GUIDELINES FOR EXAMINATION BY AN
OPHTHALMOLOGIST FOR APPLICANTS FOR
ENTRY TO THE AUSTRALIAN DEFENCE FORCE IN
AN AVIATION-RELATED OCCUPATION

1. An applicant will require at least one appointment with an
ophthalmologist. Two appointments are needed if contact
lenses are worn as the preferred method of visual correction
most of the time. Contact lenses must not be worn for 48 hours
prior to examination.

2. The initial ophthalmology assessment is valid for twelve
months. If more than twelve months but less than 24 months
have elapsed between the date of the initial ophthalmology
assessment and entry to the Australian Defence Force (ADF), a
review assessment may be conducted by an optometrist unless
there are clinical indications for ophthalmology examination. If
more than 24 months have elapsed the review must be
conducted by an ophthalmologist.

3. The ophthalmologist or optometrist is to record
examination details required to allocate an aviation visual
requirement (AVR) for all applicants on Form PM86 Eye
Examination—Aviation.

4. Ophthalmologists and optometrists should ensure that
they have a copy of the following information and
documentation:

a. Australian Defence Force Aviation Visual
Requirements
b. Guidelines for examination by an ophthalmologist for applicants for entry to the ADF in an aviation-related occupation. (This paper).

c. Eye Examination—Aviation Form PM86

d. The documents are also available on the Royal Australian and New Zealand College of Ophthalmologists website at www.ranzco.edu and the Australian Optometrist Association website at www.optometrists.asn.au/.

FIRST APPOINTMENT

5. At the first appointment, the candidate should present with their glasses and/or contact lenses.

6. The examination is to include:

   a. External eye examination:

      (1) visual acuity (VA)/refractive error distance and near;

         (a) manifest hypermetropia,

         (b) accommodation, and

         (c) convergence.

      (2) ocular muscle balance to include:

         (a) cover test, and

         (b) Maddox Rod Test;
(3) visual fields;
(4) intra-ocular pressures;
(5) colour perception (CP); and
(6) near vision.

b. Internal examination. Examination under cycloplegia of the clear media and fundus of the eye. Cyclopentolate HC 1 1% is to be used.

7. The eye examination is to be conducted in accordance with the guidelines below.

EXTERNAL EYE EXAMINATION

Refraction

8. To test for refraction, the degree of hypermetropia or myopia is measured by an ophthalmologist.

Accommodation

9. To test for accommodation, Foster’s Near Point Rule (Royal Air Force (RAF) Gauge) is to be used. Each eye is tested separately. The examiner holds the handle and pushes the drum containing the types away from them to a point as near to the subject as possible. They turn the N-types towards the subject, and place the shaped face piece below the infra-orbital margins. The subject is instructed to read out the smallest print they can see, and as the drum is moved at a steady slow speed away from the eyes, they are instructed to say when the smallest print first becomes clear to read correctly. This distance, shown by the rear edge of the slide carrying the drum, is recorded in centimetres.
Convergence

10. To test for convergence both eyes are left uncovered when using Foster’s Near Point Rule (RAF Gauge). The test card bears a line and dot. This target is moved towards the subject who is instructed to say when the line becomes, not blurred, but double. This is the subjective convergence, and this distance is recorded in centimetres. At some point on the scale, one eye is seen to hesitate in its convergence, and then suddenly to diverge. This is the objective convergence, or near point of convergence, and its distance is recorded in centimetres. These two measurements may or may not coincide and doubling of the line may or may not be noticeable to the subject.

Cover test

11. The cover test indicates the presence or absence of a small angle strabismus. The test is to be conducted as follows:

a. The subject is requested to look steadily at the examiner’s right eye. The examiner observes the subject’s left eye and passes an opaque material before the subject’s right eye.

b. The examiner notes whether any movement occurs at the moment of fixation of the subject’s left eye. If no movement is noted then the subject must be binocular, but if a refixation movement is noted, then a small angle strabismus is present.

c. Similarly, while testing the subject’s right eye, the examiner observes the subject’s right eye while covering the subject’s left eye.
d. On removing the cover from either eye any deviation of the eye is noted and the recovery to binocular fixation is noted as rapid/slow/nil.

**Maddox rod test.**

12. With the Maddox Rod Test, heterophoria and its degree estimated both for distance and near, may be detected. The present day Maddox Rod is a disc of red glass on the surface of which are cut a number of grooves. These grooves have the property of converting a spot of light into a line, the direction of which is at right angles to the direction of the grooves. The use of this disc presents dissimilar images to the eyes, thus fusional control of the extra-ocular muscles is prevented and the covered eye takes up its position of rest. In heterophoria as the eye reverses and inverts images, the red line appears to go in the opposite direction to the movement of the eye. Therefore, with the Maddox Rod before the right eye the following result would be indicated:

a. Red line to applicant’s right of light—Esophoria (Eso).

b. Red line to applicant’s left of light—Exophoria (Exo).

c. Red line above—Left hyperphoria (L Hyper).

d. Red line below—Right hyperphoria (R Hyper).

13. **Method of test.** The method of testing is as follows:

a. With the applicant looking, with both eyes open, at a spotlight at a distance of six metres, the Maddox Rod is placed in a trial frame before the right eye
with the grooves horizontal. If binocular vision is present a vertical red line is seen by the right eye and the spotlight by the left eye. The applicant is asked to which side of the spotlight the red line lies. Increasing powers of prisms are placed before the right eye, with the base of the prism towards the side on which the red line lies, until the red line appears to pass through the spotlight. The power of the prism, in prism dioptres, and the type of horizontal heterophoria it has corrected are recorded.

b. The test is repeated with the grooves vertical, producing a horizontal red line, and the degree of hyperphoria recorded, if any.

c. If the red line passes through the spotlight in both (a) and (b) above, the response is orthophoric (ortho).

14. **Common errors.** The following common errors are to be avoided:

a. The applicant shuts one eye.

b. The applicant does not relax to focus on the distant spotlight. Too high a degree of esophoria is indicated, which does not match the deviation detected by the Cover Test.

c. Multiple red lines seen because aberrant light sources are present. If the examination room cannot be blacked out the proper red line should be indicated by flashing the spotlight on and off a few times. White Maddox Rods are available for use
with a red spotlight, aberrant light leaks producing white lines and the spotlight a red line.

d. Falsification by the applicant. Heterophoric applicants who know the test may declare immediately that the line passes through the light. If, following the Cover Test, orthophoria appears unlikely, a prism should be placed in an appropriate direction before the Maddox Rod. If orthophoria is still claimed, a closer check of the applicant’s responses is indicated.

Visual fields

15. Confrontation is generally acceptable. If clinically indicated, computerised perimetry is required.

Near vision testing

16. Applicants for aviation-related occupations are required to undergo near vision testing. The recommended near vision test procedure is to use the Sussex Vision Rayner near vision testing card which displays the N series of letters (faculty approved N5 to N48).

SECOND APPOINTMENT

17. When a second appointment is required the candidate should present in contact lenses after having worn them for at least four hours. The candidate should also be instructed to bring their spectacles to the second appointment. The ophthalmologist should assess the following:

   a. VA wearing contact lenses; and
b. spectacle blur; ie the vision in glasses immediately upon contact lens removal.

18. **Contact lenses.** A candidate who wears contact lenses may be accepted if:

   a. the MVR is satisfactory,
   
   b. there is no pathological condition of the eyes,
   
   c. the existing contact lenses are suitable for the proposed employment, and
   
   d. the wearing of contact lenses is not obligatory and spectacles can be substituted.

**Refractive surgery**

19. Whilst refractive surgery provides an excellent alternative to the wearing of spectacles or contact lenses, it is important to understand that it is NOT a means for applicants to overcome uncorrected refractive errors which are outside existing ADF entry standards. Applicants must not be advised to have refractive surgery as a means of meeting ADF entry standards if they are outside of the required uncorrected MVR limits.

20. Any aircrew applicant who has had refractive surgery must meet the following requirements:

   a. Applicants who have had Radial Keratotomy, orthokeratotomy or the implantation of phakic intra-ocular lens are not acceptable for ADF entry. Only Photo Refractive Keratotomy, or Laser Epithelial Keratomileusis or Laser in-situ keratomileusis (LASIK) are acceptable procedures for entry as Air Traffic Control. LASIK is not an acceptable
procedure for entry for aircrew or Air Defence Officers.

b. At least three months must have elapsed post surgery.

c. At least six months must have elapsed post surgery for aircrew applicants who have undergone refractive surgery to correct hyperopia.

d. Two refractions are to be performed post surgery by an ophthalmologist, at least one month apart, with less than 0.5 dioptres of refractive difference, and less than 10 degrees of axis deviation, between the two measurements in the same eye.

e. They must have no history or evidence of unwanted symptoms or post-operative effects including but not confined to:

   (1) decrease in best corrected VA;

   (2) raised intra-ocular pressure;

   (3) reduced contrast sensitivity;

   (4) corneal ulcers;

   (5) pain;

   (6) blurred vision;

   (7) glare or flare;

   (8) halos around lights or objects;
(9) night vision;

(10) aberrations;

(11) no alteration in CP, etc; and

(12) with special note of the absence of corneal aberrations and corneal haze.

f. They must have discontinued the use of all topical eye drops including steroids or anti-inflammatory agents but artificial tears may be used as needed.

g. They must meet all vision standards of the trade or specialisation.

21. Applicants who present for enlistment/appointment into the ADF and who declare a history of refractive surgery, are to provide full details of their pre and post-operative refractions as well as details of after-care from their provider. Whilst refractive surgery provides an excellent alternative to the wearing of spectacles or contact lenses, it is important to understand that it is NOT a means for applicants to overcome uncorrected refractive errors which are outside existing ADF entry standards.

22. Applicants must not be advised to have refractive surgery as a means of meeting ADF entry standards if they are outside of the required MVR limits. It is important to recognise that refractive surgery has the potential to conceal pre-operative refraction below the visual standard required for entry and will not be detectable during routine examination at the DFRC. Where doubt exists, the applicant is to be referred to an ophthalmological consultant for assessment including corneal mapping.
23. If a DFRC Medical Officer has doubts that an applicant who has not declared a history of refractive surgery may have had refractive surgery, the applicant is to be referred to an ophthalmologist for an assessment, which is to include corneal mapping.

**Assessment of applicants referred with a history of night vision problems**

24. Good night vision is essential for all members of the ADF, in particular those personnel required to operate in the field using tactical lighting or night vision devices. Poor or degraded night vision could be a major safety concern in ADF operations.

25. From time to time applicants for the ADF may be required to have an assessment of their night vision because of a history of difficulty seeing at night. As there are no readily available screening tests for true night blindness, an assessment by an ophthalmologist is considered essential to exclude known causes of night blindness; eg retinitis pigmentosa; vitamin A deficiency, prescribed medication (eg anti malarials) diabetes, cataract, macular degeneration, severe myopia, etc. If the history and ophthalmological assessment supports the diagnosis of true night blindness or a related condition, where night vision is compromised the applicant will be considered unsuitable for entry.