

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

**AIR FORCE INSTRUCTION 11-404**

**9 JUNE 2017**



***Flying Operations***

**FIGHTER AIRCREW ACCELERATION  
TRAINING PROGRAM**

**COMPLIANCE WITH THIS PUBLICATION IS MANDATORY**

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This instruction implements AFD 11-4, *Aviation Service*. It provides guidance and procedures for the acceleration training of Regular Air Force, Air National Guard and Air Force Reserve rated aircrew and other flyers who are either currently flying or are selected to fly high-G aircraft. Though the title has changed to reflect all aspects of acceleration training, the publication continues to describe primary, advanced, and refresher centrifuge training requirements, procedures for unsatisfactory completion and centrifuge training documentation, and establishes the required minimum crew and their qualifications for conducting centrifuge training operations. It integrates AETCI 11-406, *Fighter Aircrew Conditioning Program*, as **Chapter 4**, and establishes international acceptance procedures. Comprehensive information on the physiology of G-awareness covered in the academic phases of acceleration training is found in AFPAM 11-419, *G-Awareness for Aircrew*. Forward the 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 all Supplements must be routed to the OPR of this publication for coordination prior to certification and approval. 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 **paragraph 1.3** 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 Publication OPR for non-tiered compliance items. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with (IAW) Air Force Manual (AFMAN) 33-363, Management of Records, and disposed of IAW Air Force Records Information Management System (AFRIMS) Records Disposition Schedule (RDS).

## ***SUMMARY OF CHANGES***

**This document is substantially revised and must be completely reviewed.** Major changes include clarification of formal course requirements and the inclusion of the Fighter Aircrew Condition Program (FACP). This has replaced a stand-alone AETCI on conditioning for G-forces.

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## Chapter 1

### INTRODUCTION

**1.1. General.** This instruction 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 broad categories: Type 1 and Type 2. Type 1 aircraft are those aircraft that fly mission profiles with G-levels between 5.0 and 7.5 G, while Type 2 aircraft are those aircraft that perform mission profiles with G-levels up to 9.0 G.

**1.2. Acceleration Training Program Goals.** Prepare rated aircrew and other flyers for high-G flight and enhance combat capability and safety by optimizing aircrew defense against G-Loss of Consciousness (GLOC). This is accomplished through education and practical experience including physical conditioning, anti-G equipment, adequate G-oriented situational awareness, the physiology of high-G flight, and an awareness of the factors that affect a crewmember's G-tolerance. This instruction addresses only the centrifuge training portion of the G Awareness Program. For information regarding continuation training requirements, see AFI 11-2F-16V1, F-16 Pilot Training, AFI 11-2F-15V1, F-15 Aircrew Training, AFI 11-2F-15EV1, F-15E Aircrew Training, AFI 11-2A/OA-10V1, A/OA-10 Aircrew Training, and AFI 11-2T/AT-38V1, T-38 and AT-38 Aircrew Training, AFI 11-2T-6V1T-6A Aircrew Training, AFI 11-F/A-22V1F-22A Aircrew Training and AFI 11-2F-35Vol I, F-35 Aircrew Training.

1.2.1. Centrifuge training is a vital part of fighter aircrew acceleration training. The centrifuge is the best platform for teaching the proper Anti-G Straining Maneuver (AGSM). Specifically, training shall:

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

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

1.2.1.3. Identify aircrew with low G-tolerance and poor AGSM skill performance; and provide remediation training as required.

**1.3. Waiver Authority.** Unless otherwise specified, AETC A2/3/10 is the waiver authority for the provisions of this instruction. Send waiver requests through applicable channels to MAJCOM/A3 (or equivalent). As applicable, MAJCOM/A3s will forward requests for coordination to AETC/A2/3/10.

1.3.1. MAJCOM A3s may waive refresher centrifuge training for aircrew returning to operational aircraft. MAJCOM A3s must coordinate waiver requests for formal course entry requirements if other MAJCOMs own the formal training course.

1.3.2. Approved waivers will be posted IAW AFI 33-360 Publications and Forms Management. Additionally, provide an info copy of granted waivers to AETC/A3FM Workflow email at [aetc.a3fm.workflow@us.af.mil](mailto:aetc.a3fm.workflow@us.af.mil), with an info copy to HQ USAF/A3TF, within 5 duty days of waiver completion.

1.3.3. Waivers to centrifuge training will be considered for the following circumstances:

1.3.3.1. Aircrew is separating from the Air Force or retiring within 90 days (6 months for ANG aircrew) of when the aircrew would otherwise be required to attend training.

1.3.3.2. Aircrew failed centrifuge training and retraining but was recommended by commander to continue in Type 1 or Type 2 aircraft.

1.3.4. Tier requirements refer to waiver authority based on level of risk.

1.3.4.1. "Tier 0" (T-0) requirements are reserved for requirements that non-compliance is determined and waived by respective non-Air Force authority.

1.3.4.2. "Tier 1" (T-1) requirements are reserved for requirements that non-compliance may put airman, mission, or program strongly at risk, and may only be waived by the MAJCOM/CC or delegate with concurrence of publication approver. When multiple MAJCOMs are affected, then T-1 is appropriate.

1.3.4.3. "Tier 2" (T-2) requirements are reserved for requirements that potentially put the mission at risk or potentially degrade the mission or program and may only be waived by the MAJCOM/CC or delegate.

1.3.4.4. "Tier 3" (T-3) requirements are reserved for requirements that non-compliance has a remote risk of mission failure and may be waived by the Wing/CC but no lower than the OG/CC.

#### **1.4. Responsibilities.**

##### **1.4.1. AF/A3T.**

1.4.1.1. Provides guidance and policy for aircrew training IAW AFI 11-202 Vol. 1, *Aircrew Training*.

1.4.1.2. Provides fiscal advocacy to AF Personnel and Training Panel for planning, programming and budgeting requirements to support the Aerospace and Operational Physiology (AOP) centrifuge training program.

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

##### **1.4.2. AF/SG.**

1.4.2.1. Provides qualified personnel in specialty 43A and 4M0 Air Force Specialty Codes (AFSC) to conduct acceleration training and to operate acceleration AOP training devices.

1.4.2.2. Ensures 43A and 4M0 recruitment and accessions meet AF/A3T and AETC AOP Training manpower requirements.

1.4.2.3. Coordinates with AF/A3T on any 43A or 4M0 manpower changes that affect AOP acceleration training program manning.

1.4.2.4. Provides aeromedical support for the acceleration training program and provides medical treatment for injuries incurred at locations where training occurs.

1.4.2.5. Provides human performance consultation to AF/A3T and AETC for the AOP acceleration training program.

##### **1.4.3. AETC/A2/3/10.**

1.4.3.1. AETC, as the Lead Command for the AOP acceleration training program, sets policy and guidance IAW AFI 11-200, *Aircrew Training, Standardization/Evaluation, and General Operations Structure*.

1.4.3.2. AETC/A3FM oversees courseware and incorporates 711th Human Performance Wing (HPW) and AF Safety Center mishap investigation and prevention information into AOP acceleration courseware IAW governing instructions.

1.4.3.3. AETC/A3FM establishes criteria, conducts evaluations and recommends acceptance of formal international aircrew AOP acceleration training programs as meeting USAF requirements in coordination with SAF/IA, Air Force Security Assistance Training (AFSAT), and AF/A3TF. AETC/A3FM also 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.

1.4.3.4. Assesses the applicability, relevance, and effectiveness of the centrifuge training at each location. Ensures the aircrew AP centrifuge training program is in compliance with applicable directives using AF/A3TF checklist within every 24 months.

#### **1.4.4. AFMC/CC.**

1.4.4.1. AFMC/CC, through 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.

1.4.4.1.1. Provides logistical and fiscal support for Acceleration Training Program

1.4.4.1.2. The logistical support for the 711 HPW centrifuge will be provided through a human centrifuge maintenance service contract logistics support. AETC/A3FM manages fiscal support for the maintenance contract of the USAFSAM-OL San Antonio centrifuge. (T-2).

1.4.4.1.3. The 711th HPW United States Air Force School of Aerospace Medicine (USAFSAM) ensures proper Quality Assurance oversight of the contractor is maintained. 711th Contracting Squadron has overall responsibility for the contract. (T-2).

1.4.4.2. Is the advocate for centrifuge device requirements, maintenance, sustainment, and improvement through AFRL, and in coordination with AETC/A2/3/10.

1.4.4.3. AFMC/SG ensures appropriate 43A and 4M0 manning is available to execute AOP centrifuge training program requirements IAW this publication.

1.4.4.4. The 711 HPW will publish and distribute an annual centrifuge training schedule to AETC/A3F, ACC/A3T, AFPC/DPAOT, and all Undergraduate Flying Training Bases. The 711 HPW will provide AETC/A3FM an updated annual per student training cost. (T-2).

#### **1.4.5. MAJCOMs/NGB/AFRC that fly high-G aircraft.**

1.4.5.1. **MAJCOM/A3 Director.**

1.4.5.1.1. Identifies the Aerospace Physiology Training Program Manager IAW AFI 11-403, *Aerospace Physiological Training Program*; the Program Manager will: (T-2).

1.4.5.1.1.1. Conduct an annual review of mission design series (MDS)-specific acceleration training to ensure relevancy to aircrew in the MDS and provide findings to AETC/A3FM. AETC/A3FM will accomplish this on behalf of the Air Reserve Component (ARC).

1.4.5.1.1.2. Provide updates to AETC/A3FM resulting from Aircrew Protection Working Group meetings on any aircrew flight equipment and protective ensembles.

1.4.5.1.1.3. Participate in realistic training review boards (RTRBs) as required.

1.4.5.1.1.4. Assess applicability/effectiveness of operational aspects of training with applicable AFIs using checklist made available by AF/A3TF no less than biannually.

#### **1.4.5.2. MAJCOM/SG.**

1.4.5.2.1. Ensures appropriate medical personnel are available to execute acceleration training program requirements IAW this publication, any applicable MAJCOM supplement, and 11-2MDS series guidance.

1.4.5.2.2. Programs and provides resources for professional development of 43A and 4M0 personnel IAW Air Force Medical Service career path vectors and AFSC requirements.

#### **1.4.5.3. MAJCOM Requirements Directorate (A5 or A8) Director.**

1.4.5.3.1. Ensures MDS or Aircrew Flight Equipment (AFE) acquisitions, modifications or upgrades that affect G performance are coordinated with AETC/A3FM for review into acceleration training courseware. This review includes, but should not be limited to, courseware and training systems to ensure concurrency in addressing MDS-specific physiological, human factors and emergency procedure training requirements.

1.4.5.3.2. Coordinates 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 AFE acquisitions/modifications/upgrades.

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

#### **1.4.6. Operations Group/CC.**

1.4.6.1. Ensures 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-3).

1.4.6.2. Ensures assigned 43A and 4M0 personnel are trained IAW AFSC requirements. (T-2).

#### **1.4.6.3. Flying Squadron Commanders Fighter Aircrew Conditioning Program (FACP) Roles and Responsibilities**

1.4.6.3.1. Work closely with the FACP instructor (or trained Air Force personnel at joint training sites or ANG/AFRC units) to identify those students that may need improved G-fitness. 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.

1.4.6.3.2. 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. For instance, a student demonstrates early physical fatigue or difficulty in executing an effective AGSM.

1.4.6.3.3. May delegate responsibilities listed in 1.4.6.3.1 to flight commanders.

1.4.6.3.4. Ensure FACP Instructors use courseware provided by AETC/A3FM.

#### **1.4.6.4. Aerospace and Operational Physiology Training Unit (AOPTU) Flight Commander (or trained Air Force personnel at joint training sites or ANG/AFRC units).**

1.4.6.4.1. AOP Flight Commander ensures that AOP officers, fully qualified technicians, or other AF personnel at joint training sites or ANG/AFRC units have been trained to execute the FACP. Document this training in the FACP instructor's training records. Any of the courses/certifications identified in [para 4.5.2](#) fulfill this training requirement: Unit of assignment will ensure adequate resourcing of travel, supplies, and related costs necessary to qualify personnel to conduct FACP training. (T-3).

1.4.6.4.2. FACP Instructors. Educate students per syllabus requirements. FACP Instructor demonstrates 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 effective performance of each exercise following a warm-up period.

1.4.6.4.3. Grounding. Due to fatigue and residual motion sickness, students will not fly as a crew member for a period of 12 hours following centrifuge training unless cleared by a flight surgeon.

#### **1.4.6.5. Flying Training Instructor:**

1.4.6.5.1. Ensures students execute the prescribed fitness program that targets G-performance, as determined by the FACP instructor after the education phase.

1.4.6.5.2. Ensures students track progress toward improved G-fitness during advanced phase or until student track-selects to low-G aircraft. Assessments and exercise sessions may be documented in the student training folder.

1.4.6.5.3. Ensures students participate in at least three exercise sessions per week that include exercises to improve high-G fitness and execution of the Anti-G Straining Maneuver (AGSM).



1.4.6.5.4. Ensures that during the FACP self-assessment, students wear Air Force PT gear or unit-specific PT gear.

## 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 human operator to sustain consciousness during some flight maneuvers. Rated aircrew and other flyers exposed to high-G flight require acceleration training to reduce risk 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. Acceleration academic training, such as briefings and HUD tape reviews, will be provided IAW relevant 11-2MDS series publications and/or training syllabi.

**2.2. Personnel Requiring Centrifuge Training.** All USAF rated aircrew assigned to high-G aircraft are required to successfully complete centrifuge training commensurate with their aircraft G capability. 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. Any IPs who evaluate other aircrew on their AGSM must successfully complete a minimum of Primary Acceleration Training (PAT). 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.

2.2.1. T-38 Special Training Requirements. Pilots flying T-38 aircraft are required to complete PAT 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). 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.

2.2.2. Unless excepted in [2.2.1](#) any US Navy, US Army, US Marine Corps, or US Coast Guard rated aircrew member who will perform flight duties in USAF Type 1 or Type 2 aircraft are required to successfully complete USAF acceleration training commensurate with their aircraft G capability.

2.2.3. 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, will be provided to local AOP personnel for review and documentation on AF Form 1274; questions on international documentation will be referred to AETC/A3FM. 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 IAW this instruction.

2.2.4. 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. IAW AFI 11-403, Para 2.1.9, if the flight is not accomplished within the 72 hours, training will be re-accomplished.

2.2.5. Due to risk of injury, the individual's commander must approve centrifuge training if not completed as part of a formal AFSC awarding course.

2.2.6. Coordinate all other ETP requests with HQ AETC/A3FM. AETC/A3FM is the approval authority.

### **2.3. Centrifuge Training Courses : Primary Acceleration Training (PAT), Advanced Acceleration Training (AAT), Refresher Acceleration Training (RAT), Commander-Directed Acceleration Training (CDAT).**

2.3.1. **Primary Acceleration Training (PAT).** 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 Specialized Undergraduate Pilot Training (SUPT) and Euro-NATO Joint Jet Pilot Training (ENJJPT) for pipeline student pilots. PAT may occur prior to completion of primary flight training. All students must successfully complete PAT before flying solo in the T-38. Pipeline F-15E Combat Systems Officers (CSO) will receive this training after completion of CSO training and before first flight of Introduction to Fighter Fundamentals (IFF). Successful completion of PAT is a prerequisite for entry into the A-10 and F-15E formal training unit (FTU) courses; 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 Undergraduate Pilot Training are not required to complete PAT a second time. Additionally, pilots reporting to Type 1 training outside of SUPT/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, or F-22 aircraft will attend. Successful completion of AAT is a prerequisite for entry into the F-15C, F-16, and F-22 FTU courses. AAT may be completed upon selection to Type 2 aircraft but must be successfully completed before first flight at FTU.

2.3.3. **Refresher Acceleration Training (RAT).** RAT is designed for aircrew who previously completed AAT and who are returning to Type 2 aircraft after greater than 39 months in a non-flying billet. Aircrew with previous centrifuge training have solid foundations in G-awareness, flight discipline and risk management for the employment envelope and do not require refresher training if returning to the A-10, T-38, F-15E and F-35 aircraft after any non-flying duration.

2.3.4. **Commander-Directed Acceleration Training (CDAT).** CDAT 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.

2.3.5. **Non-pipeline centrifuge training courses.** For US and foreign exchange aircrew, inter-service transfer aircrew, flight surgeons, AOP officer, and other non-pipeline aircrew.

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

2.3.5.2. Non-pipeline aircrew requiring centrifuge training for Type 2 (e.g. F-15C, F-16, or F-22) aircraft may attend AAT without first completing PAT; however, these aircrew must receive the platform academics associated with PAT.

## **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://etca.randolph.af.mil> . Please see ETCA for contact information for scheduling and reporting. ETCA contacts also support missing documentation requests.

2.4.2. International Centrifuge Training Facilities. A list of international acceleration training programs that provide centrifuge training that meets USAF requirements is maintained by AETC/A3FM and located on the AF Portal

2.4.2.1. Requests for USAF acceptance of international acceleration training programs should be initiated through the appropriate country manager who coordinates with AETC/A3FM to review the training program. Upon request from SAF/IA and/or AFSAT/DO, AETC/A3FM identifies the best qualified AOP personnel to review the requesting country's acceleration/centrifuge training program. Two person teams, consisting of a field grade 43A3 and a 4M071, 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. AETC/A3FM will provide guidance and standardized evaluation checklists to the reviewer(s) to support this process. The reviewer(s) will provide a written summary of their findings and recommendations to AETC/A3FM, who will then forward the recommendation and supporting documentation to AETC/A3F for approval of unconditional acceptance. (T-1). 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 AETC/A3FM.

2.4.2.2. Courseware review is a required element in the recognition program and will include written instructor guides, student study guides, and program requirements.

2.4.2.3. International centrifuge training programs must be reviewed every 5 years via this coordination process. If program certification has lapsed, AETC/A3FM will coordinate re-certification process and may require a site visit; re-acceptance may be accomplished via courseware review only, if personnel are not able to evaluate.

2.4.2.4. Acceptance of physiological training IAW AFI 11-403 does not immediately infer acceptance of centrifuge training program. The acceptance trips may be combined, but each review functions separately to identify concurrence with USAF training requirements.

## **2.5. Scheduling and Travel Arrangements.**

2.5.1. Details for scheduling acceleration training are found in the AETC Education and Training Course Announcement (ETCA). AFPC fills AAT training quotas for fighter training pipeline aviators.

2.5.2. Foreign Military Sales 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.

2.5.3. AFPC/DPAOT will reassign a Training Line Number for the aircrew member to attend AAT training. Travel Orders will be processed by the student's MPF Formal Training Section. For initial and retraining, if required, PAT and RAT students will be scheduled directly through USAFSAM/FEPP. Aircrews are grounded on the 181st day following their first attempt until satisfactory completion of retraining or MAJCOM/A3 or NGB/A3 waiver is approved.

## **2.6. Documentation Required to Receive Centrifuge Training .**

2.6.1. All students must bring a current DD Form 2992, AF Form 1042, Medical Recommendation for Flying or Special Operational Duty, or service/country equivalent, indicating individual is medically cleared by a qualified flight surgeon or aeromedical examiner. If students are not medically cleared for flight or special operational duty, they will not be allowed to participate in centrifuge training and will be rescheduled before travel. (T-1).

**2.7. Documentation of Training.** A qualified AOP officer assigned to centrifuge operations will document successful completion of centrifuge training. If the AOP officer is not assigned to the centrifuge training facility, AOP officer must obtain written/telephone verification of training from the centrifuge training facility before documenting AF Form 1274.

2.7.1. AF Form 4293, Student Activity Record. This form will be used to document evaluations of AGSM performance. Students must ensure a copy of the AF Form 4293 goes into their flying training grade book upon return from centrifuge training.

2.7.2. Documenting Formal Centrifuge Courses. Use AF Form 1274 to document training directed by this publication. A complete list of course codes can be found in [Table 2.1](#). Request an example of a completed AF Form 1274 from AETC/A3FM if needed. Do not use AF Form 1274 to document training required by other AFIs or local requirements. AOPTUs are not required to maintain copies of completed 1274s but are required to maintain a list of names and pertinent information on students who received training. This list may be maintained using Aerospace Physiology Information Management System (APIMS) database or locally developed database or spreadsheet. Successfully completed centrifuge training courses will be updated in Oracle Training Application (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 and the appropriate training codes obtained from aircrew records management personnel. 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 but are required to maintain a list of names and pertinent information on students who received training. This list may be maintained using APIMS database or locally developed database or spreadsheet. (T-2).

**Table 2.1. AOP Training Task ID codes.**

<b>Formal Course ID</b>	<b>Training Course</b>
S-O-B/A-APC-P	Initial Centrifuge (Primary Acceleration Training)
S-O-B/A-APC-A	Centrifuge (Advanced Acceleration Training)
S-O-B/A-APC-R	Refresher Centrifuge (Refresher Acceleration Training)
S-O-B/A-APC-C	Commander Directed 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 section is required. Acceleration training academics are required on a recurrent basis by all aircrew and ops support flyers; 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 (i.e. DD Form 2992/AF Form 1042). Training consists of the following:

**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. Reference the 11-2MDS publication series 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 IAW techniques discussed in AFPAM 11-419, *G-Awareness for Aircrew*. (T-3). All aircrew will accomplish the training profiles prescribed in the outlines in [Attachments 2-5](#). (T-2).

**3.4. Grading Criteria .** The student is expected to demonstrate AGSM skill and proficiency at the centrifuge training facility. Grading criteria is on a pass/fail basis. Pass is assigned when 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. AF Form 4293s will be annotated with this grading 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 the AOP officer, with emphasis on improving each student's AGSM. 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/electronic mail of the failure and provide the commander a copy of the aircrew's training report and recommendations for improvement. AFPC/DPAOT

must be notified within 24 hours of all AAT and F-15E CSO failures. AFSAT/DO must be notified within 24 hours of all International student failures. (T-1). Schedule retraining within 60-180 days following first attempt failure.

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 first-attempt failure. The squadron commander may opt to restrict aircrew from solo high-G operations until successful completion of centrifuge retraining if desired after review of the centrifuge training record and consultation with the flight surgeon and an AOP officer currently assigned to the centrifuge. Operations Group commanders determine disposition of nonrated aircrew, operations support flyers, or any other individuals assigned aeronautical orders sent to centrifuge training IAW par 2.2 after their first attempt failure.

3.6.4. Conditioning program. The student's commander or commander-designated representative will monitor the aircrew's progress in any physical conditioning program. Aircrew must be afforded sufficient opportunity to work on their individual conditioning program IAW AF fitness guidance. Students should seek out local exercise physiology expertise from a Fighter Aircrew Conditioning Program (FACP) Instructor (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.

3.6.5. Second Attempt Training. A second attempt will be scheduled no earlier than 60 days following the student's first attempt failure. (T-3). This program 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, practical G-training profiles as described in attachments 2 through 5. Students must successfully perform all profile training during repeat training attempts, regardless of pass status of some runs during first training session. **Note:**

Aerospace Medicine Primary and Aerospace and Operational Physiology Officer course students may be considered for 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 AETC/A3FM of the aircrew's failure to complete retraining. 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. In addition, AFPC/DPAOT must be notified within 24 hours of all AAT and F-15E CSO failures. AFSAT/DO must be notified within 24 hours of all International student failures. (T-1).



3.7.2. Grounding and medical evaluation. Aircrew members are medically grounded pending completion of a medical evaluation by a qualified flight surgeon. 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/SGP or equivalent. 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 operations group commander or equivalent will conduct a unit-level operational review. 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 weapon system. The operations group commander 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. UPT students that fail a second attempt will be reviewed by owning MAJCOM for disposition. (T-1).

## Chapter 4

### FIGHTER AIRCREW CONDITIONING PROGRAM

#### 4.1. Overview Description and Goals.

4.1.1. Description and Goals. There is overwhelming evidence that 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 as part of foundational education to enable lifelong G tolerance. FACP adds scheduled high-G fitness education to all AETC Undergraduate Flying Training (UFT), Introduction to Fighter Fundamentals (IFF), and fighter Pilot Instructor Training (PIT) and Formal Training Unit (FTU) courses. FACP may be implemented throughout the aircrew member's career, with special consideration when returning to high-G environment after time off.

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.

4.1.3. The program consists of formal education as part of UFT, IFF, PIT, and FTU courses. The education phase is designed to educate aircrews on the components of fitness that are most important for improving AGSM performance. UFT students will complete an observed self-assessment by FACP instructors. The education may be used in formal G Continuation Training for follow-on aircraft.

#### 4.2. Scheduling and Participating in Fitness Training.

4.2.1. UFT students must receive FACP Education during the preflight phase. 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 instructor pilot (UIP), and transition/retraining 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 the knowledge 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. Safety and proper form will be emphasized for all exercises.

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 education.

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 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 long-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 help reduce the risk for injuries. Decreased flexibility, on the other hand, may reduce physical performance and increase injury risk during flight maneuvers. Core strength 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 core strength may contribute to a better AGSM and prevent short and long-term injuries that tend to result from the demands of high-G sorties. Core 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.

4.3.1.2. Exercise. FACP observers or instructors will demonstrate 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).

4.3.1.3. Observed Self-Assessments. FACP observers or instructors will oversee students' self-assessments as they complete the demonstrated exercises. In the absence of validated research on which exercise activities improve G performance, the selected exercises listed in AETC FACP courseware 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).

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

4.3.1.5. To reduce the risk for injuries, FACP instructors will emphasize the need for a quality warm-up before the exercise.

#### **4.4. Documentation.**

4.4.1. The student's FACP participation during UFT will be tracked as part of physiological training completion in the appropriate student tracking database, such as GTIMS. (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 Roles, Qualification and Training.** The FACP Observer, Instructor and Instructor Trainer provide the team to ensure the proper physical training is taught and conducted in order to prepare for high-G aircraft maneuvers. Courses listed in paragraph 4.5.2. provide the skills and knowledge for Instructors to provide exercise education and assessment. Courses completed before assignment as a FACP Instructor may be used to satisfy the required training for that position. Supervisors should evaluate training recency during their assessment of Instructor cadre.

4.5.1. FACP Observer: The Observer is the starting point for personnel to become familiar with the FACP program and exercise technique. FACP Observers will complete Physical Training Leader (PTL) course where available and maintain Heart Saver BLS certification. Their role is to watch and record FACP self-assessments. FACP observers demonstrate proper fitness techniques and specific exercises the student can perform to optimize high-G physical performance.

4.5.2. FACP Instructors will maintain Heart Saver BLS certification. 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 AETC Exercise Principles for G course (delivered by a certified Instructor Trainer). The AETC Exercise Principles for G course provides a broad review of exercise physiology and introduces the exercises that can be used as part of the baseline assessment for pilots entering sustained high-G aircraft training. FACP Instructors will meet the observer criteria, maintain an academic evaluation by a certified Instructor Trainer, and attend any instructor continuing education sessions scheduled by the local Instructor Trainer.

4.5.3. Instructor Trainer. Certified instructors who have demonstrated mastery of the basic skills necessary may complete additional training to serve as an instructor trainer. Instructor trainers ensure training standardization and enough basic instructors to effectively observe student self-assessments.

4.5.3.1. Academic Degree Criteria. A specific academic degree is not a prerequisite for instructor trainer designation. Non-degreed instructors must complete minimum of six semester hours of relevant college education courses. (T-3). Relevant courses include fitness, exercise science, acceleration physiology, fitness evaluation strategies,

performance measurement tools, exercise facilitator/personal trainer, and other courses that enhance the instructor's subject knowledge in exercise principles for G and teaching abilities.

4.5.3.2. Instructional Skills Assessment. Instructor trainers will evaluate FACP 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 AETC/A3FM and AFMSA/SG3P which delineates the following (with anonymity): (T-3).

- 5.1.1. Number of persons by MDS and crew position who attended training categorized by training program (e.g. PAT, AAT, RAT).
- 5.1.2. Number of failures and failure rate by training program, MDS, and crew position.
- 5.1.3. Injuries or medical problems associated with training, by aircrew MDS.
- 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.
- 5.1.5. Specific comments or recommendations by the facility chief regarding program policy or procedures.
- 5.1.6. Utilization IAW AFI 36-2251 via AF Form 4026.

**5.2. Digital Recording Disposition.** The release of student recordings will only be made to authorized personnel with permission from the AETC/A3F, AFRC/A3D, or NGB/A3O. The centrifuge facility will copy only the training profiles for the individual aircrew requested by the MAJCOM/A3 or NGB/A3. This copy will be labeled: “For official use only” and afforded protection from unauthorized disclosure. (T-3).

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

- 5.3.1. The centrifuge training facility will maintain individual aircrew training records according to AFMAN 33-363. This will serve as a back-up to 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 or MAJCOM/SGP (NGB/A3O/SGP for ANG aircrew). Requests for release of individual training reports to other agencies must be approved by the MAJCOM/A3T, AFRC/A3D, or ANG/A3O. These reports are ‘For official use only’ and afforded protection from unauthorized disclosure.

**5.4. Centrifuge Operations.** AETC/A3FM will review centrifuge training courseware before implementation into formal training and publish on the AETC Bookstore. Additionally, A3FM will publish courseware for local acceleration training courses on 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. A FS will be notified of centrifuge operations and placed on call in conjunction with emergency medicine notification. The on-call FS will be notified if emergency medical treatment is required. Flight Medicine or appropriate emergency medicine transport team must provide patient transport to medical treatment facility. (T-2).

5.4.2. 711 HPW will establish qualification criteria and procedures for all members of a centrifuge crew with the exception of the FS. 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. The Flight Commander of the centrifuge facility will direct emergency reactor training on a quarterly basis. At least two training sessions per year will involve response from the FS: These training sessions will be locally scheduled and documented by each centrifuge training facility. (T-2).

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

MARK C. NOWLAND, Lt Gen, USAF  
Deputy Chief of Staff, Operations

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

AFPD 11-4, *Aviation Service*

AFI 11-403, *Aerospace Physiological Training Program*

AFI 11-421, *Aviation Resource Management*

AFPAM 11-419, *G-Awareness for Aircrew*

AETC Syllabus P-V4A-A, *Specialized Undergraduate Pilot Training (T-38), Fighter*

AETC IG F-V5A-A/B-CT-IG, *G-Awareness and Centrifuge Training*

***Prescribed Forms***

AF Form 1274, *Individual Physiological Training Record*

***Adopted Forms***

AF Form 4293, *Student Activity Record*

AF Form 1042, *Medical Recommendation For Flying or Special Operational Duty*

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

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

***Abbreviations and Acronyms***

**ACC**—Air Combat Command

**AETC**—Air Education Training Command

**AFB**—Air Force Base

**AFMC**—Air Force Materiel Command

**AFMSA**—Air Force Medical Support Agency

**AFPC**—Air Force Personnel Center

**AFSAT**—Air Force Security Assistance Training

**AFRC**—Air Force Reserve Command

**AFRL**—Air Force Research Laboratory

**AGSM**—Anti-G Straining Maneuver

**ANG**—Air National Guard

**ANGRC**—Air National Guard Recruiting Center

**AOP**—Aerospace and Operational Physiology

**AOPTU**—Aerospace and Operational Physiology Training Unit



**COMBAT EDGE**—Combined Advanced Technology Enhanced Design G Ensemble

**CSO**—Combat Systems Officer

**FACP**—Fighter Aircrew Conditioning Program

**FAIP**—First Assignment Instructor Pilot

**FTU**—Formal Training Unit

**GLOC**—G-Induced Loss of Consciousness

**HGA**—High-G Aircraft

**HUD**—Heads Up Display

**IFF**—Introduction to Fighter Fundamentals

**IP**—Instructor Pilot

**MAJCOM**—Major Command

**MDS**—Mission Design Series

**NAF**—Numbered Air Force

**NGB**—National Guard Bureau

**OPR**—Office of Primary Responsibility

**PIT**—Pilot Instructor Training

**SUPT**—Specialized Undergraduate Pilot Training

**USAFSAM**—United States Air Force School of Aerospace Medicine

### *Terms*

**G**—Any force that produces an acceleration of 32.2 FPS (FPS = Feet Per Second), which is equivalent to the acceleration produced by the earth's gravity.

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

**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, AV-8, F-4, F-15E, F-35 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-15 C/D, F-16, and F-22A.

**Active 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.

## Attachment 2

### PRIMARY ACCELERATION TRAINING

**A2.1. Primary Acceleration Training (PAT) Overview.** PAT prepares aircrew for Type 1 high-G flight. PAT is conducted between the primary (T-6) and advanced (T-38) phases in Specialized Undergraduate Pilot Training (SUPT) and Euro-NATO Joint Jet Pilot Training (ENJJPT) for pipeline student pilots. Students must successfully complete PAT before flying solo in the T-38, unless approved for solo flight by the flying squadron commander following a first attempt failure, with the recommendation of a centrifuge qualified AOP officer. Pipeline F-15E CSOs will receive this training after completion of CSO training and before first flight of Introduction to Fighter Fundamentals (IFF). Successful completion of PAT is a prerequisite for entry into the A-10, F-15E and F-35 formal training unit (FTU) courses. Additionally, pilots reporting to Type 1 training outside of SUPT/CSO pipeline need to complete PAT training (e.g. C-17 pilot enrolled in Test Pilot School who will fly T-38 in TPS).

**A2.2. Centrifuge Profiles.** Completion of all centrifuge profiles prescribed by this section is required. All aircrew will train in the 13-degree upright seat and center stick configuration. Aircrew will train in the G-suit garment appropriate to their aircraft.

A2.2.1. First profile. Gradual on-set (0.1 G/s) run to peripheral vision loss (approximately 60 degrees vision loss). The purpose of this profile is to familiarize the aircrew with G-induced vision loss in a controlled environment, and to determine the aircrew's resting G-tolerance for the training day. The anti-G suit will be worn but not inflated during this profile.

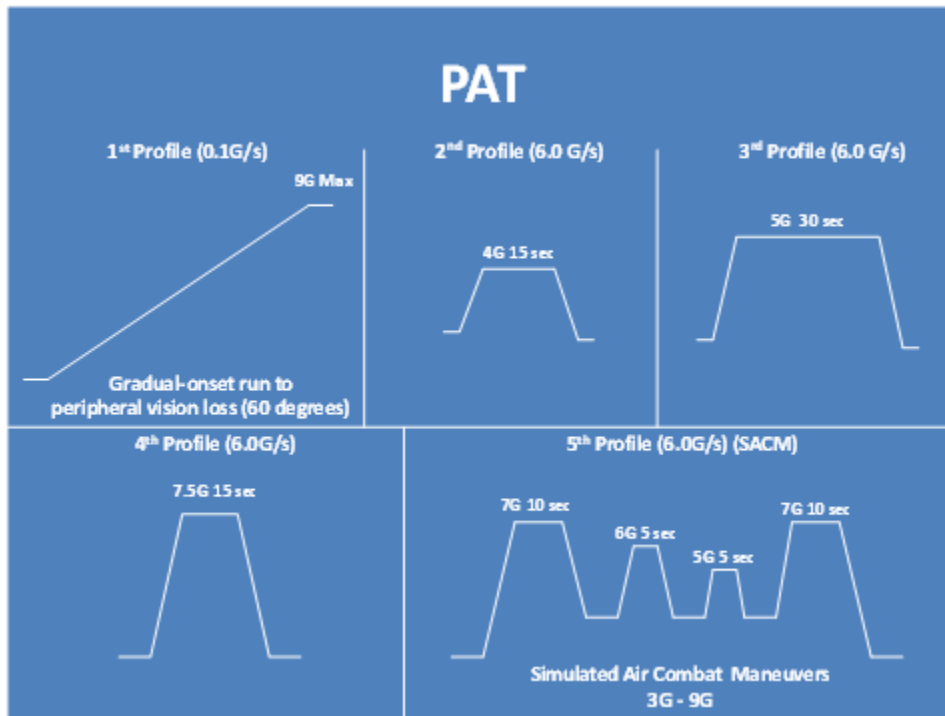
A2.2.2. Second profile. Rapid on-set (6.0 G/second) run to 4.0 G for 15 seconds. The purpose of this profile is to practice a proper AGSM. The anti-G suit will be on for this and all subsequent runs.

A2.2.3. Third profile. Rapid on-set (6.0 G/second) run to 5.0 G for 30 seconds. The purpose of this profile is to practice a proper AGSM.

A2.2.4. Fourth profile. Rapid on-set (6.0 G/second) run to 7.5 G for 15 seconds. The purpose of this profile is to establish aircrew confidence in their ability to operate in the high-G environment.

A2.2.5. Fifth profile. Simulated Air Combat Maneuver (SACM) (6.0 G/second); the aircrew tracks a target through a series of maneuvers at a minimum of 3.0 G and a maximum of 7.0 G. Automatic target tracking profile will be used for all rear cockpit trainees. The purpose of this profile is to perform the AGSM in a dynamic environment while fatigued.

Figure A2.1. PAT Centrifuge Profiles.



### Attachment 3

#### ADVANCED ACCELERATION TRAINING

**A3.1. Advanced Acceleration Training (AAT) Overview.** AAT is designed to illustrate differences in Type 1 and Type 2 flight. Previously PAT qualified aircrews selected for, or transitioning to Type 2, aircraft are required to attend. Successful completion of AAT is a prerequisite for entry into the Type 2, FTU courses. AAT may be completed upon selection to Type 2 aircraft but must be successfully completed before first flight at FTU.

**A3.2. Centrifuge Profiles.** Completion of all centrifuge profiles prescribed by this section is required. F-16 candidates will train in the 30-degree reclined seat. All other aircrew will train in the 13-degree upright seat. The maximum G identified in each profile will be adjusted for MDS specific requirements. Aircrew will train in the G-suit garment appropriate to their aircraft. AETC/A3FM will be the approving authority for any deviations in G-suit wear.(T-2).

A3.2.1. First profile. Gradual on-set (0.1 G/s) run to peripheral vision loss (approximately 60 degrees vision loss). The purpose of this profile is to familiarize the aircrew with G-induced vision loss in a controlled environment, and to determine the aircrew's resting G-tolerance for the training day. The anti-G suit will be worn but not inflated during this profile.

A3.2.2. Second profile. Rapid on-set (6.0 G/second) run to 6.0 G for 30 seconds. The purpose of this run is to practice a proper AGSM at reduced G-levels. The anti-G suit is on for this and all subsequent profiles.

A3.2.3. Third profile. Rapid on-set (6.0 G/second) run to 8.5 G for F-15 C/D, 9.0 G for F-16, and F/A-22 for 15 seconds. The purpose of this profile is to establish a proper performance of the AGSM at the G-level prescribed for the MDS.

A3.2.4. Fourth profile. Rapid on-set (6.0 G/second) run to 7.0 G for F-16, and F/A-22 and 6.0 G for all other MDS for 10 seconds. This profile will be completed in the 'Check 6' position.

A3.2.5. Fifth profile. SACM (6.0 G/second). The aircrew tracks a target through a series of maneuvers at a minimum of 3.0 G and maximum G tailored to the capabilities of the aircrew's gaining aircraft, i.e., 9.0 G for F-16, and F/A-22 and 8.0 G for F-15 C/D. An automatic target-tracking profile will be used for all rear cockpit aircrew. The purpose of this profile is to evaluate AGSM performance and G/AGSM situational awareness while physically fatigued and procedurally tasked.

Figure A3.1. F-16/F-22 AAT Centrifuge Profiles.

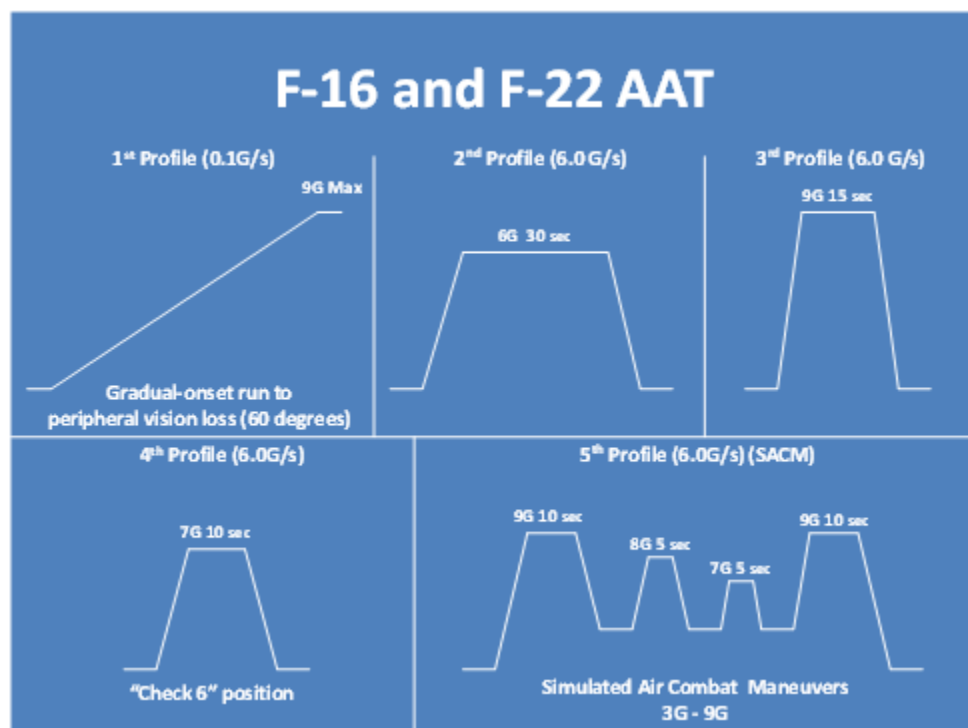
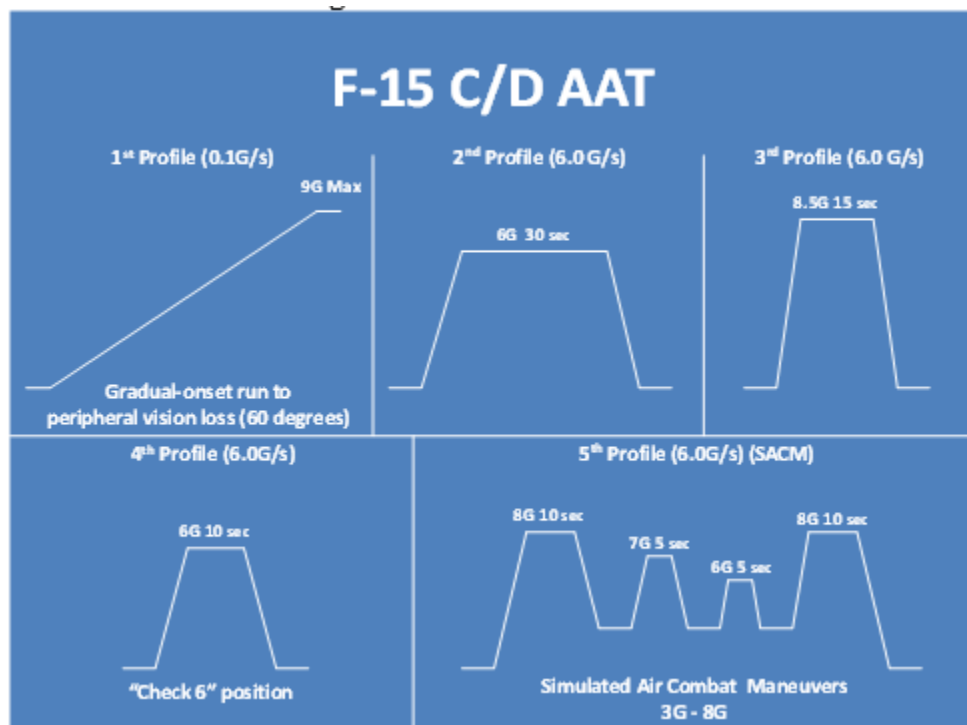


Figure A3.2. F-15C/D AAT Centrifuge Profiles.



## Attachment 4

### REFRESHER ACCELERATION TRAINING

**A4.1. Refresher Acceleration Training (RAT) Overview.** RAT is designed for previously AAT qualified aircrews who are returning to Type 2 aircraft after greater than 39 months in a non-flying billet. Aircrew previously centrifuge qualified at 7.5G or above have solid foundations in G-awareness, flight discipline and risk management for the employment envelope and do not require refresher training if returning to the A-10, T-38, F-15E and F-35 aircraft after any duration.

**A4.2. Centrifuge Profiles.** Completion of all centrifuge profiles prescribed by this section is required. F-16 candidates will train in the 30-degree reclined seat. All other aircrew will train in the 13-degree upright seat. The maximum G identified in each profile will be adjusted for MDS specific requirements. All profiles will be digitally recorded. Aircrew will train in the G-suit garment appropriate to their aircraft. AETC/A3FM will be the approving authority for any deviations in G-suit wear. Aircrew have the option of performing centrifuge profiles with COMBAT EDGE as appropriate to their aircraft. (T-2).

A4.2.1. First profile. Gradual on-set (0.1 G/s) run to peripheral vision loss (approximately 60 degrees vision loss). The purpose of this profile is to familiarize the aircrew with G-induced vision loss in a controlled environment, and to determine the aircrew's resting G-tolerance for the training day. The anti-G suit will be worn but not inflated during this profile.

A4.2.2. Second profile. Rapid on-set (6.0 G/second) run to 6.0 G for 10 seconds. The anti-G suit is on for this and all subsequent profiles. This profile will be completed in the 'Check 6' position.

A4.2.3. Third profile. Rapid on-set (6.0 G/second) run to 8.5 G for F-15 C/D, 9.0 G for F-16, and F/A-22 for 15 seconds. The purpose of this run is to demonstrate a proper AGSM.

A4.2.4. Fourth profile. SACM. The aircrew tracks a target through a series of maneuvers at a minimum of 3.0 G and maximum of 8.0 G for F-16, and F/A-22, and 7.0 G for F-15 C/D. An automatic target-tracking profile will be used for all rear cockpit aircrew. The purpose of this profile is to evaluate AGSM performance and G/AGSM situational awareness while physically fatigued and procedurally tasked.

Figure A4.1. F-16/F-22 RAT Centrifuge Profiles.

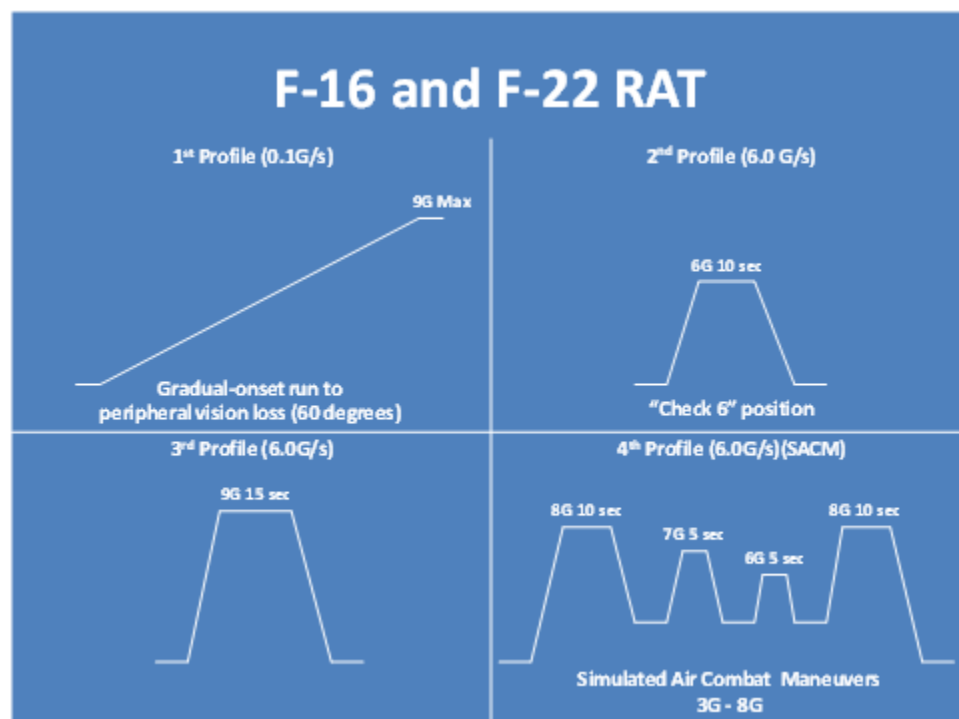
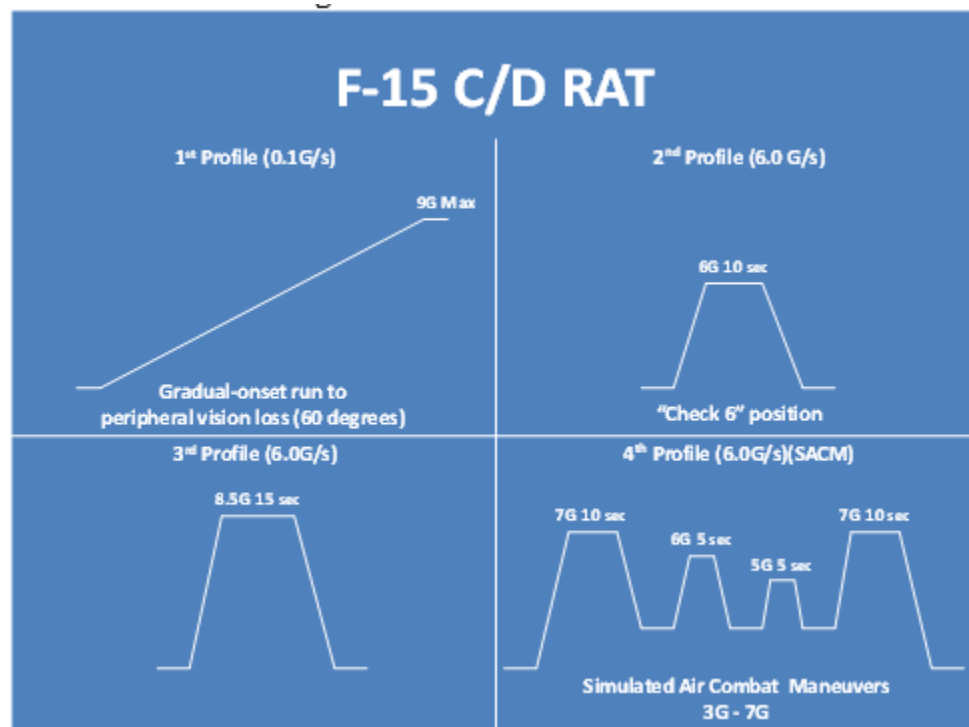


Figure A4.2. F-15C/D RAT Centrifuge Profiles.





## Attachment 5

### COMMANDER-DIRECTED ACCELERATION TRAINING

**A5.1. Commander-Directed Acceleration Training (CDAT) Overview.** CDAT is a tool used by an organizational commander to evaluate /improve an aircrew's performance or confidence under G. Any aircrew member may return at the discretion of his or her commander following in-flight G related issues or when an aircrew member's AGSM needs improvement. Commanders will use the evaluation from the CDAT outcome to direct follow-on training.

**A5.2. Training Overview.** A centrifuge qualified AOP officer will conduct the training program. This program is 2-3 days in duration depending on the student's technique and progress throughout training. Each student will receive a maximum of 2 training sessions per day and the program will consist of the following: (T-2).

A5.2.1. Analysis and review of individual AGSM performance in the centrifuge.

A5.2.2. Centrifuge training profiles tailored to the individual's needs. The purpose of these profiles is to work on the aircrew's specific problem areas. This may include training with COMBAT EDGE equipment.

**A5.3. Evaluation Criteria.** Training will be complete when student demonstrates continued AGSM proficiency. The centrifuge qualified AOP officer's recommendation will be made to the student's commander reporting the student's ability to mitigate physiological effects for the level of G required by their aircraft. (T-3).