

## **1.0 AVIATION PHYSICAL STANDARDS**

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### **1.1 INTRODUCTION**

Aviation physical standards ensure the most qualified personnel are accepted and retained by Naval Aviation. The intent is to prevent medical, physical, or psychological conditions from adversely affecting flight performance, safety, or mission. Standards differ between applicants and designated personnel, and among different flying classes based on risk assessment. Applicant standards are the most rigorous to ensure candidates are capable of training completion and continued performance as a designated Naval Aviator in the demanding environment. Designated aviation standards ensure consistent flight performance, safety, and mission completion. Disqualification removes an individual based on risks associated with a medical condition, while waivers of policy allow retaining an individual based on careful risk assessment, risk control measures, and mission requirements. All conditions may be considered for waiver to preserve the aviator in the mission; however, certain conditions, treatments, and medications are generally not conducive to aviation service due to a likely adverse impact on health, safety, or mission completion. Careful risk assessment and mission consideration by the Aeromedical Officer are necessary to assure time and resources are applied appropriately in all cases, but especially where risks make the likelihood of a waiver negligible. Additional guidance can be found in the various sections of this ARWG and communication with NAMI is encouraged before expending resources, especially on cases where it would be clear to a designated Aeromedical Officer that the case is atypical and/or carries an elevated risk.

### **1.2 GENERAL REQUIREMENTS**

Physical standards are published and maintained in the Manual of the Medical Department (MMD) Chapter 15. All applicants must meet general commissioning and/or enlistment standards in addition to aviation standards. If an applicant does not meet these standards, the applicant has a disqualifying defect and a waiver of standards is required. Designated personnel must remain fit for full duty and continue to meet the aviation standards published in the MMD. Any medical defect, disqualifying diagnosis, or chronic medication use requires a waiver of standards.

### **1.3 PURPOSE OF THIS GUIDE**

The purpose of this guide is to offer the Flight Surgeon, Aeromedical Examiner, Aeromedical Physician Assistant, AVT, and aviator an additional resource to quickly and efficiently look up standards. The Aeromedical Reference and Waiver Guide (ARWG) is NOT an inclusive document, but only highlights and gives guidance for the most common diagnoses and standards. The MMD is the proper document to reference for disqualifying conditions and physical standards. Flight Surgeons, Aeromedical Examiners, Aeromedical Physician Assistants and AVTs should be intimately familiar with the MMD Chapter 15 and it is suggested that they have access to a copy when making Aeromedical dispositions.

## 1.4 CLASSES OF AVIATION PERSONNEL

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Applicants, students, and designated aviation personnel are divided into the following three classes:

**Class I:** Naval Aviators and Student Naval Aviators (SNA). Designated Naval aviators are subdivided into three Medical Service Groups based upon the physical requirements of their specific flight duty assignment

**Medical Service Group 1:** Aviators qualified for unlimited or unrestricted flight duties

**Medical Service Group 2:** Aviators restricted from shipboard aircrew duties (include V/STOL) except helicopter

**Medical Service Group 3:** Aviators restricted to operating aircraft equipped with dual controls and accompanied on all flights by a pilot or copilot of Medical Service Group 1 or 2, qualified in the model of aircraft operated. A waiver to medical Service Group 3 includes pilot-in-command (PIC) authority unless PIC authority is specifically restricted.

**Class II:** Aviation personnel other than designated naval aviators or Student Naval Aviators including Naval Flight Officers (NFO), technical observers, Naval Flight Surgeons (NFS), Aeromedical Physician Assistant (APA), Aerospace Physiologists (AP), Aerospace Experimental Psychologists (AEP), Naval Aerospace Optometrists, all medical personnel (Corpsmen, Nurses, etc.) who provide patient care during aeromedical evacuation and/or en route medical transport, Naval Aircrew (NAC) members, and other persons ordered to duty involving flying and / or will fly on a regular basis.

**NOTE:** Many squadrons have non-designated personnel that fly as a TFO, intelligence operator, cryptologic technician, or other duty that requires regular flying. If these individuals fly on a regular basis, receive flight pay, and/or have flight-related duties, or mission critical duties, assigned to them while flying, they shall be considered as Class II Naval Aircrew with regard to aeromedical standards and physical submission requirements. Consult with NAMI if their flight status is unclear. However, waiver requirements may be different in these individuals, and will be considered on a case-by-case basis depending on required physical and physiological training and their particular duties, aircraft, and mission.

**Class III:** Members in aviation related duty not requiring them to personally be airborne including Air Traffic Controllers (ATCs), flight deck, and flight line personnel.

**Class IV:** Members in aviation related duty not requiring them to personally be airborne including Unmanned Aerial Vehicle (UAV) operators,

**Certain non-designated personnel, including civilians, may also be assigned to participate in duties involving flight:** Such personnel include selected passengers, project specialists, and technical observers. The specific requirements are addressed in the OPNAVINST 3710.7 series (Naval Air Training and Operating Procedures Standardization (NATOPS) General Flight and Operating Instructions) and shall be used to evaluate these personnel. **Selected passenger up chits are supposed to be used for a one or two flight "good deal" not for anyone who is going to fly as part of their job. Everyone who is flying on a regular basis, as part of their job, shall have an Aircrew Class II physical.**

## 1.5 CLASS I STANDARDS

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**Aeronautically Adapted (AA):** Designated personnel must remain Aeronautically Adapted. If member is Not Aeronautically Adapted (NAA), the psychiatric block should be checked abnormal with appropriate comments. Refer to MMD 15-67 for disposition of aviators found NAA.

**Valsalva:** Must demonstrate ability to equalize middle ear pressure.

**Self Balance Test (SBT):** Must pass.

**Dental:** Must have no defect which would react adversely to changes in barometric pressure (Type I or II dental examination required).

### Laboratory Testing:

Urinalysis: Must have normal values. Specifically must be negative for glucose, albumin/protein, and blood.

HIV Testing: Must be negative or documented that it was drawn.

Hematocrit: Males 40-52%. Females 37-47%. If values are outside of this range refer to ARWG for proper evaluation and disposition.

Lipid Panel: There are no standards at this time. This does not mean the flight surgeon can ignore these values. Individuals with hyperlipidemia should have documented evaluation, counseling, and treatment in accordance with standard medical guidelines.

Fecal occult blood testing: Required annually at age 50 and older or if personal or family history dictates. Digital rectal exam is not required.

**EKG:** Disqualifying conditions are:

1. Ventricular tachycardia defined as three consecutive ventricular beats at a rate greater than 99 beats per minute.
2. Wolff-Parkinson-White syndrome or other pre-excitation syndrome predisposing to paroxysmal arrhythmias.
3. All atrioventricular and intraventricular conduction disturbances, regardless of symptoms.
4. Other EKG abnormalities consistent with disease or pathology and not explained by normal variation.

**Blood Pressure:** Systolic must be less than 140 mm Hg and Diastolic less than 90 mm Hg. If a single measurement is outside of this range, a 3-5 day blood pressure check must be completed. The average of the 3-5 day blood pressure check must fall within the above standards.

**Pulse Rate:** Shall be determined in conjunction with blood pressure. If the resting pulse is less than 45 or over 100, an electrocardiogram shall be obtained. A pulse rate of less than 45 or greater than 100 in the absence of a significant cardiac history and medical or electrocardiographic findings shall not in itself be considered disqualifying.

**Distant Visual Acuity:**

1. Service Group 1, 20/100 or better each eye uncorrected, corrected to 20/20 or better each eye.
2. Service Group 2, 20/200 or better each eye uncorrected, corrected to 20/20 or better each eye.
3. Service Group 3, 20/400 or better each eye uncorrected, corrected to 20/20 or better each eye.

The first time distant visual acuity of less than 20/20 is noted a manifest refraction (not cycloplegic) shall be performed recording the correction required for the aviator to see 20/20 in each eye (all letters correct on the 20/20 line).

**Refractive limits:** Refractions will be recorded using minus cylinder notation. There are no limits. However, anisometropia may not exceed 3.50 diopters in any meridian.

**Near Visual Acuity:** Must correct to 20/20 in each eye using either the AFVT or standard 16 Snellen or Sloan notation nearpoint card. Bifocals are approved.

**Oculomotor Balance:**

1. No uncorrected esophoria more than 6.0 prism diopters.
2. No uncorrected exophoria more than 6.0 prism diopters.
3. No uncorrected hyperphoria more than 1.50 prism diopters.
4. Tropia or Diplopia in any direction of gaze is disqualifying

**Field of Vision:** Must be full.

**Color Vision:** Must pass any one of the following two tests:

1. PIP color plates (Any red-green screening test with at least 14 diagnostic plates; see manufacturer instructions for scoring information) randomly administered under Macbeth lamp: scoring plates 2-15, at least 12/14 correct.
2. Computer-Based Color Vision Testing: must achieve a passing grade on an approved and validated Computer-Based Color Vision Test.

(Note: All color vision tests will be administered as delineated in the NAMI Aeromedical Reference and Waiver Guide, Chapter 12.2. The Farnsworth Lantern (FALANT) was discontinued 31 Dec 2016. The FALANT or Optec 900 may be considered for selective aviators who were designated before 31 December 2016. Passing scores: 9/9 correct on the first trial or, if any are missed, at least 16/18 correct on the combined score of the second and third trials.)

**Depth Perception:** Only stereopsis is tested. Must pass any one of the following three tests:

1. AFVT: at least A – D with no misses.
2. Stereo booklet (Titmus Fly or Randot): 40 arc second circles.
3. Verhoeff: 8/8 correct on the first trial or, if any are missed, 16/16 correct on the combined second and third trials.

**Intraocular Pressure:** Must be less than or equal to 22 mm Hg. A difference of 5 mm Hg or greater between eyes requires an ophthalmology consult, but if no pathology noted, is not considered disqualifying.

**Hearing (ANSI 1969):**

Frequency (Hz)	Better Ear (dB)	Worse Ear (dB)
500	35	35
1000	30	30
2000	30	50

## 1.6 STUDENT NAVAL AVIATOR APPLICANT (SNA) STANDARDS

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**All applicants for pilot training must meet Class I standards except as follows:**

**Visual Acuity, Distant and Near:** Uncorrected visual acuity must not be less than 20/40 each eye, correctable to 20/20 each eye using a Sloan letter, crowded, eye chart (**Goodlite**). Vision testing procedures shall comply with those outlined on the Aerospace Reference and Waiver Guide Physical Exams section.

**Refractive Limits:** If uncorrected distant visual acuity is less than 20/20 either eye, a manifest refraction must be recorded for the correction required to attain 20/20. If the candidate's distant visual acuity is 20/20, a manifest refraction is not required. Total myopia may not be greater than -1.50 diopters in any meridian, total hyperopia no greater than +3.00 diopters in any meridian, or astigmatism no greater than -1.00 diopters. The astigmatic correction shall be reported in minus cylinder format.

**Cycloplegic Refraction:** This is required for all candidates to determine the degree of spherical ametropia. The refraction should be performed to maximum plus correction to obtain best visual acuity. Due to the effect of lens aberrations with pupil dilation, visual acuity or astigmatic correction, which might disqualify the candidate, should be disregarded if the candidate meets the standards for visual acuity and astigmatism with manifest refraction. A cycloplegic refraction should be performed at least 30 minutes after instillation of 2 gtts (5 minutes apart) 1% cyclopentolate.

**Slit Lamp Examination:** Required, and must demonstrate no pathology.

**Dilated Fundus Examination:** Required, and must demonstrate no pathology.

### **Hearing (ANSI 1969) :**

Frequency (Hz)	Decibel (dB)
500	25
1000	25
2000	25
3000	45
4000	55

**Anthropometrics and Height/Weight:** Refer to [NAVAIRINST 3710.9D](#) and [OPNAVINST 3710.37A](#).

**Reading Aloud Test.** Required if speech impediment exists or history of speech therapy or facial fracture. See MMD paragraph 15-95 or Physical Exam section of ARWG for text.

**Dental Readiness:** All Applicants must be Dental Class 2 or better.

## 1.7 DESIGNATED NAVAL FLIGHT OFFICER (NFO) STANDARDS

**Must meet Class I standards, except as follows:**

**Visual Acuity, Distant and Near:** No limit uncorrected. Must correct to 20/20 each eye.

**Refraction:** No limits.

**Oculomotor Balance:** No obvious heterotropia or symptomatic heterophoria (NOHOSH).

**Depth Perception:** Not required.

**Dental Readiness:** All Applicants must be Dental Class 2 or better.

## 1.8 APPLICANT STUDENT NAVAL FLIGHT OFFICER STANDARDS

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**Must meet Class I standards, except as follows:**

**Visual Acuity, Distant and Near:** No limit uncorrected. Must correct to 20/20 each eye. If the AFVT or Goodlite letters are used, a score of 7/10 on the 20/20 line constitutes meeting visual acuity requirements.

**Refractive Limits:** Manifest refraction must not exceed +/-8.00 diopters in any meridian (sum of sphere and cylinder) with astigmatism no greater than -3.00 diopters. Refraction must be recorded in minus cylinder format. Must have no more than 3.50 diopters of anisometropia in any meridian.

**Oculomotor Balance:** NOHOSH.

**Depth Perception:** Not Required.

**Slit Lamp Examination:** Required, and must demonstrate no pathology.

**Hearing:** Same as SNA Applicant.

**Dental Readiness:** All Applicants must be Dental Class 2 or better.

**Anthropometrics and Height/Weight:** Refer to [NAVAIRINST 3710.9D](#) and [OPNAVINST 3710.37A](#).

**Reading Aloud Test:** Required if speech impediment exists or history of speech therapy or facial fracture. See MMD paragraph 15-95 or Physical Exam section of ARWG for text.

**1.9 DESIGNATED: NAVAL FLIGHT SURGEON, NAVAL AEROMEDICAL PHYSICIAN ASSISTANT, NAVAL AEROSPACE PHYSIOLOGIST, NAVAL AEROSPACE EXPERIMENTAL PSYCHOLOGIST, AND NAVAL AEROSPACE OPTOMETRIST STANDARDS**

**Must meet Class I standards, except as follows:**

**Visual Acuity, Distant and Near.** No limit uncorrected. Must correct to 20/20 each eye. If the AFVT or Goodlite letters are used, a score of 7/10 on the 20/20 line constitutes meeting visual acuity requirements.

**Refractive Limits.** No limits.

**Oculomotor Balance.** NOHOSH.

**Depth Perception.** Not Required.

**1.10 APPLICANT: NAVAL FLIGHT SURGEON, NAVAL AEROMEDICAL PHYSICIAN ASSISTANT, NAVAL AEROSPACE PHYSIOLOGIST, NAVAL AEROSPACE EXPERIMENTAL PSYCHOLOGIST, AND NAVAL AEROSPACE OPTOMETRIST STANDARDS**

**All applicants must meet SNA Applicant standards except as follows:**

**Visual Acuity, Distant and Near:** No limit uncorrected. Must correct to 20/20 each eye. If the AFVT or Goodlite letters are used, a score of 7/10 on the 20/20 line constitutes meeting visual acuity requirements.

**Refraction.** No limits.

## 1.11 DESIGNATED AND APPLICANT NAVAL AIRCREW (FIXED WING) STANDARDS

**Must meet Class I standards except as follows.**

**Visual Acuity, Distant and Near:** No limit uncorrected. Must correct to 20/20 each eye. If the AFVT or Goodlite letters are used, a score of 7/10 on the 20/20 line constitutes meeting visual acuity requirements.

**Refraction:** No limits.

**Oculomotor Balance:** NOHOSH.

**Depth Perception:** Not required.

**Hearing:** Designated must meet Class I standards. Applicants must meet SNA Applicant standards.

## 1.12 DESIGNATED AND APPLICANT NAVAL AIRCREW (ROTARY WING) STANDARDS

**Must meet Class I standards, except as follows:**

**Visual Acuity, Distant and Near.** Must be uncorrected 20/100 or better, each eye corrected to 20/20. If the AFVT or Goodlite letters are used, a score of 7/10 on the 20/20 line constitutes meeting visual acuity requirements.

**Refraction.** No limits.

**Oculomotor Balance.** NOHOSH.

**Hearing.** Designated must meet Class I standards. Applicants must meet SNA applicant standards.



## 1.13 DESIGNATED AND APPLICANT AEROSPACE PHYSIOLOGY TECHNICIAN STANDARDS

**Must meet Class I standards except as follows:**

**Visual Acuity, Distant and Near.** No limit uncorrected. Must correct to 20/20 each eye. If the AFVT or Goodlite letters are used, a score of 7/10 on the 20/20 line constitutes meeting visual acuity requirements.

**Refraction:** No limits.

**Depth Perception:** Not required.

**Color Vision:** Not required.

**Hearing:** Designated must meet Class I standards. Applicants must meet SNA applicant standards.

**Age:** Applicants must be less than 32 years of age.

**Sinus X-rays:** Applicants must submit sinus films to NAVOPMEDINST Code 53HN with initial physical examination.

## 1.14 CLASS III PERSONNEL NON-DISQUALIFYING CONDITIONS

Class III personnel must meet standards for aviation personnel, but within those limitations, the following conditions are not considered disqualifying:

1. Hematocrit between 38.0 and 39.9 percent in males or between 35.0 and 36.9 percent in females, if asymptomatic.
2. Seasonal allergic rhinitis unless requiring regular use of antihistamines or medications causing drowsiness.
3. Nasal or paranasal polyps
4. Chronic sinus disease, unless symptomatic and requiring frequent treatment.
5. Lack of valsalva or inability to equalize middle ear pressure.
6. Congenital or acquired chest wall deformities, unless expected to interfere with general duties.
7. Mild chronic obstructive pulmonary disease.
8. Pneumothorax once resolved.
9. Surgical resection of lung parenchyma if normal function remains.
10. Paroxysmal supraventricular dysrhythmias, after normal cardiology evaluation, unless symptomatic.
11. Cholecystectomy, once resolved.
12. Hyperuricemia.
13. Renal stone once passed or in stable position.
14. Internal derangements of the knee unless restricted from general duty.
15. Recurrently dislocating shoulder.
16. Scoliosis, unless symptomatic or progressive. Must meet general standards.
17. Kyphosis, unless symptomatic or progressive. Must meet general standards.
18. Fracture or dislocation of cervical spine.
19. Cervical fusion.
20. Thoracolumbar fractures.
21. History of craniotomy.
22. History of decompression sickness.
23. Anthropometric standards do not apply.
24. No limits on resting pulse if asymptomatic.

## 1.15 DESIGNATED AND APPLICANT AIR TRAFFIC CONTROLLER STANDARDS (MILITARY AND DEPARTMENT OF THE NAVY CIVILIANS)

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Military must meet the standards in Chapter 15, Section III (Physical Standards); civilians shall be examined in military MTFs, by a Naval Flight Surgeon (or Aeromedical Examiner or Aeromedical Physician Assistant), and must meet the general [requirements for Civil Service employment as outlined in the Office of Personnel Management, Individual Occupational Requirements for GS-2152: Air Traffic Control Series](#). Both groups have the following additional requirements:

**Phorias:** NOHOSH.

**Depth Perception:** Not required.

**Slit Lamp Examination:** Required for applicants only. Must demonstrate no pathology.

**Intraocular Pressure:** Must meet Class I standards.

**Color Vision:** Must meet Class I standards.

**Hearing:** Applicants must meet SNA applicant standards. Designated must meet Class I standards.

**Reading Aloud Test:** The “Banana Oil” test is required for all applicants and other personnel as clinically indicated.

### **Department of the Navy Civilian ATCs:**

1. There are no specific height, weight, or body fat requirements.
2. When a civilian who has been ill in excess of 30 days returns to work, a formal flight surgeon’s (or Aeromedical Examiner or Aeromedical Physician Assistant) evaluation shall be performed prior to returning to ATC duties. DD2992 shall be used to communicate clearance for ATC duties to the commanding officer.

## **1.16 CRITICAL FLIGHT DECK PERSONNEL STANDARDS (DIRECTOR, SPOTTER, CHECKER, NON-PILOT LANDING SAFETY OFFICER AND HELICOPTER CONTROL OFFICER, AND ANY OTHER PERSONNEL SPECIFIED BY THE UNIT COMMANDING OFFICER)**

Frequency of screening is annual. Waivers of physical standards are determined locally by the senior medical department representative and commanding officer. No BUMED or NAVPERSCOM submission or endorsement is required. **Must meet the standards in Chapter 15, Section III (Physical Standards), except as follows:**

**Visual Acuity, Distant and Near:** No limits uncorrected. Must correct to 20/20. If the AFVT or Goodlite letters are used, a score of 7/10 on the 20/20 line constitutes meeting visual acuity requirements.

**Field of Vision:** Must have full field of vision.

**Depth Perception:** Must meet Class I standards.

**Color Vision:** Must meet Class I standards.

## **1.17 NON-CRITICAL FLIGHT DECK PERSONNEL STANDARDS**

This paragraph includes all personnel not defined as critical. Frequency of screening is annual. Waivers of physical standards are determined locally by the senior medical department representative and commanding officer. No BUMED or NAVPERSCOM submission or endorsement is required. **Must meet the standards in Chapter 15, Section III (Physical Standards) except as follows:**

**Visual Acuity, Distant and Near:** No limits uncorrected. Must correct to 20/40 or better in one eye, 20/30 or better in the other.

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**NOTE:** Because of the safety concerns inherent in performing duties in the vicinity of turning aircraft, flight line workers should meet the same standards as their flight deck counterparts.

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## **1.18 PERSONNEL WHO MAINTAIN AVIATOR NIGHT VISION SYSTEMS STANDARDS**

Personnel, specifically those aircrew survival equipment men (USN PR or USMC MOS 6060) and aviation electrician's mates (USN AE or USMC MOS 64xx), assigned to duty involving maintenance of night vision systems, or selected for training in such maintenance, shall be examined annually to determine visual standards qualifications. Record results in the member's health record. **Waivers are not considered. Standards are as follows:**

**Distant Visual Acuity:** Must correct to 20/20 or better in each eye and correction must be worn. If the AFVT or Goodlite letters are used, a score of 7/10 on the 20/20 line constitutes meeting visual acuity requirements.

**Near Visual Acuity:** Must correct to 20/20.

**Depth Perception:** Not required.

**Color Vision:** Must meet Class I standards.

**Oculomotor Balance:** NOHOSH.

## **1.19 SELECTED PASSENGERS, PROJECT SPECIALISTS, AND OTHER PERSONNEL**

Refer to OPNAVINST 3710.7. When ordered to duty involving flying for which special requirements have not been prescribed, personnel shall, prior to engaging in such duties, be examined to determine their physical qualification for aerial flights, an entry made in their Health Record, and a DD2992 issued if qualified. The examination shall relate primarily to the circulatory system, musculoskeletal system, equilibrium, neuropsychiatric stability, and patency of the eustachian tubes, with such additional consideration as the individual's specific flying duties may indicate. The examiner shall attempt to determine not only the individual's physical qualification to fly a particular aircraft or mission, but also the physical qualification to undergo all required physical and physiological training associated with flight duty. **No individual shall be found fit to fly unless fit to undergo the training required in OPNAVINST 3710.7 series, for the aircraft and/or mission.**

**Visual Acuity, Distant and Near:** No limits uncorrected. Must correct to 20/50 or better in one eye.

**NOTE:** Many squadrons have non-designated personnel that fly as a TFO, intelligence operator, cryptologic technician, or other duty that requires regular flying. If these individuals fly on a regular basis, receive flight pay, and/or have flight-related duties, or mission critical duties, assigned to them while flying, they shall be considered as Class II Naval Aircrew with regard to aeromedical standards and physical submission requirements. Consult with NAMI if their flight status is unclear. However, waiver requirements may be different in these individuals, and will be considered on a case-by-case basis depending on required physical and physiological training and their particular duties, aircraft, and mission.

## **1.20 MISSION ESSENTIAL NON-AIRCREW PERSONNEL THAT FLY IN MILITARY AIRCRAFT AND PERFORM MISSION ESSENTIAL FUNCTIONS (INCLUDING ENROUTE CARE PROVIDERS, AERIAL OBSERVERS, CRYPTOLOGY, INTELLIGENCE, AND OTHER)**

By definition, this category excludes “winged” Aircrew Personnel, personnel on DIFOPS orders or receiving Aviation Career Incentive Pay (Continuous or Contingency) or individuals whose responsibilities include the operation and/or coordination of the aircraft. While not critical to safety of flight, individuals in this category play a more significant role than a simple passenger, as they are essential to the completion of the aviation mission. Examples include, but are not limited to, medical En-Route Care Personnel (including non-flight surgeon physicians, nurses, corpsmen), cryptologists, intelligence personnel and other officer/enlisted members who are required to perform critical functions within the aircraft, during the flight, that are required for mission completion. Illustrative example: an en-route care corpsman has no responsibility for safe operation of the aircraft, but if s/he is unable to participate in a medevac mission, then the entire mission will fail. While conditions that can occur during flight or be exacerbated by the flight environment would not result in an aviation mishap, they could result in mission cancelation, diversion, or otherwise compromise the flight objectives.

Further, per NATOPS, these members require aviation physiology and water survival qualifications to perform their functions within an aircraft during flight operations. As such, they must be able to safely participate in aviation physiology and water survival training and qualification. As these members perform mission essential functions within the flight environment, Class II standards should be applied, but risk-appropriate waivers should be considered according to the member’s functions and duties performed within the flight environment. Waivers can be locally recommended by the local Aeromedical Officer and waivers may be granted by the local Commanding Officer or designate.

### **Requirements**

Any military LIP may perform this exam. Attention should be paid to any condition which would impair the ability to complete a physical training program which requires participants to swim 25 yards, tread water for two minutes and drown proof for two minutes in full flight gear, including helmet, gloves, boots, flight suit, parachute harness, and survival vest, as well as orally self-inflate their own life preserver and swim 15 yards underwater in a flight suit and boots.

Additionally, trainees may receive hypoxia recognition training using reduced oxygen breathing devices to simulated altitudes of 25,000 feet, so any condition that would be worsened by a hypoxic state should be clearly documented and are grounds for disqualification.

Document the examination using form NAVMED 6410/15 (TEST), which should be retained in the electronic medical record.

If the examination is completely normal, the form may be bottom lined by the LIP. Any abnormalities identified in the history of physical examination must be reviewed with a Flight Surgeon. If a Flight Surgeon is available locally, they should bottom line the physical to indicate concurrence. If they are not available locally, the examining provider should carefully note the name of the flight surgeon giving concurrence, and check the box indicating that concurrence was obtained remotely.

The Commanding Officer has final waiver approval authority for mission essential non-aircrew personnel.

NAMI may be consulted for cases requiring additional consideration.

### **Non-Aircrew Essential Personnel Physical Worksheet**

1. Perform the Physical and document on the NAVMED 6410/15 (TEST)
2. Member should retain a copy of the form as evidence of Exam.
3. Upload the form into Member's Electronic Health Record with physical exam entry.
4. Document aeromedical disposition on DD 2992.

### **Not Physically Qualified**

1. Each disqualifying condition must be addressed by the examining physician.
2. Each disqualifying condition should be individually determined to be disqualifying (CD) or not disqualifying (NCD).
3. A separate determination should be made, given the totality of the medical condition, if the individual should be waived to fly as mission-essential non-aircrew personnel. It is possible that an individual might have several conditions that are NCD or would be recommended for a waiver, but the combination of all conditions makes it inadvisable to recommend a waiver for the individual.
4. If and when waivers are granted, the local flight surgeon may provide a Flight Duty Clearance (Up-Chit). If concurrence is obtained remotely, document the name of the concurring flight surgeon on the Flight Duty Clearance notice as well.

### **Flight Duty Clearance (Up-Chit)**

1. DD 2992 for Mission Essential Non-aircrew personnel may be issued for up to one year, but may be issued for shorter periods if medically warranted.
2. DD 2992 must be maintained by the individual member and available at the time of physiology/swim qualification and actual flight duty.
3. Flight duty clearance is subject to revocation if the status of a waived condition changes, if the individual fails to comply with assigned waiver requirements or if a new, disqualifying condition develops.
4. A new physical and waiver submission must be performed for any new condition, change in established conditions or treatments, or if / when new waiver requirements are necessary.

**Note:** If the member is an applicant for any form of aviation training, or an actual designated "winged" Aircrew Member (including designation as "Flight Nurse"), a flight physical must be performed and submitted to NAMI IAW MANMED Chapter 15, Sections III and IV.

**Mission Essential Non-aircrew Personnel Physical Worksheet (NAVMED 6410/15 (TEST)):**  
<http://www.med.navy.mil/directives/Pages/NAVMEDForms.aspx>



## 1.21 NAVAL AVIATION WATER SURVIVAL TRAINING INSTRUCTORS (NAWSTI) AND RESCUE SWIMMER SCHOOL TRAINING PROGRAMS STANDARDS

Applicants, designated and instructor rescue swimmers must meet the general standards outlined in MMD Chapter 15, Section III. In addition, the following standards apply:

Visual Acuity, Distant and Near:

1. **Applicant Surface Rescue Swimmer.** No worse than 20/100 uncorrected in either eye. Must correct to 20/20 each eye.
2. **Designated Surface Rescue Swimmer.** No worse than 20/200 uncorrected in either eye. Must correct to 20/20 each eye.
3. **Naval Aviation Water Survival Training Program Instructor.** No limits uncorrected. Must correct to 20/20 in the better eye, no less than 20/40 in the worse eye.
4. **All categories.** If the AFVT or Goodlite letters are used, a score of 7/10 on the 20/20 line constitutes meeting visual acuity requirements.

**Psychiatric:** Because of the rigors of the high risk training and duties they will be performing, the psychological fitness of applicants must be carefully appraised by the examining physician. The objective is to elicit evidence of tendencies which militate against assignment to these critical duties. Among these are below average intelligence, lack of motivation, unhealthy motivation, history of personal ineffectiveness, difficulties in interpersonal relations, a history of irrational behavior or irresponsibility, lack of adaptability, or documented personality disorders.

Any examinee diagnosed by a psychiatrist or clinical psychologist as suffering from depression, psychosis, manic-depression, paranoia, severe neurosis, severe borderline personality, or schizophrenia will be recommended for disqualification at the time of initial examination.

Those personnel with minor psychiatric disorders such as acute situational stress reactions must be evaluated by the local medical officer in conjunction with a formal psychiatric evaluation when necessary. Those cases which resolve completely, quickly and without significant psychotherapy can be found fit for continued duty. Those cases in which confusion exists, review by the TYCOM force medical officer for fleet personnel or BUMED, M3F1 for shore-based personnel. Any consideration for return to duty in these cases must address the issue of whether the service member, in the opinion of the medical officer and the member's commanding officer, can successfully return to the specific stresses and environment of surface rescue swimmer duty.

## 1.22 CLASS IV PERSONNEL: PHYSICAL STANDARDS FOR APPLICANT AND DESIGNATED, ACTIVE DUTY AND DON/DOD-GS PERSONNEL THAT OPERATE UNMANNED AIRCRAFT SYSTEMS (UAS)

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Last Reviewed: Jul 2018

**\*Reference:** MANMED Chapter 15, Article 15-63

**\*Note:** (Civilian Contract Operators must abide by their individual contracts)

**UAS Groups:** Unmanned Aircraft Systems (UAS) are assigned to UAS Groups 1, 2, 3, 4, and 5 based on the aircraft's physical (gross weight) and flight (normal operating altitude and airspeed) characteristics according to OPNAVINST 3710.7 series (NATOPS). The assigned UAS Group is based on the UAS physical or flight attributes consistent with the highest numbered UAS Group. The aeromedical submission requirements are based on the assigned UAS Group.

**All UAS Groups:** Personnel performing any UAS operation must have no medical condition present, which may incapacitate an individual suddenly or without warning. Personnel may not perform any UAS operations while using medication whose known common adverse effect or intended action(s) affect alertness, judgment, cognition, special sensory function or coordination. This includes both over the counter and prescription medications. All personnel that operate UAS aircraft must meet general duty accession standards IAW MANMED Chapter 15, Section III, and the additional requirements below.

### **UAS Physical Worksheet (NAVMED 6410/13):**

<http://www.med.navy.mil/directives/Pages/NAVMEDForms.aspx>

**UAS Group 1 and 2:** Personnel that operate UAS Group 1-2 aircraft require a medical screening exam maintained locally. An applicant or designated qualification exam for UAS Group 1-2 only, can be completed locally by a qualified medical provider. The UAS Physical Worksheet must be completed locally, maintained locally, and uploaded into the DoD Electronic Health Record. Disqualifying conditions must be documented. Waiver consideration and approval for UAS Group 1-2 is accomplished by the local command and documented. Therefore, waiver recommendation and approval for UAS Group 1-2 can be completed locally. The UAS Physical Worksheet can also be uploaded with a NAMI submission as part of a Class I (Pilot) or Class II (NFO, Aircrew) physical/waiver if that qualification is also required and maintained.

**UAS Group 3, 4, and 5:** Personnel that operate UAS Group 3-5 aircraft require a complete Class IV flight physical with submission to NAMI as required. Waiver requests must be electronically submitted to NAMI and local waiver approval is not authorized. The UAS Physical Worksheet is to be completed and uploaded with the electronic submission to NAMI. An applicant physical must be electronically submitted to NAMI as a long-form with an Aeromedical Summary when required for waiver requests. UAS Group 3, 4, 5 designated physicals can be submitted to NAMI as electronic short form physicals in accordance with MANMED.

**Designated Class I and II Aviators:** Personnel that operate UAS aircraft who also have and continue to maintain a Class I (Pilot) or Class II (NFO, Aircrew) designation must follow physical qualification and submission requirements for their Class I or II physical if intended to be maintained. NAMI submissions must be for the Class I or Class II physical with clear notation regarding additional UAS Operator duties. The UAS Physical Worksheet must be uploaded to the associated AERO electronic physical and aeromedical summary. A member qualified (or a granted waiver) for Class I or II with a current upchit, must complete the UAS Physical Worksheet and attach to the appropriate electronic Physical and AMS. UAS Group 1 and 2 Operator Applicants can maintain this worksheet locally and upload to AERO for submission with subsequent physicals. UAS Group 3, 4, and 5 Operator Applicants must complete the UAS Physical Worksheet and upload it to a UAS Applicant Physical for electronic submission to NAMI. For designated UAS Operators with Class I or II designation, electronically submit the Class I or Class II physical to NAMI as required with the UAS Operator Duties clearly described in the physical and AMS.

**All personnel that operate UAS aircraft must meet general duty accession standards IAW MANMED Chapter 15, Section III, and the following Additional Requirements:**

**Vision:**

1. **Visual Acuity, Distant and Near:** No limit uncorrected. Must correct to 20/20 or better each eye. If the AFVT or Sloan Letter Crowded Chart is used, a score of 7/10 on the 20/20 line constitutes meeting visual acuity requirements.
  - a. The following visual corrections are not considered disqualifying (NCD):
    - (1) Non-surgical Corrections:
      - (a) Eye glasses
      - (b) Contact lenses
    - b. Corneal Refractive Surgery is considered disqualifying – Waiver applications may be considered IF the individual meets the parameters noted in the Aeromedical Reference & Waiver Guide, Chapter 12.15. The following are the only types of CRS considered for waivers:
      - (a) Photorefractive Keratectomy (PRK)
      - (b) Laser Sub-Epithelial Keratomileusis (LASEK)
      - (c) Laser-Assisted In-situ Keratomileusis (LASIK)
2. **Color Vision:** A validated PIP test at 12/14 (or better); or a passing grade on an approved and validated Computer-Based Color Vision Testing (CBCVT). All color vision tests will be administered as delineated in the NAMI Aeromedical Reference and Waiver Guide, Chapter 12.2. (The FALANT Test 9/9 or 16/18 may be considered for designated aviators who were designated before 31 December 2016).
3. **Oculomotor Balance:**
  - a. No esophoria more than 6.0 prism diopters
  - b. No exophoria more than 6.0 prism diopters
  - c. No hyperphoria more than 1.5 prism diopters
  - d. Tropia or Diplopia in any direction of gaze is disqualifying
4. **Field of Vision:** Must be full

5. **Depth Perception:** Only stereopsis is tested. Must pass any one of the following three tests:
  - a. AFVT: at least A-D with no misses
  - b. Stereo booklet (Titmus Fly or Randot): 40 arc second circles
  - c. Verhoff: 8/8 correct on the first trial or if any are missed, 16/16 correct on the combined second and third trials
  
6. **Intraocular Pressure:** Must be less than or equal to 22 mmHg. A difference of 5 mmHg or greater between eyes requires an ophthalmology consult, but if no pathology is noted, is not considered disqualifying.

**Speech:** Read Aloud Test: “Banana Oil” Test - No impediments  
a. IAW MANMED Chapter 15

**Reading Aloud Test:** The “Banana Oil” test is required for all applicants and other aviation personnel as clinically indicated.

“You wished to know about my grandfather. Well, he is nearly 93 years old; he dresses himself in an ancient black frock-coat, usually minus several buttons; yet he still thinks as swiftly as ever. A long, flowing beard clings to his chin, giving those who observe him a pronounced feeling of the utmost respect. When he speaks, his voice is just a bit cracked and quivers a trifle. Twice each day he plays skillfully and with zest upon our small organ. Except in winter when the ooze of snow or ice is present, he slowly takes a short walk in the open air each day. We have often urged him to walk more and smoke less, but he always answers “Banana Oil.” Grandfather likes to be modern in his language.”

**Pregnancy:** UAS/UAV personnel who are pregnant will fall under the same guidelines as Class III Air Traffic Control personnel.

# 1.23 APPLICANT CHECKLIST

Last Revised: Oct 2018

Last Reviewed: May 2017

	SNA	SNFO	Student: NFS,NAP NAEP, NAO,NAPA	AC (Rotary Wing)	AC F/W	ATC	APT	UAS
CXR	At accession or <3yr old			<3yr	<3yr	<3yr	<3yr	<3yr
Dental	Type I or II and Class I or 2							
Labs	<a href="#">ALL LABS ARE REQUIRED WITHIN 90 DAYS OF PHYSICAL DATE</a>							
Urine	Occult blood, Protein and Glucose by dipstick, Specific gravity							
Serology								
Chems	Cholesterol, HDL, LDL, Triglyceride, Fasting Blood Sugar							
Other Labs	HCT, HIV, Sickle Cell, G6PD							
HCT	Males: 40-52 Females: 37-47							
EKG	<a href="#">MUST BE DONE WITHIN 12 MONTHS OF PHYSICAL DATE</a>							
Anthropometrics	Must meet <a href="#">OPNAVINST 3710.37A</a> guidelines							
WEIGHT (See HT-WT charts)	Must meet Navy and Marine Corps weight and body fat standards. Weight cannot be <103 lbs or >245 lbs.					NAVY STD	NAVY STD	NAVY STD
BP ( <a href="#">Sitting</a> )	<140/90	<140/90	<140/90	<140/90	<140/90	<140/90	<140/90	<140/90
Pulse (Sitting)	<100, >45	<100, >45	<100, >45	<100, >45	<100, >45	<100, >45	<100, >45	<100, >45
DVA uncorr w/ corr	≤20/40-0 20/20-0	No Limit 20/20	No Limit 20/20	≤20/100 20/20	SEE SPECIAL	No Limit 20/20	No Limit 20/20	No Limit 20/20
NVA uncorr w/ corr	≤20/40 20/20	None 20/20	None 20/20	≤20/100 20/20	None 20/20	None 20/20	None 20/20	None 20/20
Slit Lamp Exam	Required							
Field of vision	Full	Full	Full	Full	Full	Full	Full	Full
REFRACTION Total Ref error astigmatism anisometropia	*Cyclo/Manifest +3.00/-1.50 +/-1.00 3.50	Manifest +/-8.00 +/-3.00 3.50	No Limit on refractive error. Record on exam					
Phoria	Eso ≤6, Exo ≤6 Hyper ≤1.5	No Obvious heteroTropia Or Symptomatic heteroPhoria (NOTOSP / NOHOSH)						SAME AS SNA
Color	PIP must pass with 12 or more correct of 14 plates; or a passing score on an approved computerized color vision test						NOT REQUIRED	SAME AS SNA
Depth	AFVT A-D Verhoeff 8/8 RANDOT or Titmus to ≤40 sec of arc	DEPTH PERCEPTION TESTING IS NOT REQUIRED	NOT REQUIRED	SAME AS SNA	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED	SAME AS SNA
IOP	≤ 22 mm Hg and must be no more than 4 mm Hg difference between eyes							
Audiogram	ALL APPLICANTS MUST MEET SNA HEARING STANDARDS 500HZ 25db 1000 HZ 25db 2000 HZ 25db 3000 HZ 45db 4000 HZ 55db							
Special	**Corneal Mapping (topography/ Pentacam) required	Passing 7/10 on 20/20 line is considered 20/20 for Class 2, 3, and 4 applicants Enlisted Naval Aircrew (NAC) >20/100 uncorrected shall be PQ for fixed wing only.				Reading Aloud Test Required	Submit sinus x-rays	
**SNA Topography	SNA applicants must have corneal mapping performed (topography or Pentacam) to rule out ectatic disease (i.e. keratoconus): If irregular pattern or the INFERIOR:SUPERIOR (I/S) ratio in central 6 mm of cornea (3mm above, 3 mm below center) is > 1.5, submit to NAMI for review.							
*SNA Refraction	(1) Manifest refraction is required only for SNAs who are NOT 20/20 -0 on Goodlite in each eye. (2) All SNAs require cycloplegic (1% cyclopentolate) refraction to assure ≤ +3.00 D sphere only. NOTE: there is NO standard for astigmatism (CYL) or Visual Acuity on cyclo refract.							
Fleet Accessions	Physical exam must have been completed within 12 months							
NFO to Pilot transition	Must meet SNA standards Physical exam must be within 12 months unless specified otherwise in announcement							

## 1.24 DESIGNATED CHECKLIST

Last Revised: May 2017

Last Reviewed: May 2017

Item	SG I	SG II	SG III	NFO, NFS NAP, NAEP, NAC, NAPA	A/C ROTARY WING USN/USMC	A/C FIXED WING USN/USMC	APT	ATC	UAS	
DVA (SEE NOTE)	20/100 OR BETTER CORR TO 20/20-0	20/200 OR BETTER CORR TO 20/20-0	20/400 OR BETTER CORR TO 20/20-0	NO LIMIT CORR TO 20/20	20/100 OR BETTER CORR TO 20/20	NO LIMIT CORR TO 20/20	NO LIMIT CORR TO 20/20	NO LIMIT CORR TO 20/20	NO LIMIT CORR TO 20/20	
NVA	NO LIMIT PROVIDED CORRECTABLE TO 20/20. MUST CARRY NEAR CORRECTION IF WORSE THAN 20/40.									
REF ERROR	NO LIMIT ON REFRACTION. PERFORM MANIFEST ON DVA >20/20									
PHORIAS	6.0 ESO 6.0 EXO 1.5 HYPER			No Obvious heteroTropia Or Symptomatic heteroPhoria (NOTOSP / NOHOSH)					SAME AS SG1	
DEPTH PERCEPTION	MUST PASS ONE OF: AFVT A-D, VERHOEFF 8/8 OR 16/16, RANDOT AND TITMUS ≤40 SEC OF ARC			NOT REQUIRED	SAME AS SG1	NOT REQUIRED	NOT REQUIRED	NOT REQUIRED	SAME AS SG1	
COLOR VISION	PIP must pass with 12 or more correct of 14 plates; or a passing score on an approved computerized color vision test. (FALANT: 9/9 or 16/18 for mbrs designated before 31 DEC 2016)						NOT REQUIRED	SAME AS SG1	SAME AS SG1	
IOP	Must be ≤ 22mmhg and no more than 4 difference between eyes. Perform on all examinations									
ECG	Required Every 5 years at ages 25, 30, 35, 40 till age 50 then annually on all aviation duty physical exams.									
URINE	<b>EVERY FIVE YEARS:</b> OCCULT BLOOD, PROTEIN, AND GLUCOSE BY DIPSTICK									
BLOOD TESTS	ANNUALLY: HIV <b>EVERY FIVE YEARS:</b> HCT, CHOLESTEROL, HDL, LDL, TRIGLYCERIDES, FASTING BLOOD SUGAR									
CXR	REQUIRED ONLY WHEN CLINICALLY INDICATED									
B/P	SITTING ONLY REQUIRED. MUST BE LESS THAN 140/90									
PULSE	MUST BE <100 AND >45, IF <45 DOCUMENT APPROPRIATE CARDIO RESPONSE TO EXERCISE									
AUDIO	FREQ	BETTER EAR	WORSE EAR							
	500HZ	35DB	35DB							
	1000HZ	30DB	30DB							
	2000HZ	30DB	50DB							
SPECIAL	<p><b>Interservice Transfer:</b> Physical exams must be less than one year old, and must be sent to BUMED M3F1 for commissioning endorsement before aviation determination can be made.</p> <p><b>NFO to Pilot transition program:</b> Refer to SNA standards</p>									
NOTE	DVA of 20/20 in Class 1 personnel is 20/20 with zero misses on 20/20 line. DVA of 20/20 in Class 2, 3, and 4 personnel is considered 20/20 with up to 3 misses on 20/20 line (7/10). All aviation personnel must wear their corrective lenses if needed to meet class vision standards. If uncorrected DVA is worse than 20/100, they must carry an extra pair of spectacles. Members who wear contact lenses to fly must also carry backup spectacles that correct vision to 20/20.									

# AEROMEDICAL TECHNICAL BULLETIN

## Reading Aloud Test

### **Background:**

Administer the reading aloud test (RAT) to aviation training applicants as a standardized assessment of an individual's ability to communicate clearly in the English language, in a manner compatible with safe and effective aviation operations. Current communication systems degrade speech intelligibility. The radio environment separates the speaker and the listener from the benefits of watching lips and body language cues. Those with marginal English skills have problems communicating effectively in the operational aviation environment.

Failure of the screening RAT by applicants with English as their native language may indicate undiagnosed or concealed learning disabilities. Administration of the RAT occasionally reveals immature, indecisive, careless, or excessively introverted personalities, which may indicate a high risk for aviation training failure.

When administered to aviation personnel, to include ATC personnel, the RAT will be used to determine the individual's ability to clearly enunciate, in the English language, in a manner compatible with safe and effective aviation operations.

The RAT appears to be a nonsense story, but was designed as a phonetic exercise. Assessment by the flight surgeon (or Aeromedical Examiner or Aeromedical Physician Assistant) is subjective. Applicants should read the RAT clearly, deliberately, without hesitation, error, or stuttering. The test is scored as "RAT-PASS" or "RAT-FAIL." The examining physician will consult with a local instructor pilot or ATC supervisor in questionable cases.

### **Procedure:**

Have the examinee stand erect, face the examiner across the room and read aloud, as if he/she were confronting a class of students.

If he/she pauses, even momentarily, on any phrase or word, the examiner immediately and sharply says, "What's that?" and requires the examinee to start again with the first sentence of the test. The true stammerer usually will halt again at the same word or phonetic combination and will often reveal serious stammering.

Have the applicant read aloud as follows:

"You wished to know all about my grandfather. Well, he is nearly 93 years old; he dresses himself in an ancient black frock coat, usually minus several buttons; yet he still thinks as swiftly as ever. A long flowing beard clings to his chin giving those who observe him a pronounced feeling of the utmost respect. When he speaks, his voice is just a bit cracked and quivers a trifle. Twice each day he plays skillfully and with zest upon our small organ. Except in winter when the ooze of snow or ice is present, he slowly takes a short walk each day. We have often urged him to walk more and smoke less, but he always answers, "Banana oil!" Grandfather likes to be modern in his language."