



**DEPARTMENT OF THE NAVY**  
HEADQUARTERS UNITED STATES MARINE CORPS  
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WASHINGTON DC 20350-3000

IN REPLY REFER TO:  
1001  
ASM  
14 Feb 20

From: Aviation Manpower and Support Branch Head, HQMC Aviation  
To: Defense Advisory Committee on Women in the Services  
Via: Opportunity, Diversity and Inclusion Branch Head, HQMC Manpower & Reserve Affairs

Subj: REQUEST FOR INFORMATION RESPONSE FOR WOMEN IN AVIATION

Ref: (a) NAVAIR 00-35QH-2  
(b) NAVAIRINST 3710.9E  
(c) OPNAVINST 3710.37A  
(d) NAVAIR 13-series manuals  
(e) MCO 4400.177.H

1. Headquarters Marine Corps Aviation, by request from the Opportunity, Diversity and Inclusion Branch from Manpower and Reserve Affairs (M&RA), compiled information from several organizations to formulate a response for the 2020 March Defense Advisory Committee on Women in the Services (DACOWITS) Quarterly Business Meeting (QBM) request for information (RFI) on women in aviation.

2. The Marine Corps' entry and vetting process for aircrew, and acquisition of flight equipment originates from U.S. Navy policy. As a result, the majority of the Marine Corps' RFI response may be similar to the U. S. Navy's response. The Aircrew Systems program office (PMA-202) under Naval Air Systems Command (NAVAIR) and the Anthropometrics Model Manager under Naval Aviation Schools Command (NASC) were the primary contributors in formulating this response. Additional information on this topic is presented in references (a) through (e) with reference (e) covering Marine Corps policy on aviation supply and procurement of flight equipment processes.

3. The answers to the DACOWITS RFI for women in aviation are listed below:

a. What actions have been taken or will be taken to accommodate the physiological differences in women verses men since aviation positions have been opened to women? Pertaining to aircraft, flight gear, training, etc.

(1) The Marine Corps will continue to work with NAVAIR to ensure women in aviation receive the proper equipment and adequate training.

(2) The responses to sub-questions (b) through (g) help to explain current U.S. Navy policies on actions that have been taken to safely accommodate aircrew of different weights and sizes, which remain within the engineering constraints of already-procured aircraft.

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b. What are the anthropomorphic measurement requirements for service as a pilot? Service as Air Crew? When were these requirements established?

(1) NASC response:

(a) Pilots, Naval Flight Officers, and Aeromedical Officers are compared against the Anthropometric Restriction Codes (ARC) for each aircraft platform, which is promulgated by NAVAIR. ARCs are considered limitations and no Anthropometric waivers shall be granted. No Anthropometric restrictions exist for enlisted aircrew positions and they do not get anthropometric measurements.

(b) As per OPNAVINST 3710.37A, NAVAIR is designated as the overall Aircrew Anthropometric Engineering Program manager. Responsibilities include 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. The ARCs are promulgated in the NAVAIRINST 3710.9E and NAVAIR M-3710.1. The spreadsheets of the NAVAIR M-3710.1 Appendix C-E are included along with all above mentioned instructions. The Appendices are almost unreadable in the instruction, therefore the spreadsheets are necessary to interpret the information.

(c) Categories of ARCs include Nude Body Weight (lbs), Sitting Eye Height (SEH), Thumb Tip Reach (TTR), Buttock-to-Knee Length (BKL), and Sitting Height (SH). As per Appendix A of the NAVAIR M-3710.1 individuals must be 103-245 lbs, 26-31.5 inches SEH, 26-31.5 inches TTR, 20.4-29 inches BKL, and 31-41 inches SH.

(d) All Navy and Marine Corps aircraft were re-evaluated using updated cockpit mapping technologies as explained in NAVAIR M-3710.1 pg. 3-1. The instruction was released in Feb 2017 delineating the new ARCs based on the updated remapping.

(2) USMC response: No changes.

c. Approximately what percentage of Service members were disqualified from flight status based on these requirements? Provide breakdown by gender.

(1) NASC response:

(a) In 2013, aviation training transitioned from flying the T-34C aircraft to the T-6 aircraft. The following data is representative of disqualifications after the transition (2014 to present).

(b) In 2017, the T-6 was re-evaluated by NAVAIR specifically for TTR restrictions. The results were released in early 2018. From 2014-2018, 4% of all applicants were disqualified from aviation. Of the 4% of all applicants, 26% were males and 74% were females. After the release of the updated restriction codes for the T-6 aircraft, the percentage of

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all applicants disqualified from aviation dropped to 1%. Of that 1% of all applicants, 34% were male and 66% were female.

(c) The following is a breakdown of percentages for each category:

2013-2018

Weight:	9% (89% male / 11% female)
Sitting Height:	2% (50% male / 50% female)
Sitting Eye Height:	1% (46% male / 54% female)
Buttock Knee Length:	26% (32% male / 68% female)
Thumb Tip Reach:	62% (26% male / 74% female)

2018-2019

Weight:	6% (62% male / 38% female)
Sitting Height:	10% (38% male / 62% female)
Sitting Eye Height:	4% (0% male / 100% female)
Buttock Knee Length:	68% (35% male / 65% female)
Thumb Tip Reach:	11% (21% male / 79% female)

(2) USMC response: No changes.

d. What are the anthropomorphic measurement requirements for each aviation platform and why?

(1) PMA-202 response:

(a) PMA-202 advises Commander Naval Air Forces (CNAF) on body weight for ejection seats. The minimum and maximum nude weight range for designated flight personnel is 103 to 245 lbs. (CNAF M-3710.7, sec. 8.3.2.17). The following two excerpts provide additional context:

**WARNING.** Any person flying in an aircraft whose nude body weight is outside of the COMNAVAIRSYSCOM certified crew member weight range is at increased risk of serious injury or death during ejection or hard/crash landing.

**NOTE.** The T-6 aircraft is the only ejection seat aircraft certified safe for occupants as light as 103 lbs. All other in-service ejection seat aircraft are only certified safe for occupants as light as approximately 135lbs.

(b) The OPNAVINST 3710.37 presents the anthropometric standards for designated flight personnel and directs COMNAVAIRSYSCOM to advise the Chief of Naval Operations (CNO) and CNAF on anthropometric issues and to manage the overall Aircrew Anthropometric Engineering Program.

(2) USMC response: No changes.

e. What are the anthropomorphic measurements around which flight equipment is procured?

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(1) PMA-202 response: PMA-202 designs and develops flight equipment to support the 5<sup>th</sup> to 95<sup>th</sup> percentile of aircrew within the anthropometrical standards listed in the OPNAVINST 3710.37. Furthermore, PMA-202 manages the NAVAIR 13-series maintenance manuals, detailing the fitting of aircrew. There are provisions in these manuals to allow for custom made flight equipment for those aircrew outside of the 90 percent of personnel that the flight equipment is tested to fit. The procedures for custom fitting are found in NAVAIR 13-1-6.7-2 Aircrew Personal Protective Equipment (Clothing) Chapter 7. Upon NAVAIR flight clearance or safe for use certification these flight equipment items are procured by the Fleet through the Defense Logistics Agency (DLA) supply system.

(2) USMC response: No changes.

f. What is the process to procure sizes of flight equipment not in a squadron's inventory? How long does the process take?

(1) NASC and PMA-202 responses are not required.

(2) USMC response: Authorized flight equipment that is not in squadron inventory may be ordered through normal supply channels. The quickest turnaround for a squadron to receive an item that is within supply stockpiles can be one day. Otherwise, an item that is available within the system can be provided within 7 to 14 days. Back-ordered items will be shipped upon availability and could take up to three to six months.

g. What is the process to procure uniquely sized flight equipment not in standard issue?

(1) NASC response: A majority of flight equipment can be custom fit if the standard sizes do not accommodate an individual. In the event the PRs are unable to get a suitable fit the Aeromedical Safety Officer (AMSO) or a member of the FAILSAFE (Fleet Air Introduction and Liaison of Survival Aircrew Flight Equipment) Tiger Team can conduct a custom fit for the ill-fitting gear.

(a) Flight Clothing. Custom fit procedures for flight clothing are located in the NAVAIR 13-1-6.7-2 Aircrew Personal Protective Equipment (Clothing) maintenance manual, pages 7-1 – 7-18. This includes boots, flight suits, and gloves.

(b) Helmets. Custom fit helmets are also available if a suitable fit is not achieved with standard sized helmets. Information on guidance for custom fit helmets is located in NAVAIR 13-1-6.7-3 maintenance manual pages 003 01 for Rotary Wing helmets.

**NOTE.** If an acceptable fit cannot be found, a FAILSAFE maintenance representative shall be contacted for assistance. If the FAILSAFE maintenance representative is unable to get an acceptable fit with any size, a custom fit helmet may be procured through Gentex, or an HGU-56/P may be procured and used. Maintenance information for the HGU-56/P may be found on NATEC web-site listed under the 13-1-6.7-3-1. Also, maintenance manual TM 1-8415-216-12&P may be obtained through the US Army at Redstone Arsenal if desired. If an HGU-56/P is determined to be the only

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way to achieve an acceptable fit, the Aircrewman will then be limited in his or her flight capabilities. For example, a person assigned an HGU-56/P cannot use this assembly in a fixed wing instructor environment (see NAVAIR 13-1-6.7-3 007 01 for Tacair and Fixed Wing helmets).

**NOTE.** If an acceptable fit cannot be found, a FAILSAFE maintenance representative shall be contacted for assistance. If the FAILSAFE maintenance representative is unable to get an acceptable fit with any size, a custom fit helmet may be procured through Gentex. Fitting of the custom helmet will be done by a Gentex with the approval of the FAILSAFE maintenance representative.

(c) Harness/Vests. Harnesses can be custom fit as per NAVAIR 13-1-6.2 006 00 on page 14. A custom fit harness is available to those aircrew who are unable to be properly fit with available stock sizes. Two harnesses are used predominately in the US Navy, PCU-56/P Series and the PCU-78 series. The PCU-78 is an integrated harness and survival vest. The survival vest portion of the PCU-78 series is not adjustable. The harness is adjustable and can be custom fit. The CMU-33 vest which fits over the PCU-56 harness can be adjusted to accommodate varying body types.

(d) G-Suits. G-suits CANNOT be custom fit.

(2) USMC response: Uniquely sized flight equipment that is not within supply may be ordered by a squadron and is considered routine. However, the items must be authorized as outlined in the NAVAIR 00-35QH-2. Items that are not within the governing document will require the squadron to coordinate with PMA-202 to incorporate in to the NAVAIR 00-35QH-2 for authorization, and may take up to six months to receive the items. Reference (e) provides additional instructions for Marine Corps units procuring uniquely sized flight equipment.