct supervision by a flight surgeon. **(T-3)**

7.3.2. Unique flight profiles to evaluate individual patients will be determined by the flight surgeon in consultation with the APO. **(T-3)**

7.3.3. Flights to FL180 or higher require 30 minutes of denitrogenation at ground level with 100 percent oxygen prior to climbing to altitude. **Exception:** An ear and sinus check may be conducted to 5,000 feet above ground level while denitrogenation is being conducted.

7.3.4. Flights will not expose any person to altitudes at or above FL250 for more than 30 minutes or above FL180 for more than one hour. **(T-3)**

7.3.5. Except for the APO and IOs, the standard crew complement for altitude chamber training does not apply.

7.3.6. Medical evaluation flights must not interfere with aircrew training. **(T-3)**

7.3.7. A flight surgeon (with DD Form 2992 UP status) may accompany a qualified IO to directly monitor patients during medical evaluation flights.

7.4. Fire Safety.

7.4.1. Due to repeated exposure to fire risks, all crewmembers will wear approved flight clothing (flight suit and boots) while performing altitude chamber duties as IO and crew chief. **(T-3)**

7.4.2. AP personnel servicing pressurized gas containers will wear Nomex[®] gloves, approved flight clothing, and eye protection. Gloves must be clean of dirt or grease stains to maximize their flame-resistant properties. **(T-3)**

7.4.3. Closed and appropriately capped pressurized gas cylinders being moved in banks do not require personal protection equipment wear.

7.5. Altitude Exposure Limitations.

7.5.1. Maximum exposures for IOs:

7.5.1.1. At least 48 hours must elapse between exposures to altitudes above FL180. **(T-3)**

7.5.1.2. At least 48 hours must elapse between rapid decompression flights. **(T-3)**

7.5.1.3. A rapid decompression to or below FL180 may be taken immediately following exposure to FL250. **(T-3)**

7.5.1.4. IOs and students will not exceed FL250. **(T-3)**

7.5.1.5. IOs and students will not remain at FL250 for more than 30 minutes. **(T-3)**

7.5.1.6. IOs and students will not remain between 18,000–24,999 feet for more than 1 hour. **(T-3)**

7.6. Altitude Chamber Flights.

7.6.1. Pre-Flight Student Briefing. At minimum, all students will be briefed on the following altitude chamber flight objectives prior to altitude chamber training. **(T-2)**

7.6.1.1. Demonstrate proper oxygen equipment discipline and in-flight oxygen checks.

7.6.1.2. Exhibit proper techniques to combat mechanical effects of pressure change for ear, sinus, and gastrointestinal gas expansion.

7.6.1.3. Accomplish all steps for complete hypoxia recovery without assistance.

7.6.1.4. Identify and use emergency/portable oxygen equipment.

7.6.1.5. Recognize and correct night vision deficiencies resulting from decreased oxygen.

7.6.1.6. Determine physical indications and physiological effects of a rapid decompression (only required for initial students).

7.6.1.7. Identify when, how, and why to use the “Knock it off” hand signal.

7.6.2. Altitude Chamber Adverse Reactions.

7.6.2.1. Altitude chamber adverse reactions will be tracked using the grading scale in **Table 7.1** and will include the anatomical location of the reaction (e.g., right ear, abdominal pain, etc.). **(T-2)**

Table 7.1. Altitude Chamber Adverse Reaction Grades.

Grade	Description
1	Requires, for example, but not limited to, verbal instruction, vasoconstrictor administration, or other IO intervention but does not require student removal.
2	Requires removal from the altitude chamber and/or a response to suspected DCS without hospitalization.
3	Requires admission to the hospital or treatment in the hyperbaric chamber. All Grade 3 reactions require flight surgeon consult and must be reported to the local Wing Safety Office. (T-3)

7.6.2.2. All confirmed DCS cases resulting from altitude chamber training are managed as occupational illnesses. **(T-2)**

7.6.2.3. Upon request, AP personnel will provide any necessary information (e.g., flight profiles, time at altitude, etc.) to those who report altitude chamber DCS for the fullest and most accurate narrative of the incident. **(T-3)**

7.6.2.4. APTUs will review adverse reaction data for trends and adjust training operations based on any lessons learned. **(T-3)**

7.6.3. Post-Flight Student Debriefing. At minimum, all students will be briefed on the following points after altitude chamber training. **(T-2)**

7.6.3.1. Students will not participate in physical exercise or strenuous activity for a period of 12 hours. **(T-3)**

7.6.3.2. Students may fly as crewmembers or passengers without a required surface interval after altitude chamber flights between FL180 and FL250, but aircraft cabin altitude must remain below FL180. **(T-3)**

7.6.3.3. Students must delay subsequent unpressurized flights above FL180 for 48 hours following altitude chamber training above FL180. **(T-3)**

7.6.3.4. Students should perform periodic ear/sinus pressure equalization throughout the day/evening to prevent delayed ear blocks.

7.6.3.5. Students should avoid alcohol consumption for 12 hours after an altitude chamber exposure. Alcohol can cause dehydration which can increase risk of DCS, and effects from alcohol can mask DCS symptoms.

7.6.3.6. Students should monitor their fatigue level after an altitude chamber exposure.

7.6.3.7. Students will be given contact information and procedures to report suspected DCS while in the local area, outside the local area, and after hours. **(T-3)**

Chapter 8

REDUCED OXYGEN BREATHING DEVICE (ROBD) OPERATIONS

8.1. Reduced Oxygen Breathing Device Training Systems. ROBD describes a nonspecific training system that provides hypoxia recognition and emergency procedures training using normobaric, reduced oxygen gas mixtures. It does not define a brand name or particular device. ROBD training allows some students to wear their primary oxygen equipment and is an acceptable training system for refresher AP training.

8.2. Reduced Oxygen Breathing Device Setup. The ROBD will be used in conjunction with a HFT, Mission Crew Hypoxia Familiarization Trainer (MCHFT), or Parachute Operations Hypoxia Familiarization Trainer (POHFT). **(T-2)** Aircraft flight simulators that can accommodate ROBDs with MDS-specific oxygen systems may be used to improve training and emergency procedure realism.

8.3. Hypoxia Familiarization Trainer. The HFT is a generic flying simulation video game (not an actual aircraft simulator) which can be customized to represent the oxygen equipment configurations of various aircraft for more realistic training. It provides a flight task scenario for use with an ROBD during which aircrew can undergo hypoxia recognition and oxygen system emergency procedures training. Training scenarios should be MDS/mission-specific and enable aircrew to practice using their primary oxygen system(s) to the maximum extent possible. The HFT may also be used by non-pilot crewmembers to complete training. Helmets and masks are not provided by APTT locations; students must bring their own AFE gear. APTT personnel may coordinate local support agreements for AFE gear with host wing AFE.

8.4. Mission Crew Hypoxia Familiarization Trainer. The MCHFT is designed for non-pilot crewmembers. It uses cognitive performance software to demonstrate performance decrements during hypoxia exposure.

8.5. Parachute Operations Hypoxia Familiarization Trainer. The POHFT is designed for parachutists. It mimics an aircraft operational environment to produce a more realistic scenario for both the hypoxia exposure and visual acuity demonstration.

8.6. Device Modification. ROBD, HFT, MCHFT, and POHFT hardware and software will not be modified without approval from AP Lead Command. **(T-1)**

8.7. Personnel Requirements.

8.7.1. Each ROBD must have a qualified and dedicated Instructor/Operator during training. **(T-2)**

8.7.2. Personnel filling ROBD Instructor/Operator positions must be current in CPR training to include use of the AED. **(T-3)**

8.8. Reduced Oxygen Breathing Device Pre-flight Briefing. At minimum, all students will be briefed on the following objectives prior to ROBD training. **(T-2)**

8.8.1. Demonstrate proper oxygen equipment discipline and in-flight oxygen checks.

8.8.2. Accomplish all steps for complete hypoxia recovery without assistance.

8.8.3. Recognize night vision deficiencies resulting from decreased oxygen.

8.9. Reduced Oxygen Breathing Device Post-Flight Debriefing. At minimum, all students will be briefed on the following topics after ROBD training. **(T-3)**

8.9.1. Students should contact a flight surgeon or emergency treatment facility in the event unusual symptoms occur after the completion of ROBD training.

8.9.2. There are no aircrew, jump, or passenger flight restrictions placed on personnel following ROBD training.

8.9.3. Students should monitor their fatigue level after ROBD training.

Chapter 9

OTHER TRAINING DEVICES

9.1. Other Aerospace Physiology Training Devices. Some AP training devices are used solely within a specific MAJCOM (e.g., pressure breathing training devices for F-22). Guidance and sustainment for these devices should be provided via MAJCOM AP PM/MFM and/or a MAJCOM supplement to this publication. Guidance and sustainment for devices used by more than one MAJCOM (e.g., Barany Chairs) will be maintained by AP Lead Command. **(T-1)**

9.2. Barany Chair. The Barany Chair is a rotational device used to provoke a response to motion within an individual's vestibular system. The purpose of this device is to accomplish spatial disorientation flying training objectives. Barany Chairs are also used in support of the Airsickness Management Program IAW AETCI 48-102, *Management of Medical Support to Flying Training Missions*, and other aerospace medical guidance.

9.2.1. AP-owned Barany Chairs may support local Airsickness Management Programs.

9.2.2. AP personnel may support local Airsickness Management Programs.

9.2.3. Support to Airsickness Management Programs will be conducted IAW flight surgeon guidance and must not interfere with aircrew training. **(T-3)**

9.3. (Added-ACC) Ground Pressure Breathing for Altitude Trainer (GPBAT). This trainer is used for PBA initial F-22 high altitude pressure breathing familiarization (Task ID PP11) IAW the F-22 B-course syllabus and local operating instructions. Sustainment, calibration and maintenance of the trainer will be accomplished IAW the local Precision Measurement Equipment Laboratory (PMEL) unit.

Chapter 10

DEVICE MANAGEMENT

10.1. Device Maintenance.

10.1.1. Maintenance of all devices and associated equipment (e.g., masks, oxygen cylinders, helmets, connectors, etc.) must be accomplished according to the appropriate technical orders, commercial manuals, contract vehicles, and/or AP Lead Command guidance. **(T-1)**

10.2. Device Status Reporting.

10.2.1. APTUs will document altitude chamber and vacuum pump maintenance/discrepancies on Air Force Technical Order (AFTO) Form 244, *Industrial/Support Equipment Record*, AFTO Form 245, *Industrial/Support Equipment Record (Continuation)*, AFTO Form 95, *Significant Historical Data*, electronic equivalent, or maintenance information system as directed by AP Lead Command. **(T-1)**

10.2.2. Original AFTO Forms 244/245 and 95 will remain with the device in the event of relocation or are turned in to AP Lead Command when a device is removed from service. **(T-1)**

Chapter 11

TRAINING ADMINISTRATION AND REPORTS

11.1. Documentation of Aerospace Physiology Training. Units will use the following AF Forms. **(T-1)**

11.2. AF Form 1522.

11.2.1. AP training will be certified and documented on the AF Form 1522 using the appropriate formal course identification (ID) from **Table A4.1**. **(T-1)**

11.2.2. Signed AF Forms 1522 will be provided to students. **(T-3)**

11.2.3. Certifying officials for AP training must be Primary Air Force Specialty Code (PAFSC) 13HX/1H071 or higher (1H051s stationed without 13HXs are permitted to certify only on tracks that the 1H051s are authorized to teach). **(T-1)** See **Attachment 4** for guidance on completing the AF Form 1522.

11.3. Hazardous Duty Pay.

11.3.1. Per Title 37 United States Code (USC) § 301, *Incentive Pay: Hazardous Duty*, hazardous duty pay is authorized for personnel performing inside observer duty in an altitude chamber. **(T-0)**

11.3.2. Units will manage hazardous duty pay in accordance with AFMAN 65-116 Volume 2, *Defense Joint Military Pay System Active Component (DJMS-AC) Unit Procedures Excluding Financial Management Flights*. **(T-0)**

11.4. Altitude Chamber Flight Record. Units must maintain record of individual altitude chamber flights. Units will use locally developed forms that include at least the following:

11.4.1. Names of chamber crew members assigned to each position. **(T-1)**

11.4.2. Names of students, their associated seats, and equipment identifiers. **(T-1)**

11.4.3. Training profile conducted, total time above FL180, and total time at FL250. **(T-1)**

11.4.4. All adverse student reactions will be documented in accordance with **Table 7.1** and include corresponding altitudes, times, and treatments. **(T-1)**

11.5. Reports. APTUs will provide manning, student training, and device utilization/maintenance statistics quarterly as directed by AP Lead Command. **(T-1)**

ADRIAN L. SPAIN, Lt Gen, USAF
Deputy Chief of Staff, Operations

(ACC)

TED T. UCHIDA, SES, DAF
Deputy Director of Operations

Attachment 1**GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION*****References***

37 USC § 301, *Incentive Pay: Hazardous Duty*

DoD 7000.14-R, *Department of Defense Financial Management Regulation*, December 2021

DAFPD 10-9, *Lead Command/Lead Agent Designation and Responsibilities for United States Air Force Weapons System, Non-Weapon Systems, and Activities*, 25 May 2021

AFPD 11-2, *Aircrew Operations*, 31 January 2019

AFPD 11-4, *Aviation Service*, 12 April 2019

DAFI 90-302, *The Inspection System Of The Department Of The Air Force*, 15 March 2023

DAFI 91-204, *Safety Investigations and Reports*, 10 March 2021

DAFMAN 11-401, *Aviation Management*, 27 October 2020

DAFMAN 48-123, *Medical Examinations and Standards*, 8 December 2020

DAFMAN 90-161, *Publishing Processes and Procedures*, 18 October 2023

AFI 10-3503, *Personnel Parachute Operations*, 23 September 2020

AFI 33-322, *Records Management and Information Governance Program*, 23 March 2020

AFMAN 11-202 Volume 1, *Aircrew Training*, 27 September 2019

AFMAN 11-202 Volume 2, *Aircrew Standardization and Evaluation Program*, 30 Aug 2021

AFMAN 11-404, *Fighter Aircrew Acceleration Training Program*, 27 November 2019

AFMAN 65-116 Volume 2, *Defense Joint Military Pay System Active Component (DJMS-AC) Unit Procedures Excluding Financial Management Flights*, 23 December 2019

AETCI 48-102, *Management of Medical Support to Flying Training Missions*, 7 March 2019

AIR STD ASM 3003 Edition 1 Version 4, *Aviation Medicine/Physiological Training of Aircrew*, 30 April 2021

AIR STD ASM 3010 Edition 1 Version 3, *Aviation Medicine/Physiological Training of High Altitude Parachutists*, 30 April 2021

INFO PUB ASM 3009 Edition 1 Version 3, *Spatial Disorientation*, 23 May 2020

NATO STANAG 3114, *Aeromedical Training of Flight Personnel*, 5 February 2018

NATO STANAG 3474, *Temporary Flying Restrictions Due to Exogenous Factors Affecting Aircrew Efficiency*, 19 July 2018

Adopted Forms

DD Form 2992, *Medical Recommendation for Flying or Special Operational Duty*

DAF Form 847, *Recommendation for Change of Publication*

AF Form 1522, *ARMS Additional Training Accomplishment Report*
AFTO Form 244, *Industrial/Support Equipment Record*
AFTO Form 245, *Industrial/Support Equipment Record (Continuation)*
AFTO Form 95, *Significant Historical Data*
AETC Form 281, *Instructional Evaluation*
AETC Form 281A, *Instructor Evaluation Checklist*
AETC Form 620, *Academic Instructor Monitoring Checklist*

Abbreviations and Acronyms

(Added-ACC) ACC—Air Combat Command
AED—automated external defibrillator
AETC—Air Education and Training Command
AETCI—Air Education and Training Command Instruction
AFCFM—Air Force Career Field Manager
AFE—Aircrew Flight Equipment
AFGM—Air Force Guidance Memorandum
AFI—Air Force Instruction
AFMAN—Air Force Manual
AFOCD—Air Force Officer Classification Directory
AFPD—Air Force Policy Directive
AFSAT—Air Force Security Assistance Training
AFSAS—Air Force Safety Automated System
AFSC—Air Force Specialty Code
AFSEC—Air Force Safety Center
AFTO—Air Force Technical Order
AP—Aerospace Physiology
APO—Aerospace Physiologist Officer
APTF—Aerospace Physiology Training Flight
APTT—Aerospace Physiology Training Team
APTU—Aerospace Physiology Training Unit
(Added-ACC) APTU—ACC Aerospace Physiology Training Unit
CAPE—Council of Aerospace Physiology Executives
(Added-ACC) CC—Commander

CFETP—Career Field Education and Training Plan

CPR—Cardiopulmonary Resuscitation

DAF—Department of the Air Force

DCS—Decompression Sickness

DAFMAN—Department of the Air Force Manual

DAFPD—Department of the Air Force Policy Directive

(Added-ACC) FAM—Functional Area Manager

FCIF—Flight Crew Information File

(Added-ACC) FTU—Formal Training Unit

(Added-ACC) GPBAT—Ground Pressure Breathing for Altitude Trainer

HAF—Headquarters Air Force

HFT—Hypoxia Familiarization Trainer

IAW—In Accordance With

ID—Identification

IO—Inside Observer

JCIDS—Joint Capabilities Integration and Development System

MAJCOM—Major Command

MCHFT—Mission Crew Hypoxia Familiarization Trainer

MDS—Mission Design Series

MFF—Military Free Fall

MFM—MAJCOM Function Manager

(Added-ACC) MQT—Mission Qualification Training

NATO—North Atlantic Treaty Organization

(Added-ACC) OG—Operations Group

OPR—Office of Primary Responsibility

OSR—Occupational Survey Reports

PAFSC—Primary Air Force Specialty Code

(Added-ACC) PBA—Pressure Breathing for Altitude

PM—Program Manager

(Added-ACC) PMEL—Precision Measurement Equipment Laboratory

POHFT—Parachute Operations Hypoxia Familiarization Trainer

PM—Program Manager

(Added-ACC) PSPTS—Physiological Support Squadron

ROBD—Reduced Oxygen Breathing Device

ROTC—Reserve Officer Training Corps

RPA—Remotely Piloted Aircraft

SGP—Chief of Aerospace Medicine

SKT—Special Knowledge Test

SME—Subject Matter Expert

SPO—System Program Office

STANAG—Standardization Agreement

Stan/Eval—Standardization/Evaluation

(Added-ACC) TRSS—Training Support Squadron

US—United States

USA—United States Army

USAF—United States Air Force

USAFA—United States Air Force Academy

USC—United States Code

USN—United States Navy

Office Symbols

19 AF/A3OA—19th Air Force, Operations, Aircrew Performance Branch/Aerospace Physiology Lead Command

(Added-ACC) ACC TRSS/HP—ACC Aerospace Physiology Training Operations

AF/A3T—Director of Training and Readiness, Deputy Chief of Staff of Operations

AF/A3TH—Aircrew Performance Division

AF/SE—Air Force Chief of Safety

AFSEC/JA—Air Force Safety Center Office of The Judge Advocate General

MAJCOM/A3—MAJCOM, Director of Operations

SAF/IA—Secretary of the Air Force, International Affairs

Attachment 2

SAMPLE CONTRACTOR TRAINING MEMORANDUM

Figure A2.1. Contractor Training Memorandum.

	DATE
MEMORANDUM FOR (Organization providing training)	
FROM: YOUR OFFICE INFORMATION	
SUBJECT: Training Required by US Government Contract	
1. Contract Reference: Contract name/number XXXXXXXX	
2. IAW AFMAN 11-403, para 3.1.4.1., I have verified the government's responsibility to provide physiological training to the following contractor personnel, and I have verified that these personnel are required to fly in support of YOUR UNIT's mission. Ellen Ripley, Org/Office Symbol Indiana Jones, Org/Office Symbol Han Solo, Org/Office Symbol	
3. If you have any questions, I can be contacted at (###-###-####) or john.doe@email.mil .	
	Signature Block Government Flight Representative (or Quality Assurance Evaluator)

Attachment 3

SAMPLE ACADEMICS ONLY TRAINING FOR PREGNANCY MEMORANDUM

Figure A3.1. Academics Only Training for Pregnancy Memorandum.

	DATE
MEMORANDUM FOR ### XX/HARM	
FROM: YOUR OFFICE INFORMATION	
SUBJECT: Aerospace Physiological Training during Pregnancy	
<p>1. In accordance with AFMAN 11-403, <i>Aerospace Physiology Training Program</i>, paragraph 3.5.3, "Aircrew medically cleared to fly while pregnant who are due for AP training will complete AP academics only. Post-pregnancy and once medically cleared, they will complete the hypoxia (altitude chamber or ROBD) portion of the training prior to returning to flying status." Once medically cleared following pregnancy, aircrew will complete hypoxia exposure prior to their first flight.</p>	
<p>2. Please update [Rank First MI. Last Name] physiological training due date to the expiration date of the pregnancy AF Form 469, <i>Duty Limiting Condition Report</i>. Upon completion of the hypoxia portion, a new AF Form 1522, <i>ARMS Additional Training Accomplishment Report</i>, will establish a new physiological training expiration using the date of the AF Form 1522.</p>	
<p>3. If you have any further questions or concerns, please contact [AFB] Aerospace Physiology at DSN ###-####, COMM ###-###-####.</p>	
<p>Signature Block JANE DOE, Maj, USAF Flight Commander</p>	

Attachment 4

AEROSPACE PHYSIOLOGY FORMS AND COMPLETION STANDARDS

A4.1. General. This attachment provides guidance for the completion of forms required to document AP training.

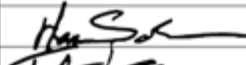




A4.2. AF Form 1522. APTUs must maintain copies of completed AF Forms 1522 in accordance with the Air Force Records Disposition Schedule. The Last Name field must include, at a minimum, first name, last name, and middle initial. The Aircrew Signature field is self-explanatory. The SSN field will not be used. The Unit field is optional. The Event Description field must contain the Formal Course ID Code from [Table A4.1](#). The Task ID field is left blank. The Date Accomplished field is the date training is completed. If not digitally signed, the Certification field must include printed name and signature. See [Figure A4.1](#) for example.

A4.3. When completing AF Form 1522 for Cadet training, document with “Cadet” and note expiration date as commissioning date. 306 FTG/CC may extend expiration date up to one year (but not to exceed 5 years from the date of initial training) for cadets who have commissioned and are supporting USAFA Airmanship programs. Document on AF Form 1522 with “Refresher course not authorized.”

Table A4.1. Aerospace Physiology Training Formal Course ID Codes.

Formal Course ID	Training Course
S-O-B/A-APH-I	Initial Physiology Training
AP RPA-I	Initial RPA AP Training (no hypoxia exposure)
AP RPA-R	Refresher RPA AP Training (no hypoxia exposure)
S-O-B/A-APH-R	Refresher Physiology Training

Figure A4.1. Completed 1522 Example.

ARMS ADDITIONAL TRAINING ACCOMPLISHMENT REPORT (See Reverse for Completion Instructions)						
<small>AUTHORITY: 10 U.S.C. 8013 AND EO 9397 PRINCIPAL PURPOSE: Source document for recording individual training events for input into the Aviation Resource Management System (ARMS). To validate accomplishment of mandatory training requirements. ROUTINE USES(S): None. DISCLOSURE IS VOLUNTARY: Failure to provide the information and SSN for individuals who must meet training currency standards could result in loss of currency, grounding and loss of professional qualification. SSN is used for identification and records.</small>						
LAST NAME	AIRCREW SIGNATURE	SSN	UNIT	EVENT DESCRIPTION	TASK ID	DATE (YYYYMMDD) ACCOMPLISHED
Han NMI Solo			14 PRSCS	S-O-B/A-APH-I		20220707
Indiana W. Jones			81 UW	S-O-B/A-APH-I		20220707
Pete "Maverick" M. Mitchell			142 VF	S-O-B/A-APH-I		20220707
Nick "Goose" Bradshaw	No show		142 VF	S-O-B/A-APH-I		20220707
Ellen L. Ripley			426 LV	S-O-B/A-APH-I		20220707
<i>Last Item</i>						
CERTIFICATION (Print Name, Grade, and Phone #. Wet Signature or e-Sign)						
 Digitally signed by CHASE.ERIC.G.1367323384 Date: 2022.07.07 0:01:55 -06'00'		ARMS PROCESSING COMPLETED				
DATE		INPUT INITIALS		AUDIT INITIALS		