

**BY ORDER OF THE COMMANDER
AIR EDUCATION AND TRAINING
COMMAND**

AETC INSTRUCTION 11-406

2 OCTOBER 2000

Flying Operations

**FIGHTER AIRCREW CONDITIONING
PROGRAM (FACP)**



COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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This instruction implements AFD 11-4, *Aviation Service*. It supports the program outlined in AFI 11-404, *Centrifuge Training for High-G Aircrew*, and AFPAM 11-419, *G-Awareness for Aircrew*. This instruction applies to AETC flying training students. It provides guidance and procedures for the conducting the FACP and the Fighter Aircrew Conditioning Test (FACT) and for handling aircrew students who do not satisfactorily complete this training program. This instruction may be used to develop an AETC-funded FACP for Air Force students in other than AETC-controlled flying training programs (for example, Navy flight training). This publication applies to Air National Guard and Air Force Reserve Command (ANG/AFRC) units.

Maintain and dispose of records created as a result of processes prescribed in this publication according to AFMAN 37-139, *Records Disposition Schedule*.

SUMMARY OF REVISIONS

This document is substantially revised and must be completely reviewed.

This instruction replaces AFI 11-404/AETC Sup 1. All references to AETC procedures for centrifuge training for high-G aircrew has been incorporated in AFI 11-404. All references to G-loc procedures have been moved to AETCI 36-2205, *Flight Training Student Administration and Management*. The remaining FACP procedures have been incorporated into this AETCI and modified to incorporate fighter-bound navigator students.

Section A—FACP Goals and Requirements

1. Goals of the FACP. The goals of the FACP are to improve the G-tolerance, G-endurance, and cockpit strength of fighter aircrews; identify and correct insufficiently conditioned aircrews before they enter the high-G environment; and establish effective physical conditioning habit patterns. The FACP adds scheduled anaerobic fitness training and testing to all AETC undergraduate flying training (UFT), introduction

to fighter fundamentals (IFF), and flying training unit (FTU) courses for fighter-bound or potential fighter-bound students as well as ANG/AFRC units.

2. Scheduling and Participating in Anaerobic Fitness Training:

2.1. Anaerobic fitness training will be incorporated in all student syllabi from the primary phase (phase 1) of UFT through fighter FTU graduation or track selection to low-G aircraft. Students will participate in anaerobic training sessions according to AFPAM 11-419 at least three times per week. Sessions should last at least 1 hour.

2.2. Senior officers (colonel and above) are exempt from FACP and FACT, but they are encouraged to participate. For joint service and international students and instructor pilots (IP) in Air Force training programs, participation in FACP is also optional but encouraged. Students who track-select to low-G aircraft may participate in FACP on a voluntary basis. Fighter students in JSUPT pilot instructor training (PIT), FTU upgrade instructor pilot (UIP), and requalification (TX-2) will participate in syllabus-directed conditioning programs and FACT as familiarization (FAM) only because the lengths of their courses may be too short to reach FACT goals. **NOTE:** T-37, T-38, IFF, and FTU flight training instructors should participate in anaerobic and aerobic conditioning programs to improve their fitness and G-tolerance and because they are role models to students.

Section B—Meeting FACT Requirements

3. Overview. The FACT provides students and trainers information they need to assess individual anaerobic strengths and weaknesses and focus anaerobic training on proper areas. FACT testing is mandatory for AETC students (except senior officers and those exempted in paragraph 2.2.).

4. Goals of the FACT. Every Air Force flying training student must pass the FACT before starting IFF. Students will be tested during primary (phase 1 or early in phase 2) of UFT to establish individual baselines and provide maximum opportunity to meet FACT goals by UFT graduation. Students failing to meet FACT goals will be tested again at the start of the T-38 phase or strike fighter phase to measure progress and determine who needs extra effort to succeed (**NOTE:** At the discretion of the flying squadron commander, those who previously achieved FACT goals may be retested.) Recurring testing will be conducted at IFF and FTU to ensure students continue to meet program goals. Instructor participation in FACP is encouraged, but not required.

5. Failure To Meet FACT Goals:

5.1. Students who do not meet FACT goals will be entered into a conditioning program supervised by the flight commander. The emphasis will be on correcting weak areas.

5.2. When a student does not pass the FACT prior to UFT graduation, the aerospace physiology training flight commander (or the Air Force flight commander at joint training sites or ANG/AFRC units) will notify the student's squadron commander by memorandum. The squadron commander will review the student's training records, including JSUPT or JSUNT centrifuge results, and recommend disposition to the operations group commander (or equivalent at joint training sites or ANG/AFRC units). Through the wing commander, the operations group commander (or equivalent at joint training sites or ANG/AFRC units) will notify 19AF/DO with a copy to HQ AETC/SGP. The 19 AF commander will make the final determination on student disposition.

6. Measuring Fitness Through the FACT. The FACT will determine an individual's muscle fitness as it applies to operating high-G aircraft, and it will identify anaerobic weaknesses that can be improved through specific physical conditioning described in AFPAM 11-419. Anaerobic fitness (muscle strength and endurance) is essential to performing effective anti-G straining maneuvers without fatigue. Aerobic fitness (measured in ergometry testing) increases blood supply to the working muscles which significantly reduces recovery time between engagements and sorties.

Section C—Administering the FACT

7. Guidelines:

7.1. Aerospace physiology personnel (or trained Air Force personnel at joint training sites or ANG/AFRC units) administer the FACT on AETC-provided Cybex equipment (or equivalent equipment at ANG/AFRC units). Individuals must complete a minimum of ten 6-second count repetitions in each of five strength events, plus 20 pushups, 30 abdominal crunches, and 20 endurance leg presses each in 60 seconds. There is a 1-minute rest period between each event and between strength and endurance portions of the test.

7.2. The FACT contains eight exercise events divided into two categories--strength and endurance. The test will be administered in the order provided on AETC Form 1705, **Fighter Aircrew Conditioning Test Score Sheet**. To pass this test, individuals must complete a minimum of ten repetitions in each of five events in the strength category plus the minimum required repetitions in all three events in the endurance category (unless specific test events are excluded by the flight surgeon and documented on the test subject's AF Form 1042, **Medical Recommendation for Flying or Special Operational Duty**). Repetitions above the maximum do not count. The individual's total FACT score will be calculated by adding together the strength and endurance scores.

7.3. Individuals should stretch out and warm up sufficiently before beginning the FACT to reduce risk of injury. To improve their warmup effectiveness and to establish proper form, test subjects should do a few lightweight repetitions in each event before lifting the required amount. Maintaining proper form is important to reduce the risk of injury. Individuals with poor anaerobic fitness are at great risk when they try to exceed their capabilities. Test administrators should stop the test anytime injury appears likely. The individual's supervisor should be notified, and the test should be rescheduled after the individual has completed additional training.

8. Strength Events. This portion of the test measures muscular strength and consists of five events.

8.1. The test administrator will calculate the percentage (weight factor) of the individual's body weight for each event to determine the amount of weight the subject is required to lift. Weigh the individual with shoes off, subtract 3 pounds for clothes, and round to the nearest 5 pounds.

8.2. Write the lift requirements in the spaces provided. For example, if Capt Smith weighs 190 pounds, he would be required to lift 65 pounds (190 by .35 equals 66.5, rounded to 65) in the arm curl, 150 pounds in the bench press, 135 pounds in lat pulls, 305 pounds in the leg press, and 95 pounds in leg curls. Individuals must complete a minimum of *10 repetitions in each event* to pass this test.

8.3. On AF Form 1705, record the number of repetitions completed in the space provided between the "minimum repetitions" standard and "maximum repetitions" allowable numbers (Section II). Remember, the minimum standard must be achieved for any points in an event. Total the five events and write

the score in the Strength Score (Section IV). If an individual does not complete the minimum requirements to pass, enter "0" in the Strength Score (Section IV).

8.4. Every repetition should consist of a 2:3:1 second count. That is, the pushing or pulling (concentric phase) motion will take 2 seconds, the return to the starting position (eccentric phase) will take 3 seconds, and the pause between repetitions will take 1 second. Although this slower speed is more difficult than the way most people lift weights, it is *required* for this test. It was designed to measure an individual's ability to maintain muscle contractions over longer periods of time.

8.5. The test administrator should demonstrate the procedure and count off each test subject's repetitions, substituting the number of the repetitions completed for the "6" count (for example: "1, 2, 3, 4, 5, (1); 1, 2, 3, 4, 5, (2); etc.") Repetitions should be completed in smooth and controlled movements without dropping the weights against the stack. The test administrator has the final determination on procedures and what repetitions will be counted as meeting requirements. Common sense should be used for minor variances in form. The requirements for each strength event are shown in **Figure 1**.

Figure 1. Strength Event Requirements.

1. Arm Curl:

- 1.1. Adjust seat height so upper arms are parallel to the floor. Grip handles lightly with palms up.
- 1.2. Start repetition by bending elbows, bringing hands toward forehead.
- 1.3. Only those repetitions where lower arm travels beyond 90 degrees vertical will count.
- 1.4. Buttocks must remain on seat pad at all time (no rocking motions).

2. Bench Press:

- 2.1. Adjust seat height so upper handles (horizontal grips) are level with sternum (just below armpits).
- 2.2. Grip upper (horizontal) handles.
- 2.3. Push foot pedal to advance handles so upper arms extend perpendicular from shoulders and approximately 90 degrees at elbows.
- 2.4. Slowly release foot pedal and place feet flat on floor platform.
- 2.5. Start movement by pressing handles forward. Only those repetitions where arms extend to approximate full extension will count. (Do not lock out elbows.)
- 2.6. Complete each repetition by returning to starting position (upper arms extending perpendicular from shoulders and 90 degrees at elbows).
- 2.7. When finished with the test, use foot lever to gently lower weights.

3. Lat Pull:

- 3.1. Adjust height of knee pads so lower legs are perpendicular to floor.
- 3.2. Grasp the **close grip bar** (small ~ 4 inch bar), palms facing in.
- 3.3. Back should be slightly reclined and stable (no rocking).
- 3.4. Start movement by pulling bar down toward chest.

- 3.5. Buttocks must remain on seat pad at all times.
- 3.6. Only repetitions where grip is pulled below shoulder level will count.

4. Leg Press:

- 4.1. Adjust starting position of sled to obtain 90-degree angle at knees.
- 4.2. Adjust body position on sled so head, shoulders, and elbows remain in contact with pads and knees are aligned with toes. (Maintain a foot position that keeps toes at or above height of knees.)
- 4.3. Start movement by straightening legs smoothly.
- 4.4. Only those repetitions where legs extend to approximate full extension will count. (Do not lock out knees.)

5. Leg Curl:

- 5.1. Adjust leg pad so it is positioned just above Achilles tendons.
- 5.2. Adjust body position on bench so knees are located off the bench and aligned with the machine axis of rotation.
- 5.3. Start movement by curling heels toward buttocks.
- 5.4. Only these repetitions where lower legs travel beyond 90 degrees vertical will count.

9. Muscular Endurance Events:

- 9.1. This portion of the test measures the subject's ability to perform repeated muscle movements for a given period of time. Individuals are required to complete a minimum number of repetitions within a 60-second timeframe. A rest period between the strength and endurance portions of test will be provided, but the endurance and strength portions of test must be accomplished during the same session. A 60-second rest period will be provided between events, but no resting is permitted while performing an event. If the test subject stops for more than 1 second during an event, the event is over.
- 9.2. Record the total number of repetitions for each event in Section III of AF Form 1705 and write the total score in Section IV. Individuals must complete the minimum repetitions in each event to pass this test. (Mark "0" in total score if minimum is not achieved.) The requirements to complete a repetition for each event are shown in **Figure 2**.

Figure 2. Muscular Endurance Event Requirements.**1. Pushup:**

- 1.1. Establish a front-leaning position with both legs extended.
- 1.2. Hands should be shoulder-width apart and arms extended (but not locked out).
- 1.3. After the test administrator says "go," lower upper body until arms bend to at least 90 degrees. Then return to the starting position in one smooth continuous motion.
- 1.4. Keep back straight.
- 1.5. Timing starts when the administrator says "go."
- 1.6. Only those repetitions (up to maximum) completed in 60 seconds will count.

2. AB Crunch:

- 2.1. Lie flat on mat with feet elevated on bench, calves parallel to floor, and knees bent 90 degrees.
- 2.2. Arms should be crossed on chest with head and shoulders on floor.
- 2.3. After the test administrator says "go," curl upper body, using only abdominal muscles until arms (between wrist and elbow) make contact with thighs.
- 2.4. Return to starting position. (Shoulders must return to mat each time.)
- 2.5. Only those repetitions (up to maximum) completed in 60 seconds will count.

3. Leg Press:

- 3.1. Starting position and basic mechanics are the same as for the strength test, but with a 1.0 weight factor (subject's body weight) and no slow-speed lift requirements as specified in strength tests.
- 3.2. After test administrator says "go," start repetition by straightening legs.
- 3.3. Pause briefly in the full-extension position. (Do not lock out knees.)
- 3.4. Return to starting position (90-degree angle at knees).
- 3.5. Only those repetitions (up to maximum) completed in 60 seconds will count.

10. Test Results:

10.1. **Total Score/Fitness Category.** Collect the scores from each section and record them in the appropriate spaces. Compute the total score by adding the two scores together (Section IV of the AF Form 1705). Mark the appropriate fitness category block next to the subject's total score. If minimum repetitions are not accomplished in all events, mark "unsatisfactory" in the fitness category.

10.2. **Supervisor Notification.** The test administrator will notify a supervisor of individual test results by sending a hard copy of the subject's test within 1 week of completion. Supervisors of individuals who fail the fitness test will be notified immediately by telephone and then sent a hard copy of the results. This notification will be documented in the block provided on AF Form 1705.

10.3. **Individual Counseling.** Anyone who fails the test will be counseled by the aerospace physiologist (or the Air Force flight commander at joint training bases or ANG/AFRC units), entered into a

supervised conditioning program, and retested. This counseling and recommended conditioning program will be documented in the space provided on AF Form 1705. The aerospace physiologist (or the Air Force flight commander at joint training bases or ANG/AFRC units) and test subject will each sign the test.

10.4. Testing Guidelines:

10.4.1. JSUPT students will be tested and their supervisors will be notified of results prior to assignment selection (or track selection, if applicable). JSUNT students will be tested and their supervisors will be notified of results as soon as practical after start of the Strike Fighter track. IFF and FTU students will be tested prior to their first syllabus sortie. Retests (if required) will be coordinated between the individual's supervisor and the aerospace physiologist (or Air Force flight commander at joint training bases).

10.4.2. Mark the type of test in Section I of the AF Form 1705 (for example, initial, annual, or retest). For the retest, annotate the number of the retest, (retest 1, 2, etc.). If for some reason an individual is medically restricted by the flight surgeon to complete specific events or the entire test, the individual's supervisor will receive a copy of the AF Form 1042 excusing the individual. The copy will be filed with (or in place of) the FACT.

WARNING

A passing FACT or cycle ergometry score *does not* guarantee acceptable G-tolerance or G-endurance. 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.

11. Form Prescribed. AETC Form 1705.

WILLIAM WELSER III, Major General, USAF
Director of Operations

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

AFPD 11-4, *Aviation Service*

AFI 11-404, *Centrifuge Training for High-G Aircrew*

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

AETCI 36-2205, *Flight Training Student Administration and Management*

Abbreviations and Acronyms

FACP—fighter aircrew conditioning program

FACT—fighter aircrew conditioning test

FAM—familiarization

FTU—flying training unit

G—gravitational pull, unit of measurement

IFF—introduction to fighter fundamentals

JSUNT—joint specialized undergraduate navigator training

JSUPT—joint specialized undergraduate pilot training

PIT—pilot instructor training

TX-2—transition course designed to requalify previously qualified aircrew in a weapon system

UFT—undergraduate flying training