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MEMORANDUM FOR DISTRIBUTION C

MAJCOMs/FLDCOMs/FOAs/DRUs

FROM: HQ USAF/A3
1630 Air Force Pentagon
Washington, DC 20330-1630

SUBJECT: Department of the Air Force Guidance Memorandum to AFMAN 11-404, *Fighter Aircrew Acceleration Training Program*

By Order of the Secretary of the Air Force, this Air Force Guidance Memorandum (AFGM) immediately implements changes to Air Force Manual (AFMAN) 11-404. Compliance with this memorandum is mandatory. To the extent its directions are inconsistent with other Department of the Air Force publications, the information herein prevails, in accordance with Department of the Air Force Instruction (DAFI) 90-160, *Publications and Forms Management* and Department of the Air Force Manual (DAFMAN) 90-161, *Publishing Processes and Procedures*. This guidance is applicable to the Regular Air Force (RegAF), Air National Guard (ANG), and Air Force Reserve (AFR).

This AFGM updates incorrect administrative and organizational verbiage, and an attachment has been included (see below) due to the lengthy changes. Ensure all records created as a result of processes prescribed in this publication are maintained in accordance with AFI 33-322, *Records Management and Information Governance Program*, and disposed of in accordance with the Air Force Records Disposition Schedule (RDS) located in the Air Force Records Management System.

This Memorandum becomes void after one year has elapsed from the date of this Memorandum, or upon incorporation by interim change or rewrite of AFMAN 11-404, whichever is earlier.

JAMES C. SLIFE., Lt Gen, USAF
Deputy Chief of Staff, Operations

AFMAN 11-404_AFGM2023-01

Attachment:

AFMAN11-404_AFGM2023-01 Changes

ATTACHMENT**AFMAN11-404_AFGM2023-01 Changes**

Current guidance in AFMAN 11-404 remains in effect with the following additions/changes:

(changed) This manual implements Air Force Policy Directive (AFPD) 11-4, *Aviation Service*. It establishes guidance and procedures for the acceleration training of aircrew and operational support flyers who are either currently flying or are selected to fly high-Gravity (G) aircraft. This publication applies to the Regular Air Force (RegAF), Air National Guard (ANG), and Air Force Reserve (AFR). This publication does not apply to the United States Space Force. Forward publication change recommendations on DAF Form 847, *Recommendation for Change of Publication*, through the appropriate functional chain of command. This publication may be supplemented at any level, but route all major command (MAJCOM)/direct reporting unit (DRU) supplements to 19th Air Force Aircrew Performance Branch (19 AF/A3OA) for coordination prior to certification and approval. NOTE: 19AF/DOA is now 19AF/A3OA. Field units below MAJCOM/DRU level forward copies of their supplements of this publication to their parent MAJCOM/DRU Office of Primary Responsibility (OPR) for coordination. The authorities to waive wing/unit level requirements in this publication are identified with a Tier (“T-0, T-1, T-2, T-3”) number following the compliance statement. See DAFMAN 90-161, *Publishing Processes and Procedures* for a description of the authorities associated with the Tier numbers. Submit requests for waivers through the chain of command to the appropriate Tier waiver approval authority, or alternately, to the requestor’s commander for non-tiered compliance items. Additional waiver authority to this publication is described in [paragraph 1.3](#).

(changed) This manual requires the collection and/or maintenance of information protected by the Privacy Act of 1974 authorized by 10 U.S.C. 9013, Secretary of the Air Force; AFMAN 11-403 *Aerospace Physiological Training Program*; 37 U.S.C. 301a, Incentive Pay: aviation career; Public Law 92-204, Appropriations Act for 1973; Section 715 Public Law 93-570, Appropriations Act for 1974; Public Law 93-294, Aviation Career Incentive Act of 1974; DoD Instruction 7730.57, Aviation Incentive Pays and Continuation Bonus Program; and E.O. 9397 (SSN), as amended. The applicable System of Records Notices F044 AF SG H Air Force Aerospace Physiology Training Programs and F011 AF XO A Aviation Resource Management System (ARMS) are available at: <https://dpcl.d.defense.gov/privacy/SORNS.aspx>. Ensure all records created as a result of processes prescribed in this publication are maintained in accordance with Air Force Instruction (AFI) 33-322, *Records Management and Information Governance Program*, and disposed of in accordance with the Air Force Records Disposition Schedule located in the Air Force Records Information Management System (AFRIMS).

(changed) This document is substantially revised and must be completely reviewed. This revision updates office symbols, organizational authorities, and updates areas such as the movement of Aerospace Physiology to the LAF. Waiver/approval authorities have been added in accordance with DAFMAN 90-161. Other changes include: re-designation of the F-35 to a Type 2 aircraft; refresher acceleration training requirements for Type I aircrew after 39 months in a non-flying billet; adds requirement for 37th Training Wing (37 TRW) to provide registrar support for tracking aircrew training in Oracle Training Application (OTA); an Instructor Pilot (IP) who evaluates other aircrew members on their Anti-G Straining Maneuver (AGSM) must complete a minimum of academics on the physiology effects of G and the AGSM; USAF

acceptance of United States Navy (USN) F-16 centrifuge training for Type 2 aircraft; added Wing Commander (CC) responsibility to appoint Fighter Aircrew Conditioning Program (FACP) instructors; removed FACP observer training requirement under the oversight of FACP instructors; removed centrifuge training profiles for Primary, Advanced, Refresher and Commander Directed Acceleration Training.

1.2. (changed) Fighter Aircrew Acceleration Training Program Goals and Concepts. The goal of acceleration training is to prepare aircrew and operational support flyers for high-G flight and enhance combat capability and safety by optimizing aircrew defense against G-induced Loss of Consciousness (GLOC). This goal is accomplished through education and practical experience. Instructors will teach physical conditioning, anti-G equipment, adequate G-oriented situational awareness, the physiology of high-G flight, and awareness of factors that affect an aircrew's G-tolerance. This manual addresses only the centrifuge training portion of the G awareness program. For information regarding continuation training requirements, see AFMAN 11-2F-16V1, *F-16 Pilot Training*, AFMAN 11-2F-15V1, *F-15 Aircrew Training*, AFMAN 11-2F-15EV1, *F-15E Aircrew Training*, AFMAN 11-2A/OA-10V1, *A/OA-10 Aircrew Training*, AFMAN 11-2T-38V1, *T-38 Aircrew Training*, AFMAN 11-2T-6V1, *T-6A Aircrew Training*, AFMAN 11-F-22V1, *F-22A Aircrew Training*, and AFMAN 11-2F-35V1, *F-35 Aircrew Training*. DELETED NOTE

1.3. (changed) Waiver Authority. Unless otherwise specified, 19th Air Force Director of Operations (19 AF/A3) is the waiver authority for the provisions of this manual. MAJCOM A3s may waive refresher centrifuge training for aircrew returning to operational aircraft based upon the risk assessment provided by the operational commander. MAJCOM A3s must coordinate waiver requests for formal course entry requirements if other MAJCOMs own the formal training course. Approved waivers will be posted in accordance with DAFMAN 90-161. Additionally, provide an info copy of granted waivers to 19 AF/A3OA Workflow email at AETC.AP.LeadCommand@us.af.mil, within 5 duty days of waiver completion.

1.4.1.1. (changed) Provides fiscal advocacy to AF personnel and training panels for planning, programming and budgeting requirements to support the Aerospace Physiology (AP) centrifuge training program.

1.4.2 (changed) Air Education and Training Command (AETC), 19th Air Force (19 AF). 19 AF/A3OA is the Lead Command for the AP acceleration training program, sets policy and guidance in accordance with AFI 11-200, *Aircrew Training, Standardization/Evaluation, and General Operations Structure*, and AFMAN 11-202 vol. 1, *Aircrew Training*. (**NOTE:** AETC/CC has delegated all Lead Command responsibilities to 19 AF/CC.)

1.4.2.1. (changed) 19 AF/A3OA develops and distributes courseware, as well as, incorporates 37 TRW, 711 HPW, and AF Safety Center mishap investigation and prevention information into AP acceleration courseware.

1.4.2.2. (changed) 19 AF/A3OA establishes criteria, conducts evaluations, and provides recommendations for acceptance of formal international aircrew AP acceleration training programs to the office of Air Force International Affairs (SAF/IA), Air Force Security Assistance Training (AFSAT), and AF/A3TH. 19 AF/A3OA coordinates with AF/A3TH to

recognize and accept non-USAF AP acceleration training programs for other US military services and DoD agencies who fly on USAF aircraft.

1.4.3. (added) **Managing Wings.** The following Wings manage the operations, logistics, and training encompassing the centrifuge device.

1.4.3.1 (changed) **711th Human Performance Wing (711 HPW).** The 711 HPW is responsible for the following.

1.4.3.1.1 (added) Oversees logistical support for the 711 HPW centrifuge provided via a human centrifuge maintenance service contract. Coordinates contract reviews and updates with 344 TRS Det 2 and associated personnel.

1.4.3.1.2. (added) Ensures proper quality assurance oversight of the contractor is maintained which must be reviewed and updated with 37 TRG and associated personnel. 711th Contracting Squadron has overall responsibility for the contract.

1.4.3.1.3. (added) In coordination with 19 AF/A3, advocates for centrifuge device requirements, maintenance, sustainment, and improvement through the Air Force Research Laboratory.

1.4.3.1.4. (added) Provides 19 AF/A3 an updated annual, per student, training cost.

1.4.3.2 (changed) **37th Training Wing (37 TRW).** The 37 TRW is responsible for the following.

1.4.3.2.1. (added) Executes the primary centrifuge training program and supports aircrew from multiple MAJCOMs and wings as well as ANG, AF Reserve units, and international aircrew.

1.4.3.2.2. (added) Provides logistical and fiscal support for the Acceleration Training Program.

1.4.3.2.3. (added) Provides registrar support for formal aircrew tracking in OTA.

1.4.3.2.4. (added) 344 TRS, Det 2 will execute centrifuge training in accordance with published 19 AF/A3 syllabus.

1.4.3.2.5 (added) Publishes and distributes an annual centrifuge training schedule to 19 AF/A3, Air Combat Command (ACC)/A3T, Air Force Personnel Center Rated Pipeline Assignments Section (AFPC/DP2ORC), and all Undergraduate Flying Training (UFT) base registrars.

1.4.4.1.1. (changed) Identify the Aerospace Physiology Training Program Manager in accordance with AFMAN 11-403, Aerospace Physiological Training Program. The Program Manager will:

1.4.5. (changed) **Air Force Career Field Managers (13HX and 1H0X1)**

1.4.5.1. (changed) The Career Field Managers will work with Headquarters Air Force (HAF)/A3 and AETC to ensure programmatic goals and directives are met.

1.4.5.2. (changed) The Career Field Managers in conjunction with the AFPC, will ensure that qualified Aerospace Physiologist and Aerospace Physiology personnel are assigned to conduct acceleration training.

1.4.6.1.1. (changed) Ensure Aerospace Physiology Training Units (APTUs) provide AGSM academic training and instruction with MDS-appropriate focus (e.g., aircrew flight equipment, oxygen regulator configuration). (T-2).

1.4.6.1.2. (changed) Ensure assigned 13HX and 1H0X1 personnel are trained in accordance with Air Force Specialty Code (AFSC) requirements. (T-2).

1.4.6.3. (changed) **APTU Flight Commander (or trained Air Force personnel at joint training sites or ANG/AFRC units).** APTU Flight Commanders will ensure that AP officers, fully qualified Aerospace Physiology technicians, or other AF personnel at joint training sites or ANG/AFRC units have been trained to execute acceleration training. **(T-2).**

2.2.2. (changed) **T-38 Special Training Requirements.** Pilots flying T-38 aircraft are required to complete Primary Acceleration Training (PAT) in accordance with [paragraph 2.3.1](#) unless excluded in the following situations: (1) aircrew that fly the T-38 aircraft only for landing currency, (2) aircrew that fly the T-38 for the Companion Trainer Program (CTP) if maneuvering is limited to less than 6.0 G, (3) or pilots in courses who will not continue flying USAF aircraft (e.g., USN Test Pilot School attendees). **(T-2).** Excepted aircrew are required to attend AGSM academic training conducted by a qualified AP officer, flight surgeon, Aerospace Physiology technicians or T-38 qualified IP and must be evaluated in the aircraft by a T-38 qualified IP. **(T-2).**

2.2.4. (changed) International aircrew flying USAF trainer or fighter aircraft who have met USAF centrifuge training standards as documented on the international program acceptance letter are not required to complete additional USAF centrifuge training. Documentation of international centrifuge training, including the profiles completed, peak G level, and date of training will be provided to local AP personnel for review and documentation on AF Form 1274, *Individual Physiological Training Record*; questions on international documentation will be referred to 19 AF/A3OA. International aircrew that have no prior centrifuge training, are noncurrent in centrifuge training, or trained in international centrifuge training programs with expired acceptance must retrain in accordance with this manual. All international Euro-North Atlantic Treaty Organization (NATO) Joint Jet Pilot Training (ENJJPT) Ips must meet acceleration training requirements in accordance with NATO Standardization Agreement (STANAG).

2.2.5 (changed) Passengers scheduled for flight aboard Type 1 and 2 aircraft will receive AGSM training conducted by a qualified AP officer, flight surgeon, or AP technician no earlier than 72 hours before flight. **(T-3).**

2.3.5. (changed) **Non-Pipeline Acceleration Training (NPAT).** Designed for all non-pipeline aircrew to include, but not limited, to US and foreign exchange aircrew, inter-service transfer aircrew, flight test engineers, flight surgeons, AP personnel, and other non-pipeline aircrew.

2.4.1 (changed) Authorized centrifuge training facilities are identified in the Education and Training Course Announcements (ETCA) site <https://usaf.dps.mil/teams/app10-etca/SitePages/home.aspx?isdlg=1>. See the ETCA for contact information for scheduling and reporting. ETCA contacts also support missing documentation requests.

2.4.2.1. (changed) Initiate requests for USAF acceptance of international acceleration training programs through the appropriate country manager who coordinates with 19 AF/A3OA to review the training program. Upon request from SAF/IA and/or AFSAT/RT, 19 AF/A3OA identifies the best-qualified AP personnel to review the requesting country's acceleration/centrifuge training program. Two-person teams, that at a minimum will consist of a field grade 13H3 and a 1H071, will complete an in-country approval visit after establishing courseware meets training standards. SAF/IA will prioritize and coordinate with AFSAT to fund country approval requests. 19 AF/A3OA will provide guidance and standardized evaluation checklists to the reviewer(s) to support this process. Courseware review is required for international acceleration training program recognition and will include written instructor guides, student study guides, and program completion requirements. The reviewer(s) will provide a written summary of their findings and recommendations to 19 AF/A3OA, who will then forward the recommendation and supporting documentation to 19 AF/A3 for approval of unconditional acceptance. Partner country programs training in centrifuge facilities adhering to NATO STANAG 3827 (Edition 5, 3 Sep 10 or more recent) may request expedited program acceptance via 19 AF/A3OA.

2.4.2.3. (changed) Acceptance of physiological training in accordance with AFMAN 11-403 does not immediately imply acceptance of a centrifuge training program. The acceptance trips may be combined, but each review functions separately to identify compliance with USAF training requirements.

2.7. (changed) Documentation of Training. A qualified Aerospace Physiology Officer assigned to centrifuge operations will document successful completion of centrifuge training. **(T-3).** Any Aerospace Physiology Officer can confirm centrifuge training if they obtain written/telephone verification of training date/type from the centrifuge training facility prior to documenting on the AF Form 1274.

2.7.2. (changed) **Documenting Formal Centrifuge Courses.** Use AF Form 1274 to document training directed by this publication. **(T-2).** A complete list of course codes can be found in **Table 2.1**. The 19 AF/A3OA can provide an example of a completed AF Form 1274 if needed. APTUs are not required to maintain copies of completed AF Forms 1274 but will maintain a record on students' centrifuge training performance for a period of 7 years, in accordance with AFRIMS Table 48, Rule 6, Note 214. **(T-2).** This list may be maintained using a locally developed database. Successful completion of centrifuge training for courses will be updated in OTA, as part of the USAF formal training tracking database. **(T-2).**

2.7.3. (changed) **Documenting Local Acceleration Training.** To document local acceleration training, use AF Form 1522, Aviation Resource Management System (ARMS) Additional

Training Accomplishment Report and the appropriate training codes obtained from aircrew records management personnel. (T-3). Examples include but are not limited to: AGSM refresher, HUD tape reviews, or other training. Since Acceleration training is documented via OTA by the registrar, APTUs are not required to maintain copies of completed AF Form 1522.

3.5 (changed) **Debrief.** Students will receive a thorough debrief following each training session by an AP centrifuge flight member, with emphasis on improving each student's AGSM. (T-2). The overall debrief will include a review of the aircrew's digital recording with emphasis on the AGSM, written review of AGSM performance documented on AF Form 4293, and, if warranted, a written recommendation to the aircrew for a tailored conditioning program designed to increase the individual's G-tolerance. (T-2).

3.6.1. (changed) **Notification.** The AP officer providing centrifuge training will notify the aircrew's squadron commander in writing/email of the failure and provide the commander a copy of the aircrew's training report and recommendations for improvement. AFPC/DP2ORC must be notified within 24 hours of all AAT and F-15E CSO failures. AFSAT/RT must be notified within 24 hours of all international student failures. (T-2). Schedule retraining within 60-180 days following the first attempt failure. (T-2).

3.6.3. (changed) **Restrictions.** There is no automatic restriction following a first attempt failure. Squadron commanders may opt to restrict aircrew from solo high-G operations until successful completion of centrifuge retraining. The squadron commander should review the centrifuge training record, consult with the flight surgeon, and an AP officer assigned to the centrifuge before restricting aircrew. Operations Group commanders determine a disposition of nonrated aircrew, operations support flyers, or any other individuals assigned aeronautical orders sent to centrifuge training in accordance with para 2.2 after their first attempt failure. (T-2).

3.6.6. (changed) Students must pass all profile training during repeat training attempts, regardless of a pass status of some runs during the first training session. (**NOTE:** Aerospace Medicine Primary, Aerospace Physiology Officer, Aerospace Physiology Technician course students may be considered for the second attempt within 60 days).

3.7.1. (changed) **Notification.** The AP officer providing centrifuge training will notify the aircrew's commander in writing/email and provide an information copy to 19 AF/A3OA of the aircrew's failure to complete retraining. (T-2). Notification must include the reasons for the failure and should include any recommendations that might be beneficial in determining the future training ability of the aircrew. (T-2). In addition, AFPC/DP2ORC must be notified within 24 hours of all AAT and F-15E CSO failures. (T-2). AFSAT/RT must be notified within 24 hours of all international student failures. (T-2).

5.3.1. (changed) The centrifuge training facility will maintain individual aircrew training records and recordings for 6 years according to AFI 33-322. This will serve as a back-up for flying unit records. (T-3).

5.4 (changed) Centrifuge Operations. Per [para 1.4.2.1.](#), AP Lead Command will review centrifuge training courseware prior to implementation into formal training and publish on the AETC Bookstore. <https://trss3.randolph.af.mil/Bookstore/home/homePage.aspx>.

5.4.1. (changed) **Centrifuge Crew Composition and Qualification.** The minimum centrifuge training crew will consist of an AP officer, lecturer, operator, and crew chief. **(T-2)**. A flight surgeon will be notified of centrifuge operations and placed on call in conjunction with emergency medicine notification. **(T-2)**. The on-call flight surgeon will be notified if emergency medical treatment is required. **(T-2)**. Flight Medicine or an appropriate emergency medicine transport team must provide patient transport to a medical treatment facility. **(T-3)**.

References

(changed) AFMAN 11-403, *Aerospace Physiological Training Program*, 13 August 2020

(changed) DAFMAN 90-161, *Publishing Processes and Procedures*, 15 April 2022

Abbreviations and Acronyms

(changed) AP – Aerospace Physiology

(changed) APTU – Aerospace Physiology Training Unit

Terms

(changed) **Type 1 and 2 personnel**—Any pilot, CSO, flight surgeon, AP personnel, student pilot in the fighter pipeline, other rated/nonrated aircrew, operational support flyer, or any other individuals assigned aeronautical orders assigned to an active flying billet or performing unrestricted flight in a Type 2 aircraft.

**BY ORDER OF THE SECRETARY
OF THE AIR FORCE**

AIR FORCE MANUAL 11-404

27 NOVEMBER 2019

Flying Operations

**FIGHTER AIRCREW
ACCELERATION TRAINING PROGRAM**



COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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This manual implements Air Force Policy Directive (AFPD) 11-4, *Aviation Service*. It establishes guidance and procedures for the acceleration training of regular Air Force (AF), Air National Guard (ANG), and Air Force Reserve Command (AFRC) aircrew and operational support flyers who are either currently flying or are selected to fly high-Gravity (G) aircraft. Forward publication change recommendations on AF Form 847, *Recommendation for Change of Publication*, through the appropriate functional chain of command. This publication may be supplemented at any level, but route all major command (MAJCOM)/direct reporting unit (DRU) supplements to 19th Air Force Aerospace and Operations Physiology Programs Branch (19 AF/DOA) for coordination prior to certification and approval. Field units below MAJCOM/DRU level forward copies of their supplements of this publication to their parent MAJCOM/DRU Office of Primary Responsibility (OPR) for coordination. The authorities to waive wing/unit level requirements in this publication are identified with a Tier (“T-0, T-1, T-2, T-3”) number following the compliance statement. See AFI 33-360, *Publications and Forms Management*, for a description of the authorities associated with the Tier numbers. Submit requests for waivers through the chain of command to the appropriate Tier waiver approval authority, or alternately, to the requestor’s commander for non-tiered compliance items. Additional waiver authority to this publication is described in [paragraph 1.3](#).

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Public Law 93-294, Aviation Career Incentive Act of 1974; DoD Instruction 7730.57, Aviation Incentive Pays and Continuation Bonus Program; and E.O. 9397 (SSN), as amended. The applicable System of Records Notices F044 AF SG H Air Force Aerospace Physiology Training Programs and F011 AF XO A Aviation Resource Management System (ARMS) are available at: <https://dpcl.d.defense.gov/privacy/SORNS.aspx>. Ensure all records created as a result of processes prescribed in this publication are maintained in accordance with Air Force Manual (AFMAN) 33-363, *Management of Records*, and disposed of in accordance with the Air Force Records Disposition Schedule located in the Air Force Records Information Management System (AFRIMS).

SUMMARY OF CHANGES

This document is substantially revised and must be completely reviewed. This revision changes the instruction to a manual and updates office symbols. Waiver/approval authorities have been added in accordance with AFI 33-360. Other changes include: re-designation of the F-35 to a Type 2 aircraft; refresher acceleration training requirements for Type I aircrew after 39 months in a non-flying billet; adds requirement for 711th Human Performance Wing (HPW) to provide registrar support to United States Air Force School of Aerospace Medicine (USAFSAM) for tracking aircrew training in Oracle Training Application (OTA); an Instructor Pilot (IP) who evaluates other aircrew members on their Anti-G Straining Maneuver (AGSM) must complete a minimum of academics on the physiology effects of G and the AGSM; USAF acceptance of United States Navy (USN) F-16 centrifuge training for Type 2 aircraft; added Wing Commander (CC) responsibility to appoint Fighter Aircrew Conditioning Program (FACP) instructors; removed FACP observer training requirement under the oversight of FACP instructors; removed centrifuge training profiles for Primary, Advanced, Refresher and Commander Directed Acceleration Training.

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Chapter 1

INTRODUCTION

1.1. General. This manual governs the Fighter Aircrew Acceleration Training Program, which teaches the physiological stresses of acceleration and aircrew flight equipment associated with modern high-G military aviation and prepares the trainee to meet these challenges. High-G aircraft are divided into two categories: Type 1 and Type 2. Reference the “Terms” section in [Attachment 1](#) for the definition of these categories.

1.2. Fighter Aircrew Acceleration Training Program Goals and Concepts. The goal of acceleration training is to prepare aircrew and operational support flyers for high-G flight and enhance combat capability and safety by optimizing aircrew defense against G-induced Loss of Consciousness (GLOC). This goal is accomplished through education and practical experience. Instructors will teach physical conditioning, anti-G equipment, adequate G-oriented situational awareness, the physiology of high-G flight, and awareness of factors that affect an aircrew's G-tolerance. This manual addresses only the centrifuge training portion of the G awareness program. For information regarding continuation training requirements, see AFMAN 11-2F-16V1, *F-16 Pilot Training*, AFMAN 11-2F-15V1, *F-15 Aircrew Training*, AFMAN 11-2F-15EV1, *F-15E Aircrew Training*, AFMAN 11-2A/OA-10V1, *A/OA-10 Aircrew Training*, AFMAN 11-2T-38V1, *T-38 Aircrew Training*, AFMAN 11-2T-6V1, *T-6A Aircrew Training*, AFMAN 11-F-22V1, *F-22A Aircrew Training*, and AFMAN 11-2F-35V1, *F-35 Aircrew Training*. (**NOTE:** All Mission Design Series (MDS) specific AFIs are converting to AFMANs)

1.2.1. Centrifuge training is a vital part of fighter aircrew acceleration training.

1.2.2. The centrifuge is the best platform for teaching the proper Anti-G Straining Maneuver (AGSM). Specifically, training shall:

1.2.2.1. Train and evaluate aircrew on a properly performed AGSM in a controlled environment.

1.2.2.2. Address strategies to improve aircrew performance under G-stress through the proper fit and use of protective equipment.

1.2.2.3. Identify aircrew with poor AGSM skill performance.

1.3. Waiver Authority. Unless otherwise specified, 19th Air Force Director of Operations (19 AF/DO) is the waiver authority for the provisions of this manual. MAJCOM A3s may waive refresher centrifuge training for aircrew returning to operational aircraft based upon the risk assessment provided by the operational commander. MAJCOM A3s must coordinate waiver requests for formal course entry requirements if other MAJCOMs own the formal training course. Approved waivers will be posted in accordance with AFI 33-360, *Publications and Forms Management*. Additionally, provide an info copy of granted waivers to 19 AF/DOA Workflow email at AETC.A3KF.AOPLeadCommand@us.af.mil, within 5 duty days of waiver completion.

1.4. Roles and Responsibilities.

1.4.1. Headquarters Air Force, Deputy Chief of Staff for Operations, Director of Training and Readiness (AF/A3T). AF/A3T manages and establishes guidance and policy for aircrew training as outlined in this manual to ensure compliance with Department of Defense (DoD) policy.

1.4.1.1. Provides fiscal advocacy to AF personnel and training panels for planning, programming and budgeting requirements to support the Aerospace and Operational Physiology (AOP) centrifuge training program.

1.4.1.2. Designates an AOP Aircrew Training Program Manager (TPM).

1.4.2. Air Education and Training Command (AETC), 19th Air Force (19 AF), Director of Operations (19 AF/DO). 19 AF/DO as the Lead Command for the AOP acceleration training program, sets policy and guidance in accordance with AFI 11-200, *Aircrew Training, Standardization/Evaluation, and General Operations Structure*, and AFMAN 11-202 vol. 1, *Aircrew Training*. (**NOTE:** AETC/CC has delegated all Lead Command responsibilities to 19 AF/CC.)

1.4.2.1. 19 AF/DO develops and distributes courseware, as well as, incorporates 711 HPW and AF Safety Center mishap investigation and prevention information into AOP acceleration courseware.

1.4.2.2. 19 AF/DO establishes criteria, conducts evaluations, and provides recommendations for acceptance of formal international aircrew AOP acceleration training programs to the office of Air Force International Affairs (SAF/IA), Air Force Security Assistance Training (AFSAT), and AF/A3TF. 19 AF/DOA coordinates with AF/A3TF to recognize and accept non-USAF AOP acceleration training programs for other US military services and DoD agencies who fly on USAF aircraft.

1.4.2.3. 19 AF/DO assesses the applicability, relevance, and effectiveness of the centrifuge training at each location. Ensures the centrifuge training program is in compliance with applicable directives.

1.4.2.4. 19 AF/DO processes all publication change requests.

1.4.3. The 711th Human Performance Wing (711 HPW). The 711 HPW executes the primary centrifuge training program and supports aircrew from multiple MAJCOMs and wings as well as ANG, AF Reserve units, and international aircrew. The 711 HPW is responsible for the following:

1.4.3.1. Provide logistical and fiscal support for the Acceleration Training Program.

1.4.3.2. Oversee logistical support for the 711 HPW centrifuge provided via a human centrifuge maintenance service contract. Coordinate contract reviews and updates with USAFSAM Aerospace & Operational Physiology (USAFSAM/FEP) and associated personnel.

1.4.3.3. Provide registrar support to the USAFSAM for formal aircrew tracking in OTA.

1.4.3.4. The USAFSAM ensures proper quality assurance oversight of the contractor is maintained which must be reviewed and updated with USAFSAM/FEP and associated personnel. 711th Contracting Squadron has overall responsibility for the contract.

1.4.3.5. In coordination with 19 AF/DO, advocate for centrifuge device requirements, maintenance, sustainment, and improvement through the Air Force Research Laboratory.

1.4.3.6. Publish and distribute an annual centrifuge training schedule to 19 AF/DO, Air Combat Command (ACC)/A3T, Air Force Personnel Center Rated Pipeline Assignments Section (AFPC/DP2ORC), and all Undergraduate Flying Training (UFT) base registrars.

1.4.3.7. Provide 19 AF/DOA an updated annual per student training cost.

1.4.3.8. USAFSAM/FEP will execute centrifuge training in accordance with published 19 AF/DO syllabus.

1.4.4. MAJCOMs/National Guard Bureau (NGB)/AFRC That Fly High-G Aircraft.

1.4.4.1. Director of Operations (A3 or equivalent).

1.4.4.1.1. Identify the Aerospace Physiology Training Program Manager in accordance with AFI 11-403, *Aerospace Physiological Training Program*. The Program Manager will:

1.4.4.1.1.1. Conduct annual reviews of MDS-specific acceleration training to ensure relevancy to aircrew in the MDS and provide findings to 19 AF/DOA. (**NOTE:** 19 AF/DOA will accomplish this on behalf of the Air Reserve Component)

1.4.4.1.1.2. Provide updates to 19 AF/DOA resulting from Aircrew Protection Working Group meetings on any aircrew flight equipment and protective ensembles.

1.4.4.1.1.3. Participate in realistic training review boards as required.

1.4.4.1.1.4. Assess applicability/effectiveness of operational aspects of training with applicable AFI/AFMANs using a checklist made available by AF/A3TF no less than biannually.

1.4.4.2. Director of Operational Capability Requirements (A5 or A8).

1.4.4.2.1. Ensure MDS or Aircrew Flight Equipment (AFE) acquisitions, modifications, or upgrades that affect G performance are coordinated with 19 AF/DOA for a review into acceleration training courseware. This review includes, but should not be limited to, courseware and training systems to ensure courses address MDS-specific physiological, human factors, and emergency procedure training requirements.

1.4.4.2.2. Coordinate with 711 HPW for programming required to acquire or modify existing centrifuge training systems to meet unique requirements as a result of new MDS or Aircrew Flight Equipment acquisitions/modifications/upgrades.

1.4.4.2.3. Program for development of acceleration training courseware specific to new, modified, or upgraded MDS and equipment during the acquisition process.

1.4.5. Associate Corps Chief for Aerospace Physiology

1.4.5.1. As the military consultant for Aerospace & Operational Physiology, the Associate Corps Chief will work with Headquarters Air Force (HAF)/A3 and AETC to ensure programmatic goals and directives are met.

1.4.5.2. The Associate Corps Chief, in conjunction with the AFPC, will ensure that qualified AOP personnel are assigned to conduct acceleration training.

1.4.6. Wing Commander. Wing Commanders of UFT and Combat Air Force Formal Training Units (FTU) will appoint an instructor for the FACP in accordance with requirements in this guidance. **(T-2).**

1.4.6.1. Operations Group Commander.

1.4.6.1.1. Ensure Aerospace and Operational Physiology Training Units (AOPTUs) provide AGSM academic training and instruction with MDS-appropriate focus (e.g., aircrew flight equipment, oxygen regulator configuration). **(T-2).**

1.4.6.1.2. Ensure assigned 43A and 4M0 personnel are trained in accordance with Air Force Specialty Code (AFSC) requirements. **(T-2).**

1.4.6.2. Flying Squadron Commanders.

1.4.6.2.1. Work closely with FACP instructors (or trained Air Force personnel at joint training sites or ANG/AFRC units) to identify those students that may need improved G-fitness. **(T-2).** **(NOTE:** This responsibility may be delegated to flight commanders. Several factors may be used to determine that a student needs improved G-fitness, including: inadequate AGSM performance in the aircraft, evidence of poor physical fitness, and indicators of AGSM error noted during Heads Up Display (HUD) tape reviews)

1.4.6.2.2. Request individualized G-fitness training programs for flying training students (as needed) from the FACP Instructor (or trained Air Force personnel at joint training sites or ANG/AFRC units) when appropriate. **(T-3).** For instance, a student demonstrates early physical fatigue or difficulty in executing an effective AGSM.

1.4.6.2.3. Ensure FACP Instructors execute training in accordance with the undergraduate/graduate flight training syllabi. **(T-3).**

1.4.6.3. AOPTU Flight Commander (or trained Air Force personnel at joint training sites or ANG/AFRC units). AOPTU Flight Commanders will ensure that AOP officers, fully qualified technicians, or other AF personnel at joint training sites or ANG/AFRC units have been trained to execute acceleration training. **(T-2).**

1.4.6.4. Flying Training Instructors.

1.4.6.4.1. Ensure students execute the prescribed fitness program that targets G-performance, as determined by the FACP instructor after the education phase. **(T-3).**

1.4.6.4.2. Ensure students track progress toward improved G-fitness during an advanced phase or until the student track-selects to a low-G aircraft. **(T-3).** Assessments and exercise sessions may be documented in the student training folder.

1.4.6.4.3. Ensure students participate in at least three exercise sessions per week that include exercises to improve high-G fitness and execution of the AGSM. **(T-3).**

1.4.6.4.4. Ensure that during the FACP self-assessment, students wear Air Force Physical Training (PT) gear or unit-specific PT gear. **(T-3).**

Chapter 2

ACCELERATION TRAINING REQUIREMENTS

2.1. Personnel Requiring Acceleration Training. Manned high-G aircraft flight is considered particularly high risk because of the inability of the operator to sustain consciousness during some flight maneuvers. Rated aircrew and other flyers exposed to high-G flight require acceleration training to reduce risk of GLOC by increasing individual awareness of personal limitations, to reduce the probability and potential for this element of human factors mishaps and increase safety measures across the USAF.

2.2. Personnel Requiring Centrifuge Training. All USAF rated aircrew assigned to high-G aircraft are required to successfully complete centrifuge training **(T-1)**. For aviators assigned to a flying billet in Type 1 or Type 2 aircraft, centrifuge training is required to ensure ability to perform effective AGSM. IPs who evaluate other aircrew on AGSM ability must receive, at a minimum, academic instruction on the physiological effects of G and the AGSM. **(T-2)**. Operations Group Commanders will determine centrifuge requirements for any nonrated aircrew, operations support flyers, or any other individuals assigned aeronautical orders participating in high-G flight based on the individual's duties and anticipated G exposure. **(T-2)**.

2.2.1. Following centrifuge training, students will not perform aircrew duties for 12 hours unless cleared by a flight surgeon. **(T-3)**.

2.2.2. **T-38 Special Training Requirements.** Pilots flying T-38 aircraft are required to complete Primary Acceleration Training (PAT) in accordance with [paragraph 2.3.1](#) unless excluded in the following situations: (1) aircrew that fly the T-38 aircraft only for landing currency, (2) aircrew that fly the T-38 for the Companion Trainer Program (CTP) if maneuvering is limited to less than 6.0 G, (3) or pilots in courses who will not continue flying USAF aircraft (e.g., USN Test Pilot School attendees). **(T-2)**. Excepted aircrew are required to attend AGSM academic training conducted by a qualified AOP officer, flight surgeon, or T-38 qualified IP and must be evaluated in the aircraft by a T-38 qualified IP. **(T-2)**.

2.2.3. Unless accepted in [2.2.2](#) any US Navy, US Army, US Marine Corps, or US Coast Guard rated aircrew member who has completed USN F-18 centrifuge training and will perform flight duties in USAF Type 1 aircraft must complete USAF PAT. **(T-2)**. USAF accepts USN F-16 centrifuge training for Type 2 aircraft.

2.2.4. International aircrew flying USAF trainer or fighter aircraft who have met USAF centrifuge training standards as documented on the international program acceptance letter are not required to complete additional USAF centrifuge training. Documentation of international centrifuge training, including the profiles completed, peak G level, and date of training will be provided to local AOP personnel for review and documentation on AF Form 1274, *Individual Physiological Training Record*; questions on international documentation will be referred to 19 AF/DOA. International aircrew that have no prior centrifuge training, are noncurrent in centrifuge training, or trained in international centrifuge training programs with expired acceptance must retrain in accordance with this manual. All international Euro-North Atlantic Treaty Organization (NATO) Joint Jet Pilot Training (ENJJPT) IPs must meet acceleration training requirements in accordance with NATO Standardization Agreement (STANAG).

2.2.5. Passengers scheduled for flight aboard Type 1 and 2 aircraft will receive AGSM training conducted by a qualified AOP officer or flight surgeon no earlier than 72 hours before flight. **(T-3).**

2.2.6. Due to a risk of injury, any request for centrifuge training that is not required as part of a formal AFSC awarding course must be approved by the requesting member's group commander. **(T-2).**

2.3. Centrifuge Training Courses.

2.3.1. **Primary Acceleration Training.** PAT prepares aircrew for Type 1 high-G flight. PAT is normally conducted between the primary (T-6/T-34) and advanced (T-38) phases in Undergraduate Pilot Training (UPT) and ENJJPT for pipeline students. PAT may occur prior to the completion of primary flight training. All students must complete PAT before flying solo in the T-38. **(T-2).** Pipeline F-15E Combat Systems Officers (CSO) will receive this training after completion of CSO training and before the first flight of Introduction to Fighter Fundamentals (IFF). **(T-2).** Successful completion of PAT is a prerequisite for entry into the A-10 and F-15E FTUs courses **(T-1).** Previous completion of PAT is sufficient to meet this requirement. For example, former F-15E CSOs who have previously passed 7.5 G Training or PAT, and are now a student in UPT, are not required to complete PAT a second time. Additionally, pilots reporting to Type 1 training outside of Specialized Undergraduate Pilot Training/CSO pipeline must complete PAT training (e.g., C-17 pilot enrolled in Test Pilot School (TPS) who will fly T-38 in TPS).

2.3.2. **Advanced Acceleration Training (AAT).** AAT is designed to illustrate differences in Type 1 and Type 2 flight. Aircrew with previous PAT completion selected for, or transitioning to F-15C, F-16, F-22 or F-35 aircraft will attend AAT. Successful completion of AAT is a prerequisite for entry into the F-15C, F-16, F-22 and F-35 FTU courses. Students must successfully complete AAT prior to the first flight at FTU. **(T-2).**

2.3.3. **Refresher Acceleration Training (RAT).** RAT is designed for aircrew who previously completed PAT or AAT and who are returning to Type 1 or Type 2 aircraft after more than 39 months in a non-flying billet. Aircrew qualified in Type 1 aircraft and are returning to Type 1 after more than 39 months in a non-High G aircraft or non-flying billet are required to complete Type 1 RAT. **(T-2).** Aircrew who are qualified in Type 2 aircraft and are returning to Type 2 after more than 39 months in a non-High G aircraft or non-flying billet are required to complete Type 2 RAT. **(T-2).** Aircrew separating from the Air Force or retiring within 90 days (6 months for ANG aircrew) are not required to complete refresher training.

2.3.4. **Commander-Directed Acceleration Training (CDAT).** This action is available to commanders at all levels to address an aircrew's specific AGSM technique problems or to build G-confidence in an aircrew's AGSM. It can be scheduled at any point in an aircrew member's career to include while in training courses.

2.3.5. **Non-Pipeline Acceleration Training (NPAT).** Designed for all non-pipeline aircrew to include, but not limited to, US and foreign exchange aircrew, inter-service transfer aircrew, flight test engineers, flight surgeons, AOP personnel, and other non-pipeline aircrew.

2.3.5.1. Non-pipeline aircrew requiring centrifuge training for an aircraft other than F-15C, F-16, F-22, or F-35 will attend PAT. **(T-2).**

2.3.5.2. Non-pipeline aircrew requiring centrifuge training for Type 2 aircraft may complete an AAT profile without first completing PAT; however, these aircrew must receive the platform academics associated with PAT. (T-2).

2.4. Authorized Centrifuge Training Facilities.

2.4.1. Authorized centrifuge training facilities are identified in the Education and Training Course Announcements (ETCA) site <https://app10-eis.aetc.af.mil/etca/SitePages/Home.aspx>. See the ETCA for contact information for scheduling and reporting. ETCA contacts also support missing documentation requests.

2.4.2. **International Centrifuge Training Facilities.** 19 AF/DOA maintains a list of international acceleration training programs providing centrifuge training meeting USAF requirements.

2.4.2.1. Initiate requests for USAF acceptance of international acceleration training programs through the appropriate country manager who coordinates with 19 AF/DOA to review the training program. Upon request from SAF/IA and/or AFSAT/RT, 19 AF/DOA identifies the best-qualified AOP personnel to review the requesting country's acceleration/centrifuge training program. Two-person teams, that at a minimum will consist of a field grade 43A3 and may include a 4M071, will complete an in-country approval visit after courseware meets training standards. SAF/IA will prioritize and coordinate with AFSAT to fund country approval requests. 19 AF/DOA will provide guidance and standardized evaluation checklists to the reviewer(s) to support this process. Courseware review is required for international acceleration training program recognition and will include written instructor guides, student study guides, and program completion requirements. The reviewer(s) will provide a written summary of their findings and recommendations to 19 AF/DOA, who will then forward the recommendation and supporting documentation to 19 AF/DO for approval of unconditional acceptance. Partner country programs training in centrifuge facilities adhering to NATO STANAG 3827 (Edition 5, 3 Sep 10 or more recent) may request expedited program acceptance via 19 AF/DOA.

2.4.2.2. Accepted international centrifuge training programs must be reviewed every 5 years via the above mentioned coordination process. If program certification has lapsed, 19 AF/DOA will coordinate the re-certification process and may require a site visit. Re-certification may be accomplished via courseware review only if personnel are not able to evaluate in-country.

2.4.2.3. Acceptance of physiological training in accordance with AFI 11-403 does not immediately imply acceptance of a centrifuge training program. The acceptance trips may be combined, but each review functions separately to identify compliance with USAF training requirements.

2.5. Scheduling and Travel Arrangements.

2.5.1. Details for scheduling acceleration training are found in the ETCA. AFPC, ANG, and AFRC fill AAT training quotas for their fighter training pipeline aviators.

2.5.2. Foreign Military Sales (FMS) training will be scheduled through the respective country managers, in coordination with the scheduling office (quota managers) at the Air Force Security Assistance Training Squadron, JBSA- Randolph, Texas. Any additional requirements for international students outside of training provided (i.e. transportation, lodging, etc.) will be the responsibility of the International Military Student Office at the centrifuge training location. (T-3).

2.5.3. AFPC/DP2ORC will assign a training line number for the aircrew member to attend AAT training. Travel orders will be processed by the student's Military Personnel Flight (MPF) Formal Training Section. (T-3). USAFSAM/FEPA will schedule students for PAT, RAT, and NPAT as required. (T-3). Aircrews are grounded on the 181st day following their first attempt at their required centrifuge training until the satisfactory completion of retraining or MAJCOM/A3 or NGB/A3 waiver is approved. (T-2).

2.6. Documentation Required to Receive Centrifuge Training. All students must bring a current DD Form 2992, *Medical Recommendation for Flying or Special Operational Duty*, or service/country equivalent, indicating the individual is medically cleared by a qualified flight surgeon or aeromedical examiner. (T-1). If students are not medically cleared for flight or special operational duty, they will not be allowed to participate in centrifuge training and should be rescheduled by USAFSAM/FEPA. (T-1).

2.7. Documentation of Training. A qualified Aerospace and Operational Physiology Officer assigned to centrifuge operations will document successful completion of centrifuge training. (T-3). Any Aerospace and Operational Physiology Officer can confirm centrifuge training if they obtain written/telephone verification of training date/type from the centrifuge training facility prior to documenting on the AF Form 1274.

2.7.1. AF Form 4293, *Student Activity Record*. This form documents evaluations of AGSM performance. (T-3). Students must ensure a copy of the AF Form 4293 goes into their flying training grade book upon return from centrifuge training. (T-3). Students must ensure all copies of their AF Form 4293 get properly filed at all FTU courses that are attended. (T-3). The member's squadron commander or equivalent requests replacement of misplaced forms. (T-3).

2.7.2. **Documenting Formal Centrifuge Courses.** Use AF Form 1274 to document training directed by this publication. (T-2). A complete list of course codes can be found in [Table 2.1](#). The 19 AF/DOA can provide an example of a completed AF Form 1274 if needed. AOPTUs are not required to maintain copies of completed AF Forms 1274 but will maintain a record on students' centrifuge training performance for a period of 7 years, in accordance with AFRIMS Table 48, Rule 6, Note 214. (T-2). This list may be maintained using a locally developed database. Successful completion of centrifuge training for courses will be updated in OTA, as part of the USAF formal training tracking database. (T-2).

2.7.3. **Documenting Local Acceleration Training.** To document local acceleration training, use AF Form 1522, *Aviation Resource Management System (ARMS) Additional Training Accomplishment Report* and the appropriate training codes obtained from aircrew records management personnel. (T-3). Examples include but are not limited to: AGSM refresher, HUD tape reviews, or other training. AOPTUs are not required to maintain copies of completed AF Form 1522.

Table 2.1. Aerospace Physiology Training Task ID codes.

Formal Course ID	Training Course
S-O-B/A-APC-P	Initial Centrifuge (Primary Acceleration Training)
S-O-B/A-APC-A	Qualification Centrifuge (Advanced Acceleration Training)
S-O-B/A-APC-R	Refresher Centrifuge (Refresher Acceleration Training)
S-O-B/A-APC-C	Commander Directed Centrifuge Acceleration Training
S-O-B/A-APC-O	Other Centrifuge (Foreign exchange, inter-service, non-pipeline)

Chapter 3

ACCELERATION TRAINING CONTENT

3.1. Requirements. Completion of all training prescribed by this chapter is required. (T-1). Acceleration training academics are required on a recurrent basis by all aircrew and ops support flyers (T-2). Centrifuge training may not be required on a recurrent basis for aircrew members that retain flying currency. All trainees are required to present proof of current USAF or service equivalent flight physical (e.g., DD Form 2992). (T-1).

3.2. Acceleration Training Academics. Fundamental acceleration academics are provided during pipeline/FTU training; these requirements are established in the appropriate syllabus for each MDS and are tracked via student gradebooks/databases. Additionally, each MDS has refresher training requirements for AGSM; regular HUD tape reviews are accomplished at the local level (T-3). Reference the MDS publication series in [Attachment 1](#) for information on frequency and authorized trainers.

3.3. Centrifuge Academic Instruction and Profiles. Platform academic instruction covers the physiological effects of acceleration forces, characteristics of GLOC, techniques of an effective AGSM, mishap lessons learned, and protection offered by current and future anti-G systems. (T-2). Also, instructors will discuss the impact of physical conditioning, lifestyle, proper nutrition, and situational awareness on individual G-tolerance and on the effectiveness of the AGSM in accordance with techniques discussed in AF Pamphlet (AFPAM) 11-419, *G-Awareness for Aircrew*. (T-3). All aircrew will accomplish the training in accordance with 19 AF/DOA courseware. (T-2).

3.4. Grading Criteria. The student is expected to demonstrate AGSM skill and proficiency at the centrifuge training facility (T-2). The grading is on a pass/fail basis. Pass is assigned when the student makes only minor AGSM performance errors that do not impact overall AGSM effectiveness. Fail is assigned when AGSM performance indicates a significant lack of muscular strength, endurance, technical ability, and/or knowledge. Students who do not successfully complete the first centrifuge training session may be retained for up to 3 working days. If AGSM performance has not progressed to passing criteria after 3 working days, the student will be assigned a failing grade. (T-2). AF Forms 4293 will document the student's grades and will be used as part of the debrief process for each student. (T-2).

3.5. Debrief. Students will receive a thorough debrief following each training session by an AOP centrifuge flight member, with emphasis on improving each student's AGSM. (T-2). The overall debrief will include a review of the aircrew's digital recording with emphasis on the AGSM, written review of AGSM performance documented on AF Form 4293, and, if warranted, a written recommendation to the aircrew for a tailored conditioning program designed to increase the individual's G-tolerance. (T-2).

3.6. Non-completion of training: First Attempt Failure.

3.6.1. **Notification.** The AOP officer providing centrifuge training will notify the aircrew's squadron commander in writing/email of the failure and provide the commander a copy of the aircrew's training report and recommendations for improvement. AFPC/DP2ORC must be notified within 24 hours of all AAT and F-15E CSO failures. AFSAT/RT must be notified within 24 hours of all international student failures. **(T-2)**. Schedule retraining within 60-180 days following the first attempt failure. **(T-2)**.

3.6.2. **Grounding.** Aircrew members are not medically grounded following a failed first attempt beyond the recommendation to not fly as an aircrew member for 12-hours following centrifuge training.

3.6.3. **Restrictions.** There is no automatic restriction following a first attempt failure. Squadron commanders may opt to restrict aircrew from solo high-G operations until successful completion of centrifuge retraining. The squadron commander should review the centrifuge training record, consult with the flight surgeon, and an AOP officer assigned to the centrifuge before restricting aircrew. Operations Group commanders determine a disposition of nonrated aircrew, operations support flyers, or any other individuals assigned aeronautical orders sent to centrifuge training in accordance with [para 2.2](#) after their first attempt failure. **(T-2)**.

3.6.4. **Conditioning program.** The student's commander or commander-designated representative will monitor the student's progress in any physical conditioning program. **(T-3)**. Student must be afforded sufficient opportunity to work on their individual conditioning program in accordance with AF fitness guidance. Students should seek out local exercise physiology expertise from a FACP Instructor and/or a Health and Wellness Center personal trainer (see [para 4.5.2](#)) if physical conditioning was recognized as a weakness during acceleration training. The commander and flight surgeon will review the aircrew's progress in the conditioning program before scheduling retraining. **(T-3)**.

3.6.5. **Second Attempt Training.** Will be scheduled no earlier than 60 days following the student's first attempt failure. **(T-3)**. This program will be scheduled directly through USAFSAM/FEPA, is 1-3 days in duration, and consists of the following:

3.6.5.1. Review of digital recording and training report from the first training attempt.

3.6.5.2. Review of progress made during individual conditioning program.

3.6.5.3. Academics tailored to the individual's original problem areas.

3.6.5.4. At a minimum, successful completion of required G-training profile in accordance with 19 AF courseware.

3.6.6. Students must pass all profile training during repeat training attempts, regardless of a pass status of some runs during the first training session. **(NOTE:** Aerospace Medicine Primary and Aerospace and Operational Physiology Officer course students may be considered for the second attempt within 60 days when training is accomplished at the Wright-Patterson AFB centrifuge).

3.7. Non-Completion of Training: Second Attempt Failure.

3.7.1. **Notification.** The AOP officer providing centrifuge training will notify the aircrew's commander in writing/email and provide an information copy to 19 AF/DOA of the aircrew's failure to complete retraining. (T-2). Notification must include the reasons for the failure and should include any recommendations that might be beneficial in determining the future training ability of the aircrew. (T-2). In addition, AFPC/DP2ORC must be notified within 24 hours of all AAT and F-15E CSO failures. (T-2). AFSAT/RT must be notified within 24 hours of all international student failures. (T-2).

3.7.2. **Grounding and medical evaluation.** Aircrew members are medically grounded pending completion of a medical evaluation by a qualified flight surgeon. (T-1). The flight surgeon will determine if there is any underlying pathology that caused or contributed to the failure to complete training. The flight surgeon will provide the results of this evaluation to the unit commander and the MAJCOM Chief Aerospace Medicine (SGP) or equivalent. (T-2). Following satisfactory completion of treatment (if underlying pathology is a factor), recommendation by the attending flight surgeon, and concurrence by the MAJCOM/SGP or equivalent, the aircrew may reattempt without prejudice. If no underlying pathology was discovered, then the remaining procedures in this section will be implemented.

3.7.3. **Aircrew Disposition.** Aircrew who have failed a second attempt will undergo an operational review to determine their final disposition. (T-3).

3.7.3.1. The aircrew's OG/CC or equivalent will conduct a unit-level operational review. (T-2). The purpose of this review is to provide a recommendation to the MAJCOM/A3 or equivalent as to whether a qualified aircrew member should receive a waiver to continue in their aircraft. The OG/CC must consider the aircrew's flying skill and experience, and then determine the aircrew's potential to develop into a successful high-G aviator.

3.7.3.2. The owning MAJCOM determines disposition of UPT students that fail a second attempt to complete training. (T-2).

Chapter 4

FIGHTER AIRCREW CONDITIONING PROGRAM

4.1. Overview Description and Goals

4.1.1. **Description and Goals.** Physical fitness is important for optimizing flying performance in high-G aircraft. Specifically, anaerobic capacity and endurance play an important part in executing an effective AGSM. Several other elements also play a role in G-performance, creating the need for a comprehensive training program that covers all elements. FACP implements targeted fitness early in the undergraduate pipeline with an emphasis on high-G fitness to enable lifelong G tolerance. FACP provides education to all AETC UFT, IFF, fighter Pilot Instructor Training (PIT) and FTU courses on high-G fitness.

4.1.2. The goal of the FACP is to improve the high-G fitness and execution of the AGSM for fighter aircrew members and establish effective physical conditioning habits for all aircrew. Conditioning should be specific to the duration and demands of the high-G environment. UFT students will complete an observed self-assessment by FACP instructors. (T-2).

4.2. Scheduling and Participating in Fitness Training

4.2.1. UFT students must receive FACP education during the preflight phase. (T-3). Students in Type 1 aircraft will continue to participate in FACP throughout the duration of UFT. (T-3).

4.2.2. All students in T-6/T-38 PIT, IFF, and fighter FTU, FTU upgrading IP, and transition/requalification training must participate in FACP education. Self-assessments are only required for UFT students. Students who are reassigned to Type 2 aircraft following a non-flying assignment or who are converting from a Type 1 aircraft will also receive FACP education during transition training, including senior officers (O-6 and above). (T-3).

4.2.3. For joint service and international students in Air Force training programs, participation in FACP is highly encouraged.

4.3. Education Phase

4.3.1. Classroom Academics

4.3.1.1. **High-G Fitness Academics.** FACP instructors will provide academic instruction to execute an effective fitness and conditioning program throughout the student's flying career to enhance their physical performance in the high-G environment. (T-3).

4.3.1.1.1. Fitness for G-performance requires several fitness elements, including anaerobic (muscle strength and endurance) fitness, aerobic fitness, flexibility, and balance/stability. Additionally, neck stretching and strengthening, as well as injury mitigation strategies, will be part of this comprehensive approach. Proper form will be emphasized for all exercises. Safety will always be the top priority.

4.3.1.1.2. Anaerobic fitness is essential to performing an effective AGSM while minimizing muscular fatigue. In particular, core (abdominal and lower back) and lower body muscle (glutes and legs) tensing is critical to prevent G-related blood pooling and loss of blood pressure to the brain. Exercises that build strength and endurance for those muscle groups will be a major focus of the FACP. The principles of warm-up, split training, and periodicity (cycling of weight/reps/sets) should be an integral part of FACP.

4.3.1.1.3. Aerobic fitness (cardiovascular efficiency) increases blood supply to the working muscles which significantly reduces recovery time between engagements and sorties. Aerobic conditioning should be carefully matched to the duration and intensity of the high-G environment. Higher intensity/shorter duration aerobic training should be emphasized as most appropriate for preparing students for the high-G environment. Lower intensity/longer duration aerobic training is also appropriate for longer-term health.

4.3.1.1.4. **Other Training Aspects.** Flexibility refers to the degree to which a joint moves through a normal, pain-free range of motion. Flexibility may contribute to a successful AGSM and reduce the risk of injuries. Decreased flexibility, may reduce physical performance and increase injury risk during flight maneuvers. Balance/stability may be improved by exercising muscles deep within the abdomen and back attaching to the spine or pelvis. Many movements originate at these muscles and form the source of an individual's stability. Training for stability involves training the body as a whole versus separate muscle groups. Exercises that improve balance and stability may contribute to a better AGSM and prevent short and long-term injuries that tend to result from the demands of high-G sorties. Balance/stability exercises may be accomplished while seated on stable or unstable devices and adding lateral, posterior, and anterior forces to simulate acceleration forces. Finally, FACP instructors will provide students with the knowledge necessary to reduce or prevent neck injuries through proper stretching and strengthening.

4.3.2. **FACP Assessments**

4.3.2.1. **Exercise.** FACP instructors will have oversight of demonstrated proper fitness techniques and specific exercises the student can perform to optimize high-G physical performance. FACP instructors will offer students variations of exercises for each applicable muscle area. **(T-3).**

4.3.2.1.1. The intent of the FACP assessment is to target high-G physical performance standards for student fitness improvement, not to establish pass/fail requirements.

4.3.2.2. **Observed Self-Assessments.** FACP observers or instructors will oversee students' self-assessments as they complete the demonstrated exercises. **(T-3).** In the absence of validated research on which exercise activities improve G performance, the selected exercises were included for their demonstrated improvement in affected muscle groups. Instructors will focus on individualized recommendations to improve student fitness. An acceptable FACP assessment *does not* guarantee acceptable performance in the G environment. High-G aircrews must consider the wide range of personal physiological factors and apply sound judgment in determining personal capabilities on any given day or sortie. **(T-3).**

4.3.2.3. Instructors may incorporate AF Fitness Assessment results as part of the individualized recommendations, if appropriate.

4.3.2.4. To reduce the risk for injuries, FACP instructors will emphasize the need for a quality warm-up prior to the exercise. (T-3).

4.4. Documentation

4.4.1. The student's FACP participation during UFT will be tracked in the appropriate student-tracking database, such as the Graduate Training Integration Management System. (T-3).

4.4.2. **Individual Counseling.** FACP instructors who determine that a student needs additional fitness monitoring (based on HUD tape reviews, or inadequate G-performance in the aircraft) may counsel and schedule students for additional observed fitness self-assessments.

4.5. FACP Instructor Qualification and Training. Courses listed in [para 4.5.1](#) provide the skills and knowledge of individuals to provide exercise education and assessment. Supervisors should evaluate training recency during their assessment of instructor cadre.

4.5.1. Required, FACP instructor training consists of at least one of the following: National Strength and Conditioning Association's Certified Strength and Conditioning Specialist Course, American College of Sports Medicine's Certified Health Fitness Specialist Course or other specified courseware provided by 19 AF/DOA. These courses prepare new instructors to direct FACP self-assessments. FACP observers will complete the Physical Training Leader (PTL) course where available and maintain Heart Saver/Basic Life Support (BLS) certification. (T-2). FACP academic instructors will meet the observer criteria, maintain an academic evaluation by a qualified instructor trainer, and attend any instructor continuing education sessions scheduled by the local Instructor Trainer. (T-2).

4.5.1.1. Document this training in the FACP instructor's training records. (T-2). Any of the courses/certifications identified in [para 4.5.1](#) fulfill this training requirement. Wings will ensure adequate resourcing of travel, supplies, and related costs necessary to qualify personnel to conduct FACP training. (T-3).

4.5.1.2. **FACP instructors.** Educate students per syllabus requirements. (T-2). FACP instructors may demonstrate a variety of exercises to ensure students understand proper form, split training options (using more than one exercise per muscle group), and variety to discourage stagnation and ensure conditioning progress. Students will then demonstrate the effective performance of each exercise following a warm-up period. (T-2).

4.5.2. **Instructor Trainer.** Qualified instructors who have demonstrated professional growth above the minimum requirements may complete additional training to serve as an instructor trainer. Instructor trainers ensure training standardization and that there are enough qualified basic instructors to effectively observe student self-assessments.

4.5.2.1. **Academic Degree Criteria.** A specific academic degree is not a prerequisite for instructor trainer designation. Academic achievement is highly encouraged and denotes achievements that exceed minimum requirements.

4.5.2.2. **Instructional Skills Assessment.** Instructor trainers will evaluate the basic instructor's presentation delivery, academic counseling, and other skills required for the FACP. The supervisor will use the assessment to determine if any additional training or experience is necessary. The supervisor will document the assessment as part of the local instructor assessment program. **(T-3).**

Chapter 5

PROGRAM ADMINISTRATION AND DEVICE MANAGEMENT

5.1. Program Administration Overview. The centrifuge training facility will provide an end-of-calendar year report to 19 AF/DOA which delineates the following (with anonymity):

5.1.1. The number of individuals by MDS and crew position who attended training categorized by training program (e.g., PAT, AAT, RAT). (T-3).

5.1.2. The number of failures and failure rate by training program, MDS, and crew position. (T-3).

5.1.3. Injuries or medical problems associated with training, by aircrew MDS. (T-3).

5.1.4. Synopsis of critique comments. Only include comments directed at the overall program or policies. Comments on the facility or its personnel need not be sent forward. (T-3).

5.1.5. Specific comments or recommendations by the facility chief regarding program policy or procedures. (T-3).

5.2. Digital Recording Disposition. Formal requests for a release of student recordings require permission from 19 AF/DO or ANG/A3O as appropriate. The centrifuge facility may provide students copies of their own training. These reports are Controlled Unclassified Information afforded protection from unauthorized disclosure.

5.3. Individual Records. Flying units will track qualification centrifuge training in ARMS and in individual flight records in accordance with AFMAN 11-421, *Aviation Resource Management*. (T-2).

5.3.1. The centrifuge training facility will maintain individual aircrew training records and recordings for 6 years according to AFMAN 33-363. This will serve as a back-up for flying unit records. (T-3).

5.3.2. The training reports maintained by the centrifuge facility may be released to the aircrew's commander, MAJCOM/A3, MAJCOM/SE (Chief of Safety) or MAJCOM/SGP (ANG/A3O/SGP for ANG aircrew). Requests for a release of individual training reports to other agencies must be approved by the MAJCOM/A3T or ANG/A3O. (T-2). These reports are Controlled Unclassified Information and are afforded protection from unauthorized disclosure.

5.4. Centrifuge Operations. Per [para 1.4.2.1.](#), AOP Lead Command will review centrifuge training courseware prior to implementation into formal training and publish on the AETC Bookstore. <https://trss3.randolph.af.mil/Bookstore/home/homePage.aspx>

5.4.1. **Centrifuge Crew Composition and Qualification.** The minimum centrifuge training crew will consist of an AOP officer, lecturer, operator, and crew chief. (T-2). A flight surgeon will be notified of centrifuge operations and placed on call in conjunction with emergency medicine notification. (T-2). The on-call flight surgeon will be notified if emergency medical treatment is required. (T-2). Flight Medicine or an appropriate emergency medicine transport team must provide patient transport to a medical treatment facility. (T-3).

5.4.2. 711 HPW will establish qualification criteria and procedures for all members of a centrifuge crew. **(T-2)**. Detailed procedures will be found in centrifuge training facility Operating Instructions. Qualification documentation will be maintained as part of the training facility instructor folder. **(T-3)**.

5.4.3. All centrifuge crew members will maintain currency in responding to medical emergencies in the centrifuge. **(T-2)**. At a minimum, the unit will maintain an Automated External Defibrillator for emergency response. **(T-1)**. The Flight Commander of the centrifuge facility will direct emergency reactor training on a quarterly basis. **(T-2)**. At least two training sessions per year will involve a response from the flight surgeon. **(T-2)**. These training sessions will be locally scheduled and documented by each centrifuge training facility. **(T-3)**.

5.5. Medical Evaluations. Profile evaluations and medical monitoring for centrifuge medical evaluations will be determined by the attending flight surgeon.

MARK D. KELLY, Lt Gen, USAF
Deputy Chief of Staff, Operations

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

AFI 11-200, *Aircrew Training, Standardization/Evaluation, and General Operations Structure*, 21 September 2018

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

AFI 11-403, *Aerospace Physiological Training Program*, 30 November 2012

AFI 33-360, *Publications and Forms Management*, 01 December 2015

AFMAN 11-2A-10CV1, *A-10C Aircrew Training*, 9 Jul 2019 AFMAN 11-2F-15EV1, *F-15E Aircrew Training*, 20 June 2019

AFMAN 11-2F-15V1, *F-15 Aircrew Training*, 13 June 2019

AFMAN 11-2F-16V1, *F-16 Pilot Training*, 17 June 2019

AFMAN 11-2F-22V1, *F-22A Aircrew Training*, 12 April 2019

AFMAN 11-2F-35V1, *F-35 Aircrew Training*, 17 June 2019

AFMAN 11-2T-6V1, *T-6A Aircrew Training*, 26 June 2017

AFMAN 11-2T-38V1, *T-38 Aircrew Training*, 01 September 2017

AFMAN 11-421, *Aviation Resource Management*, 12 September 2018

AFMAN 33-363, *Management of Records*, 01 March 2008

AFPAM 11-419, *G-Awareness for Aircrew*, 17 October 2014

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

NATO STANAG 3827, *Requirements for Physiological Training of Aircrew in High “G” Environment*, 26 October 2017

Adopted Forms

AF Form 847, *Recommendation for Change of Publication (Flight Publication)*

AF Form 1274, *Physiological Training*

AF Form 1522, *ARMS Additional Training Accomplishment Report*

AF Form 4293, *Student Activity Record*

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

Abbreviations and Acronyms

AAT—Advanced Acceleration Training

ACC—Air Combat Command

AETC—Air Education Training Command

AF—Air Force

AFB—Air Force Base

AFPC—Air Force Personnel Center

AFSAT—Air Force Security Assistance Training

AFRC—Air Force Reserve Command

AFRIMS—Air Force Records Information Management System

AGSM—Anti-G Straining Maneuver

ANG—Air National Guard

AOP—Aerospace and Operational Physiology

AOPTU—Aerospace and Operational Physiology Training Unit

CC—Commander

CSO—Combat Systems Officer

DO—Director of Operations

DOA—Operations Division, Aircrew Performance

ENJJPT—Euro-NATO Joint Jet Pilot Training

ETCA—Education and Training Course Announcements

FACP—Fighter Aircrew Conditioning Program

FTU—Formal Training Unit

GLOC – G—Induced Loss of Consciousness

HGA—High-G Aircraft

HPW—Human Performance Wing

HUD—Heads up Display

IFF—Introduction to Fighter Fundamentals

IP—Instructor Pilot

MAJCOM—Major Command

MDS—Mission Design Series

NATO—North Atlantic Treaty Organization

NGB—National Guard Bureau

NPAT—Non-Pipeline Acceleration Training

OPR—Office of Primary Responsibility

OTA—Oracle Training Application

PIT—Pilot Instructor Training

RAT—Refresher Acceleration Training

SAF—Secretary of the Air Force

SGP—Chief Aerospace Medicine

SUPT—Specialized Undergraduate Pilot Training

STANAG—Standardization Agreement

UFT—Undergraduate Flying Training

UPT—Undergraduate Pilot Training

USAFSAM—United States Air Force School of Aerospace Medicine

USN—United States Navy

Terms

G—Applied acceleration expressed as a multiple of the acceleration due to gravity. The value of applied acceleration (a) on a pilot during a maneuver is $G = a/g$ where g is defined as standard gravity or acceleration due to gravity at the Earth's surface (9.81 m/s^2). (Gradwell and Rainford (2016), p.132).

G-Awareness Training—A comprehensive program ensures optimum G-awareness training of high G aircrew. The program consists of physiological and operational training on G-awareness, centrifuge training, and an ongoing continuation training program. This manual addresses only the centrifuge training portion of the G Awareness Program. For information regarding continuation training, please see appropriate MDS AFMANs.

High—G Aircraft (HGA) – HGA are aircraft capable of generating a G-loading in excess of 6.0 G. This definition is further divided into the following two categories:

Type 1 Aircraft—Aircraft capable of rapid G-onset rates greater than 6.0 G/sec, but are typically not employed above 7.5 G. Current US military aircraft which meet this definition are the A/O/A-10, T/AT-38, F-4, F-15E, and F/A-18.

Type 2 Aircraft—Aircraft capable of rapid G-onset rates greater than 6.0 G/sec and sustained G-loading greater than 5 seconds above 7.5 G. Examples of USAF military aircraft meeting this definition are the F-15C/D, F-16, F-22A, and F-35.

Type 1 and 2 personnel—Any pilot, CSO, flight surgeon, AOP personnel, student pilot in the fighter pipeline, other rated/nonrated aircrew, operational support flyer, or any other individuals assigned aeronautical orders assigned to an active flying billet or performing unrestricted flight in a Type 2 aircraft.