DEPARTMENT OF THE NAVY
OFFICE OF THE CHIEF OF NAVAL OPERATIONS
2000 NAVY PENTAGON
WASHINGTON, D.C. 20350-2000

IN REPLY REFER TO:

OPNAVINST 3710.37A
N782B
06 February 2006

OPNAV INSTRUCTION 3710.37A

From: Chief of Naval Operations

Subj: ANTHROPOMETRIC ACCOMMODATION IN NAVAL AIRCRAFT

Ref: (a) NAVAIRINST 3710.9
(b) JSSG 2010-3
(c) OPNAVINST 3710.7T
(d) TECHNICAL MEMORANDUM NAWCADPAX/TM-2002/2

Encl: (1) Anthropometry Screening Process
(2) Anthropometric Measurement Procedures
(3) Anthropometric Data Measurement Record
(4) Navy and Marine Corps Fleet and Training Aircraft Pipeline Anthropometric Requirements

1. Purpose. To set forth policy and to delegate responsibilities for the implementation of a program to ensure anthropometric compatibility when selecting prospective Naval Aviators/Naval Flight Officers (including applicants, candidates, and students) and when assigning aeronautically designated officers to Navy and Marine Corps aircraft. This instruction exists to enhance safety in Naval Aviation. This instruction has been administratively revised and should be reviewed in its entirety.

2. Cancellation. OPNAVINST 3710.37.

3. Background. It is essential to accurately match prospective and designated aviators to appropriate aircraft. Emerging technology has made it viable to take accurate and consistent anthropometric measurements of both personnel and cockpit geometry. New policy, detailed in this instruction, will ensure consistent application of anthropometric measurement results. Proper execution of this anthropometric program will enhance selection and pipeline assignment of prospective and designated aviators, aircrew safety, equipment safety, readiness and affordability.

4. Discussion. Anthropometry is the science of measuring the human body, its parts, and functional capacities. A field screening tool for applicants (enclosure (1)) supports rapid assessment of anthropometric suitability. Anthropometric measurement procedures (enclosure (2)), and anthropometric restriction (AR) coding for both personnel and aircraft have been developed to provide more detailed assessment compatibility. The AR coding for Navy and Marine Corps aircraft is provided in reference (a). Use of these procedures and AR codes is required in order to maximize safety and promote human performance of aviation students and designated personnel by assignment to compatible aircraft/crew stations.

5. Policy. The following policies are set forth for anthropometric accommodation in naval aircraft:

a. It is incumbent upon all naval recruitment/selection sources to ensure that accurate anthropometric measurements of prospective Naval Aviators/Naval Flight Officers are taken as early in the accession process as possible. Early screening, using criteria found in enclosure (1), should result in early identification of individuals with possible anthropometric incompatibilities. In cases where such screening indicates that fit may be characterized as "measurement required" (as defined in enclosure (1), Table (1)), full anthropometric measurement and assessment is required before any aviation selection.

b. Because the consequences of assigning an anthropometrically incompatible crewmember to an aircraft can be both costly and potentially catastrophic, waivers shall not be submitted nor considered for prospective Naval Aviators/Naval Flight Officers.

c. Designated Navy or Marine Corps aviation personnel identified with an anthropometric incompatibility in assigned aircraft shall be referred to Bureau of Naval Personnel (PERS-43) or Commandant of the Marine Corps (ASM) respectively for disposition.

d. All new acquisition aircraft developed and procured for Navy and Marine Corps use shall accommodate the anthropometric range of the aviator population specified by reference (b) or the aircraft Type/Detail specification. Accommodation of less than the full range shall be justified through trade-off studies and cost/benefit analyses.

e. State of the art measuring techniques of both aircraft and aviation personnel, coupled with the detailed analysis of the myriad of possible combinations of physiological differences encountered in the aircraft have rendered dynamic cockpit

evaluations (fit-checks) obsolete. Therefore, fit-checks may only be performed in those aircraft for which the Naval Air Systems Command has established fit-check criteria (reference (a)). Fit-checks may also be used to resolve safety-of-flight issues influenced by anthropometric factors not addressed by anthropometric restriction codes. Fit-check results shall not be used to qualify a prospective Naval Aviator/Naval Flight Officer whose anthropometric measurements are outside the limits of published anthropometric restriction codes.

f. The minimum and maximum nude body weights allowed for those entering naval aviation flight training are 103 pounds and 245 pounds, respectively (reference (b)). For specific aircraft ejection seat limitations refer to reference (c). Certain characteristics of individual type/model/series aircraft, e.g., center of gravity limitations, or aviation life support equipment may result in further limitations.

g. Prior to selection for flight training, all prospective Naval Aviators/Naval Flight Officers shall undergo full anthropometric measurements to be recorded and submitted on the Anthropometric Data Measurement Record, OPNAV 3710/37A (07/05), enclosure (3). Reviewing authorities shall ensure that prospective aviators meet service anthropometric requirements for training and fleet aircraft assignment(s).

h. Prospective Naval Aviators/Naval Flight Officers shall demonstrate anthropometric compatibility with a minimum of two fleet and training aircraft pipelines. Pipeline for the purposes of this instruction is defined as: A series of courses (and associated training aircraft), e.g., "jets," "multiengine-land based airplanes," "helicopters," "E-2/C-2," or "MV-22," which provide instruction ultimately leading to assignment to a specific fleet aircraft type. Enclosure (4) provides guidance on training pipeline aircraft leading to fleet aircraft assignment eligibility.

6. Scope. This program is applicable to all Navy and Marine Corps Aeronautically Designated Officers, prospective Naval Aviators/Naval Flight Officers, and any other personnel assigned to fly in naval aircraft in a flight status.

7. Responsibilities

a. Commander Naval Air Forces (CNAF) shall serve as the program policy coordinator. Coordination with Commandant of the Marine Corps (CMC), Bureau of Naval Personnel (BUPERS), Bureau of Medicine and Surgery (BUMED), Chief of Naval Air Training (CNATRA) and Naval Air Systems Command (NAVAIRSYSCOM) is

essential to the success, effectiveness and applicability of this program.

b. CMC shall support the implementation of this program within the Marine Corps to ensure anthropometric compatibility of Marine Corps Aeronautically Designated Personnel upon initial assignment after completion of instruction at the Naval Air Training Command and when considering individuals for transition/conversion training thereafter.

c. COMNAVAIRSYSCOM shall:

(1) Serve as advisor to CNO and CNAF on anthropometric issues.

(2) Manage the overall Aircrew Anthropometric Engineering Program. This includes determining the scope of naval aircraft requiring anthropometric measurements, the resources required to measure aircraft crew stations, analyzing and developing anthropometric measuring procedures, identifying AR codes and crewmember weight restrictions, and developing and managing an anthropometric measurement certification program.

(3) Keep the AR codes current by updating dimensional data as modifications to existing aircraft and/or aircrew clothing and equipment occur, or as new aircraft are introduced.

(4) Ensure that future aircraft designs are compatible with predicted aircrew anthropometry and accommodate the anthropometric range of the aviator population specified by reference (b).

d. CNATRA shall:

(1) Ensure anthropometrically compatible pipeline assignments of student Naval Aviators/Naval Flight Officers to current inventory of training and pipeline aircraft. Fit-checks shall not be conducted, except as permitted by this instruction.

(2) Ensure anthropometric coding and copies of the student's Anthropometric Data Measurement Record are entered as part of the student's Aviation Training Jacket and Naval Air Training and Operating Procedures Standardization (NATOPS) jacket respectively.

(3) Support the accession decision process, through the use of technical guidance in references (a), (c), and (d), provide assessment of anthropometric compatibility for prospective Naval Aviators/Naval Flight Officers.

(4) Refer to BUPERS(PERS-43) or CMC(ASM) respectively, for disposition prior to commencing any further aviation training, those Navy or Marine Corps students not capable of being assigned to two or more pipelines.

e. CMC(ASM)/BUPERS(PERS-43) shall:

(1) Ensure prospective aviators meet aviation anthropometric entrance standards outlined in references (a) and (c) before commencing initial aviation training. Anthropometric waivers shall not be granted to prospective Naval Aviators/Naval Flight Officers.

(2) Coordinate with CNATRA to ensure compatible initial assignments of newly aeronautically designated personnel.

(3) Ensure Aeronautically Designated Personnel receive assignments to anthropometrically compatible aircraft.

f. Chief, Bureau of Medicine and Surgery shall:

(1) Train/indoctrinate Aeromedical Safety Officers (AMSOs), Flight Surgeons and Enlisted Aeromedical technicians (NEC 8406), and others so assigned in the processes, procedures and techniques for accurate anthropometric evaluations.

(2) Establish policy to ensure that anthropometric measurements taken at Navy Military Treatment Facilities (MTF) are accurately recorded for all prospective Naval Aviators/Naval Flight Officers seeking aeronautical designation. This information shall be recorded on the Anthropometric Data Measurement Record as part of the prospective Naval Aviators/Naval Flight Officers medical examination and forwarded to the Naval Aerospace Medical Institute for review.

(3) Ensure anthropometric measuring equipment at MTF's performing anthropometric measurements is available, standardized, properly maintained, and utilized.

g. Accession sources shall:

(1) Refer for full anthropometric measurement, as described in reference (a), those prospective student Naval Aviators/Naval Flight Officers whose stature categorizes them as "measurement required" per Table (1) of enclosure (1).

(2) Ensure that the individual's physical characteristics are anthropometrically compatible with requirements of reference (a) prior to offering any commitment

for selection to attend training as a student Naval Aviator or student Naval Flight Officer.

h. Commanding Officers shall:

(1) Submit anthropometric data to BUPERS (PERS-43), in the case of Navy personnel, and CMC (ASM) in the case of Marine Corps personnel, for those prospective aviation personnel who are found to be anthropometrically incompatible.

(2) Ensure that those designated aviators suspected of an anthropometric incompatibility, including those outside individual body weight limitations for assigned aircraft, are referred to the squadron flight surgeon or local Aeromedical Safety Officer for anthropometric evaluation. Designated aviators found to be anthropometrically incompatible shall be referred per paragraph 5c.

8. Liaison. Direct liaison between concerned commands is authorized for the purpose of implementing this instruction.

9. Form. OPNAV 3710.37A (07/05), Anthropometric Data Measurement Record, may be obtained at http://forms.daps.mil.

T. J. KILCLINE

Distribution:
Electronic only, via Navy Directives Website
http://neds.daps.dla.mil

Anthropometry Screening Process

1. Use of the anthropometry screening table, Table (1), based upon stature permits a rapid accession source assessment of the likelihood that a prospective Naval Aviator or Naval Flight Officer will be found to be anthropometrically compatible with current generation Navy and Marine Corps aircraft. Final determination of the anthropometric compatibility of an individual applicant shall be based upon evaluation of a completed set of anthropometric measures by the Naval Aerospace Medical Institute and the Chief of Naval Air Training. Such evaluation shall be based upon anthropometric standards established by the Naval Air Systems Command.

2. Individuals whose stature categorizes them as "not eligible" shall not require further measurement as it is very unlikely that a complete set of anthropometric measures will determine the individual to be anthropometrically compatible with Navy or Marine Corps aircraft. Such individuals shall not be offered an aviation training opportunity nor is it usually cost effective to conduct further anthropometric measures.

3. Individuals whose stature categorizes them as "measurement required" require further measurement, specifically, a complete set of anthropometric measures to determine whether the individual is anthropometrically compatible with training and fleet aircraft. Such individuals shall NOT be offered an aviation training opportunity until these measures have been evaluated by NAMI.

4. Note: All prospective Aeromedical Officers are subject to the Navy Student NFO limits.

Table 1: Department of the Navy Aviation Field Anthropometry Screening Standards (Stature)

Service and Designation	Measurement Required	Not Eligible
USN Student Pilot	62.0"-77.0"	Less than 62" Greater than 77"
USMC Student Pilot	62.0"-77.0"	Less than 62" Greater than 77"
USN Student NFO	60.0" -78.0"	Less than 60" Greater than 78"
USMC Student NFO	60.0" -78.0"	Less than 60" Greater than 78"

5. During measurement, the individual stands erect looking straight ahead with the feet together and weight distributed

equally on both feet. The shoulders and upper extremities are relaxed. Measure the vertical distance from a standing surface to the top of the head. Measurements are rounded up to the nearest quarter of an inch. Measurements should be taken at least twice. If there is a large variation (>1/2in.) between the two measurements, recheck body position and repeat the measurement.

Anthropometric Measurement Procedures

Sitting Height

Purpose

This measurement is to establish the applicant's sitting height. This measurement is used to insure adequate canopy clearance and is used to derive the sitting eye height used for out-of-cockpit visibility.

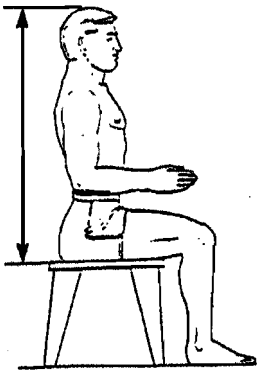
Equipment Required

Anthropometer

Measurement Procedure

1. The subject sits erect facing forward with the head level (see illustration below), the shoulders and upper arms relaxed, and the forearms and hands extended forward horizontally with the palms facing each other. The thighs are parallel, and the knees are flexed 90 degrees with the feet in line with the thighs.

2. Measure the vertical distance between the sitting surface and the top of the head with an anthropometer. The shoulders and upper extremities should be relaxed. Measure at the maximum point of quiet respiration.



Notes: *1. Measurements are to be taken to the nearest quarter inch. The measurement should be taken at least twice.*
2. If there is a large variation (>1/2in) between the two measurements, recheck the body position and repeat measurements.

Anthropometric Measurement Procedures

Buttock-Knee Length

Purpose

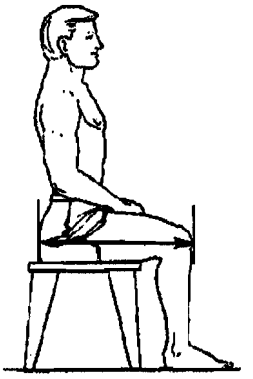
This measurement is usually associated with ejection seat clearance and threshold values between the knee and the glare shield (or canopy bow).

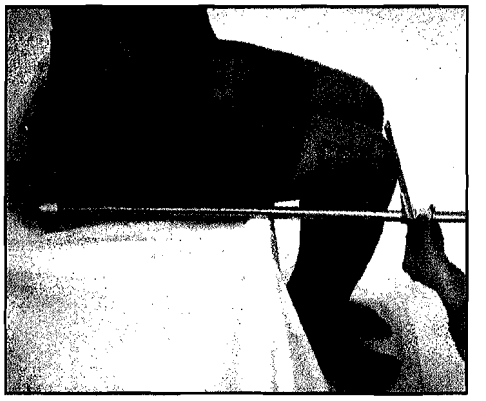
Equipment Required

Anthropometer

Measurement Procedure

1. While the subject sits erect, draw a landmark on the bottom tip of the right kneecap. The subject's thighs should be parallel, with the knees flexed at 90 degrees. The feet should be in line with the thighs, and lying flat on the surface of a footrest or the floor.





The anthropometer is placed flush against the buttock plate at the most posterior point on either buttock, and the anterior point to the right knee is measured with an anthropometer.

NOTES 1: *Measurements are to be taken to the nearest quarter inch. Measurements should be taken at least twice.*
2. If there is a large variation (>1/2in) between the two measurements, recheck the body position and repeat measurements.

Anthropometric Measurement Procedures

Thumb-tip Reach

Purpose

This measurement is used to assess the applicant's ability to reach controls in various locations within cockpits.

Equipment Required

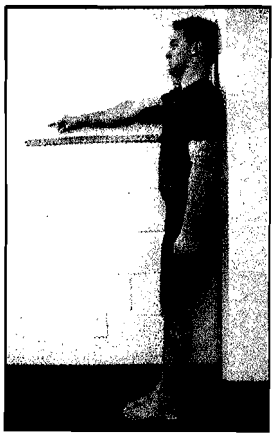
Wall-mounted linear scale.

Measurement Procedure

1. The subject stands erect in a corner looking straight ahead with the feet together and heels about 8 inches (20 cm) from the back wall.

2. With the buttocks and shoulder placed against the wall, the right arm and hand (palm down) are stretched horizontally along the scale while the thumb continues along the horizontal line of the arm with the index finger curving around to touch the pad at end of the thumb.

3. The subject's right shoulder is held against the rear wall. The horizontal distance from the back wall to the tip of the right thumb is measured.



NOTES: *1. Measurements are to be taken to the nearest quarter inch. Measurements should be taken at least twice.*
2. If there is a large variation (>1/2in.) between the two measurements, recheck body position and repeat measurements.

Anthropometric Measurement Procedures

Stature

Purpose

This measurement is used during initial screening to assess the applicant's overall anthropometric compatibility using the Department of the Navy Aviation Field Anthropometry Screening Standards (Stature).

Equipment Required

Anthropometer, or wall mounted linear scale, or medical scale with height rod.

Measurement Procedure

1. The subject stands erect looking straight ahead with the feet together and weight distributed equally on both feet. The shoulders and upper extremities are relaxed.

2. Measure the vertical distance from a standing surface to the top of the head.

NOTES: *1. Measurements are rounded up to the nearest quarter of an inch. Measurements should be taken at least twice.*
2. If there is a large variation (>1/2in.) between the two measurements, recheck body position and repeat measurements.

ANTHROPOMETRIC DATA MEASUREMENT RECORD
OPNAV 3710/37A (07-05)

Name (Last, First, Middle Initial)	GRADE/RATE	SSN	Designator	Service

Age	Sex (circle) M / F	Date: DD MMM YYYY	Activity Conducting Evaluation	Training Program (Circle One) Pilot NFO Other_____

Command Currently Assigned to: _____

Complete this form only when the individual is determined to be "measurement required" IAW OPNAVINST 3710.37A.
1. Measurements shall are to be taken IAW OPNAVINST 3710.37A Enclosure 2
2. Measurements shall be taken at the maximum point of quiet respiration.
3. Measurements recorded to the nearest ¼ of an inch
4. Measurements shall be repeated at least once
5. If there is a variation larger than ½" or ½ # between repeated measurements, recheck body position and repeat measurements

ANTHROPOMETRIC DATA	**Measurements**
Weight (W) #1 _____ #2_____	_____POUNDS
Stature (Height (H)) #1 _____ #2 _____	_____INCHES
Sitting Height (SH) #1 _____ #2 _____	_____INCHES
Buttock-Knee Length (BKL) #1 _____ #2 _____	_____INCHES
Thumb Tip Reach (TTR) #1 _____ #2 _____	_____INCHES

Distribution:
Original: Health Record
Copy 1: Retained in NATOPS Jacket
Copy 2: Individual's Aviation Training Jacket

Measurement Technician

Print_____

Signature_____ Date _____

PRIVACY ACT STATEMENT: Authority: 10USC 5013, Secretary of the Navy and Executive Order 9397 (SSN)
Purpose: USN/USMC Anthropometry Data Measurement Record Routine Uses: To assess aircraft anthropometric compatibility. Information not disseminated outside DOD.
Disclosure: Voluntary, as part of aviation accession and retention assessment. Failure to supply requested data may eliminate individual from consideration for duty involving flying.

Navy and Marine Corps Fleet and Training Aircraft Pipeline Anthropometric Requirements

1. Use of the fleet and training aircraft tables, tables (1) and (2), are to support the assessment of anthropometric compatibility and shall not be interpreted to confer or suggest a possible future assignment path.

2. To be considered suitable for a fleet aircraft assignment, a prospective student Naval Aviator/ student Naval Flight Officer must be anthropometrically compatible with all training aircraft shown in a training pipeline (column).

3. Prospective Naval Aviators/Naval Flight Officers shall demonstrate anthropometric compatibility with a minimum of two fleet and training aircraft pipelines.

Table 1: Navy and Marine Corps Pilot Fleet Aircraft and Training Aircraft Pipelines.

Jets	Multi-Engine	Helo	TACAMO	E-2/C-2	MV-22
T-34C/T-6A	T-34C/T-6A	T-34C/T-6A	T-34C/T-6A	T-34C/T-6A	T-34C/T-6A
T-45A/C	T-44/TC-12	TH-57	T-1 (USAF)	T-44/TC-12	T-44/TC-12
↓	↓	↓	↓	T-45A/C	TH-57
F/A-18,EA-6,AV-8	P-3, C-130	H-60, H-1, H-53, H-46	E-6A	E-2,C-2	MV-22

Table 2: Navy and Marine Corps Naval Flight Officer Fleet Aircraft and Training Aircraft Pipelines

Navigator	Strike	Strike-Fighter	E-2
T-6A	T-6A	T-6A	T-6A
T-43(USAF)	T-1(USAF)	T-1(USAF)	T-1(USAF)
↓	T-39	T-39	↓
↓	T-2	T-2	↓
P-3, E-6A	EA-6B	F/A-18	E-2C