Australian Government
Civil Aviation Safety Authority

Appendix A – Flight Examiners Handbook

Australian Operational Colour Vision Assessment (AOCVA)

The aim of the Australian Operational Colour Vision Assessment (AOCVA) is for the applicant to demonstrate competency in recognising, interpreting, and reacting to colour coded visual cues in an operational aviation environment.

Satisfactory performance indicates that the candidate has met the requirements of paragraphs 67.150 (6) © and 67.155 (6)(c) of the *Civil Aviation Safety Regulations 1998 (CASR)* and can correctly identify all relevant coloured lights in a test that simulates an operational situation.

Examiner Requirements

The following examiner requirements are applicable to the conduct of the AOCVA:

Examiners must hold a minimum Night VFR (NVFR) or Instrument Rating (IR) testing endorsement on their Part 61 Flight Examiner Rating (FER) or equivalent CASR 61.040 approval.

Examiners must hold a current Examiner Proficiency Check (EPC) prior to conducting an AOCVA.

Examiners must complete an initial training course and be specifically authorised by CASA to conduct AOCVA.

Examiners must themselves have passed at their most recent aviation medical examination the Ishihara pseudo-isochromatic plate test or other CASR 67.150 (6)(c) Tier 1 assessment of colour vision as determined by CASA.

The examiner must conduct the AOCVA in accordance with the operational scope and conditions as described below.

Applicant requirements

The following applicant requirements are applicable to the conduct of the AOCVA:

Applicants are not required to hold a Pilot Licence to attempt the AOCVA, but are encouraged to have a basic level of exposure and understanding of the operational environment in daylight and night conditions prior to undertaking the AOCVA. Applicants with limited flying experience are encouraged to make contact with an approved AOCVA examiner to discuss the requirements of the assessment.

Applicants must hold a current Class 1 or 2 medical certificate, having first undertaken and failed both the pseudo-isochromatic plate test and Farnsworth Lantern test (or other CASR 67.150 (6)(c) Tier 1 and 2 assessments of colour vision as determined by CASA).

Applicants are not permitted to wear colour corrective lenses for either the ground or flight components of the AOCVA.

Plan

Assessment methodology

The examiner must apply the flight test methodology described in the *CASA Flight Examiner Handbook* chapter 3, Adult education and competency-based assessment.

The examiner must confirm that an applicant undertaking the AOCVA satisfies the eligibility requirements to undertake the assessment, including ensuring photographic identification containing a signature is produced (e.g. passport or driver's licence).

AOCVA is not an assessment of the applicant's flying ability. Depending on experience level, an applicant may elect to fly some or all of the flight component or use an autopilot if available. This must be discussed between the examiner and the applicant during the pre-flight briefing stage.

The assessment should be designed such that all required components can be completed in a logical sequence. All items on the AOCVA assessment form must be completed successfully to achieve an overall pass result. Any deviation from the standard sequence will invalidate the assessment result.

The matrix in Table 1 describes the recommended flight phase where assessment of the required items can occur. Many of these items may be assessed over several flight phases and therefore the examiner must confirm that the applicant can reliably and repeatedly identify and respond to colour coded visual cues under a variety of conditions and in a safe and timely manner.

Table 1. Assessment of activities and sequences – AOCVA

Item	Flight Phase					
	Pre Flight	Taxiing	Departure	Cruise	Approach & Landing	PAPI
	Ground Component	Flight Component - General				Flight Component - PAPI
a) Read and interpret aeronautical charts	✓			✓		
b) Read and interpret flight instruments and displays		✓	✓	✓	✓	
c) Recognise and interpret aerodrome ground markings		✓				
d) Recognise and avoid other aircraft		✓	✓	✓	✓	
e) Recognise and avoid terrain and obstructions			✓	✓	✓	
f) Identify location and interpret significance of aeronautical lights at night		✓	✓	✓	✓	
g) Identify and interpret PAPI signals during approach						✓

Examiners must not ask the applicant to name colours, because people who have been assessed as having a colour vision deficiency may interpret colour differently to people who have been assessed as "colour normal". Rather, the examiner conducting the assessment must confirm that the applicant can correctly and consistently, interpret the meaning of information conveyed by maps, charts, plates, instruments, lights, aerodrome markings and be able to assess terrain conditions and obstructions on the ground and in the air.

Correct interpretation of all assessment items must be achieved by the applicant in a 'timely manner'. This is defined as the amount of time appropriate to the given operational scenario to correctly identify, trap and/or action a visual cue such that safety is not compromised. It requires the applicant to be able to respond appropriately and without undue hesitation. Response times should be such that in the examiner's opinion, a person with normal colour vision would be expected to achieve the same response under identical conditions. For the AOCVA to be passed:

- For elements that are not time-critical, where a pilot can expect to be able to seek other sources of information and verification of colour-coded information, or mis-identifying the colour-coded information will not result in an irretrievable unsafe situation, the response must be accurately verbalised within 10 (ten) seconds of the question.
- The element that is time-critical, where no other information is available and misidentification may result in an irretrievable unsafe situation, is the PAPI element. The response must be accurately verbalised in 3 (three) seconds from the time the examiner mentally confirms a steady PAPI indication. The examiner must not give any verbal indication of this timeframe to the applicant during the assessment.

The AOCVA is not a check of aeronautical knowledge. The use of legends, notes and glossaries on maps, charts and plates is permitted. The interpretation of warning or caution lights must recognise the nature of the light and not the actions or drills associated with it. Where external lighting or aerodrome markings are observed, the applicant must be able to recognise it in a way that allows its function to be clearly stated and the appropriate action taken. In the air, examiners must assess whether any incorrect applicant actions are due to a lack of ability/experience, or as a result of misinterpreting visual cues. This should be achieved by thorough questioning on what the applicant is observing and how they are reacting to such information. Manoeuvres must be repeated as necessary to confirm assessments.

Conduct (Perform assessment components)

Assessment scope and conditions

The AOCVA must be conducted independently and cannot be combined with any other flight training, testing or proficiency checking activity. It must be conducted in an aircraft. The use of a flight simulation training device (FSTD) is not permitted unless in exceptional circumstances and must be approved by CASA.

Aeronautical chart reading in the Ground Component may be performed under any light condition where the chart will normally be read. The examiner must provide the aeronautical chart.

All items in the Flight Component – General part of the above Table 1 must be assessed in both day and night conditions and must be conducted in VMC conditions. The time of day and actual in-flight meteorological conditions must be recorded on the AOCVA test form. Conducting the flight in the presence of reduced visibility may make the test more difficult for the applicant to pass. If meteorological conditions are less than ideal, the applicant may elect to reschedule the test.

The Flight Component – PAPI must be conducted in day VMC conditions.

For the Flight Component – PAPI, if the examiner determines that the function of the PAPIs is not suitable for this test environment, they may terminate the assessment and make alternative arrangements for the AOCVA. The PAPI must be set for a standard 3-degree approach path for the AOCVA to be valid.

The AOCVA assessment must be undertaken in an aircraft approved for the purpose, which is fitted with the appropriate range of flight instruments and displays for the completion of the assessment tasks and is capable of being operated for the kind of operations relevant to the items to be assessed. The AOCVA must be conducted in an aircraft that is type-certified; limited category or restricted aircraft (such as military, experimental, or historical aircraft) are not permitted.

It is recommended that the examiner plans an assessment time of at least:

- 0.8 hours for the day flight component and 0.8 hours for the night flight component. These flight times should not include time delays which may be experienced at a busy Class C or D airport).

The recommended flight times described above will vary depending on the applicant's experience level and are an indicative minimum for an applicant only holding a basic RPL. Candidates holding a PPL, CPL or ATPL may be able to achieve the required assessment competencies in considerably less time.

Regardless of actual flight time or applicant experience level, all items on the AOCVA must be completed to achieve a pass result.

Complete (post flight)

Debriefings

The examiner must debrief the applicant as soon as practicable after the conclusion of the flight component.

In the event of a failure assessment, in addition to the verbal debriefing, the examiner should ensure sufficient comments are entered into the applicant's AOCVA assessment form explaining the reasons.

Assessment outcomes

If the examiner determines that a failure result is warranted during any element of the assessment, the AOCVA must be terminated. The examiner must clearly document the specific failure items on the assessment form.

An applicant will be assessed as failing an AOCVA if they are unable to reliably and consistently distinguish and respond to colour coded visual cues in a safe and timely manner. Examples of failure items include, but are not limited to:

- failure to identify and interpret significant features on an aeronautical chart
- failure to identify and interpret cockpit instruments and displays
- failure to identify and interpret the significance of aerodrome ground markings, signage or lighting
- failure to identify and describe terrain features and obstacles, especially hazardous ones such as powerlines
- failure to identify other aircraft and recognise their direction of travel
- failure to identify and describe differences in PAPI signals during an approach in accordance with the assessment requirements

In the event of a failure assessment, and subject to the satisfactory acquittal of any examiner recommendations, an applicant will only be permitted one further attempt at the failed element of the AOCVA. In this instance, the assessment element must be completed again in full.

If they do not pass the Flight Component - General, they may not proceed to the Flight Component – PAPI element and the AOCVA result is recorded as "fail".

An applicant will be assessed as failing the Flight Component – PAPI if they are unable to accurately interpret the operational information conveyed by the PAPI in the required timeframe on any of runs 2 through 5 (see detailed instructions below). If an error is made on any one of runs 2 through 5 the result is recorded as a fail and the assessment is terminated at that point.

For this test, the required timeframe for the applicant to verbalise the change in PAPI indication is three (3) seconds from the moment when the examiner observes the change in PAPI indication.

If the applicant does not pass the PAPI component of the AOCVA on their first attempt, they are eligible for one further attempt to pass the PAPI component of the AOCVA. The second attempt must be conducted as a separate assessment (that is, not during the same flight). If they do not pass the Flight Component – PAPI, the AOCVA result is recorded as "fail".

On completion of a valid AOCVA, the result is enduring, and the candidate may not undergo further assessment unless in exceptional circumstances approved or directed by the CASA Aviation Medicine section. These circumstances must include the advice of a consultant ophthalmologist confirming that the

initial test was invalid due to the presence of a non-congenital colour vision deficiency, and/or there has been a material change in their health that means the result of a further AOCVA may be different to their initial AOCVA assessment.

Administrative action

At the conclusion of the AOCVA, the examiner must:

- within 14 days after the day of the AOCVA, complete the assessment form and provide a copy of the report to the applicant and CASA (avmed@casa.gov.au)

All items on the assessment form must be marked to indicate the assessment outcome. Each element has the option for Yes (pass) or No (fail).

Upon receipt of a completed AOCVA assessment form indicating a valid result, CASA will review the medical certificate application and remove or amend any restrictions or conditions related to colour vision status. CASA Aviation Medicine Clinical Practice Guideline – Colour Vision Deficiency specifies the restrictions and conditions that may be applied to aviation medical certificates relating to colour vision deficiency test outcomes.

Conduct of the AOCVA Ground Component

Initial brief to the applicant

In accordance with the Flight Examiner Handbook – Chapter 3 (Adult education and competency-based assessment), the examiner must begin the assessment with a brief to the applicant on the following items:

- AOCVA context, purpose and content
- assessment procedure
- function of the examiner
- standards against which competency will be assessed
- actions in the event of a failure assessment

The applicant should be encouraged to ask for clarification should they become uncertain on any of the assessment elements.

Document review

The examiner must confirm that an applicant undertaking an AOCVA satisfies the eligibility requirements to undertake the assessment. To achieve this, the logbook, licence and medical certificate must be checked. Ideally, these documents must be presented to the examiner prior to the commencement of the AOCVA.

Medical certificate – the examiner must check that the applicant holds either a class 1 or 2 medical certificate and must confirm that they have previously failed the Tier 1 and Tier 2 tests of CASR 67.150 (6)(c) or CASR 67.155 (6)(c).

If the AOCVA is a retest following a previous fail assessment – the examiner must review the assessment record of the initial AOCVA assessment.

Assessment of aeronautical chart reading

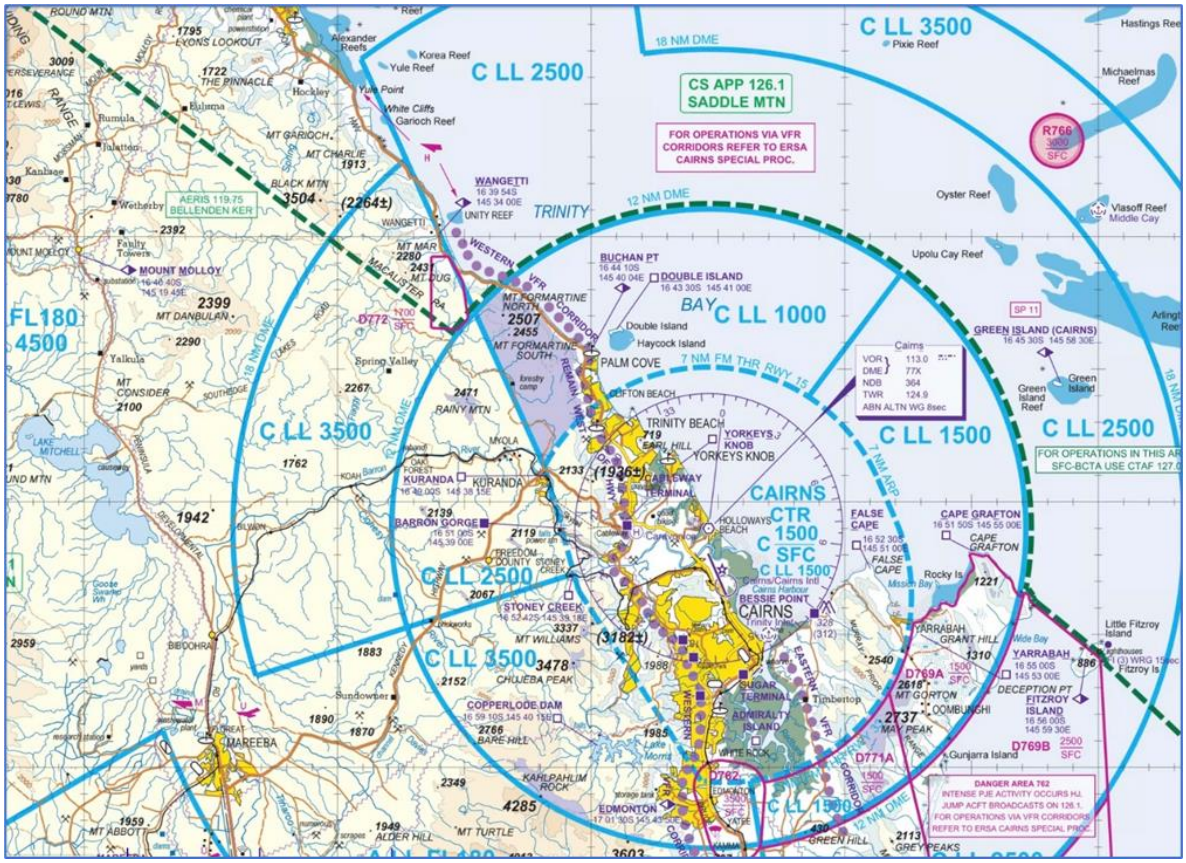
To achieve a satisfactory performance, the applicant must read and correctly interpret aeronautical charts in a timely manner. This chart reading may be performed under any light condition where a chart will normally be read. This may include in a briefing room environment, outdoors or inside an aircraft. The examiner must provide a current Visual Terminal Chart (VTC) in either electronic or printed format for this purpose.

Ask the applicant to describe the text, symbology, terrain and airspace markings visible, starting from the top left corner and working across the chart. The legend may be used to assist the applicant if needed. Should the applicant appear to have difficulty in observing any markings on the chart, the examiner should utilise open ended questions to ascertain if there is a genuine inability to see markings or if a simple omission was made. For example, the examiner should point to a particular area on the chart and ask what text or symbols the applicant sees and what their significance is.

While there is no requirement to name colours on the chart, the applicant must be able to readily differentiate between areas of similar appearance, such as airspace boundaries or terrain contours.

More experienced applicants may use appropriate aviation language in describing what is presented on the chart, while those with less experience may need to describe their observations in layman’s terms and with reference to the chart legend.

Figure 1. Example Visual Terminal Chart



Read and interpret flight instruments and displays

To achieve a satisfactory performance, the applicant must interpret aircraft flight instruments and displays in a timely manner, particularly those with coloured markings, caution/warning lights and other associated displays. The following general guidance is provided, and examiners should assess applicants as appropriate depending on aircraft instrumentation configurations.

Airspeed indicator (ASI) – Seated in an aircraft, direct the applicant's attention to the ASI. Ask the applicant to describe what they observe on the face of the instrument, including any digits, circumferential bands or radial markings. The applicant is not required to name colours; however, they must be able to read the numbers on the instrument display and state the start and end points of any coloured bands. They should also be able to differentiate between adjacent or overlapping bands and radial markings. The terminology used to describe any markings may vary depending on the applicant's aviation knowledge and experience.

Figure 2. Airspeed Indicator

Attitude Indicator (AI) – Seated in an aircraft, direct the applicant's attention to the AI. Ask the applicant to describe what they observe on the face of the instrument, including descriptions of any markings and coloured hemispheres. The applicant is not required to name colours; however, they must be able to accurately describe the layout of markings on the instrument and be able to differentiate between the colour hemispheres.

Figure 3. Attitude Indicator

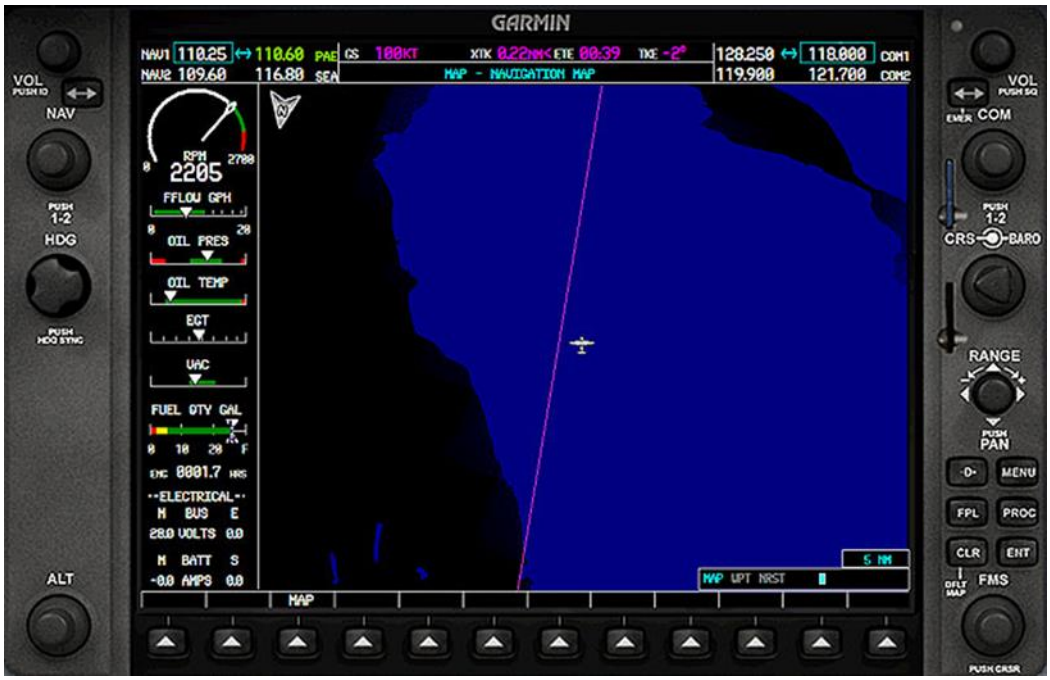
RPM gauge – Seated in an aircraft, direct the applicant's attention to the RPM gauge. Ask the applicant to describe what they observe on the face of the instrument, including descriptions of any numbers, coloured bands and radial markings. The applicant is not required to name colours; however, they must be able to accurately describe the layout of the markings on the instrument.

Figure 4. RPM Gauge

Electronic Flight Instrument System (EFIS) displays – Seated in an aircraft, direct the applicant's attention to any EFIS style instrumentation. This may include primary flight displays, navigation displays, engine indication displays and radio displays. Ask the applicant to describe what they observe on the display, including any numbers, airspeed and altitude tapes, attitude indicators, engine performance data, map representations and anything else the examiner considers to be relevant. The applicant is not required to name colours; however, they must be able to accurately identify information presented and be able to differentiate between coloured displays in a way that enables them to interpret it's meaning and relevance. The terminology used to describe presentations and markings may vary depending on the applicant's aviation knowledge and experience.

Figure 5. EFIS (G1000 Primary Flight Display)

Figure 6. EFIS (G1000 Multifunction Display)



Conduct of the AOCVA Flight Component - General

Intent

The Flight Component – General assesses the applicant's ability to interpret the colour-coded markings and indicators required to:

- Recognise and interpret aerodrome ground markings,
- Recognise and avoid other aircraft, and
- Identify location and interpret significance of aeronautical lights at night.

Pre-flight briefing

In accordance with the Flight Examiner Handbook – Chapter 3 (Adult education and competency-based assessment), the examiner must begin the assessment with a brief to the applicant on the following items:

- flight component sequences and the assessable items
- pilot in command
- transfer of control
- flight tolerances and ground references
- weather and NOTAMs
- actions in the event of a real emergency

The applicant should be encouraged to ask for clarification should they be uncertain about any of the briefed items.

Assessment of activities and sequences

An examiner must comply with the requirements and consider the recommendations described below when planning and conducting the AOCVA.

The following expanded guidance should be used by examiners to ensure all AOCVA items are accurately assessed.

Recognise and interpret aerodrome ground markings, terrain and obstructions

To achieve a satisfactory performance, the applicant must recognise terrain and obstructions in a timely manner, including airport signage and markings and emergency landing fields.

Airport signage and markings - While seated in a taxiing aircraft, ask the applicant to describe markings and signage in the airport environment. This may include holding points, taxiways signs, taxiway centre lines and runway markings.

Figure 7. Runway holding point and taxiway signage and markings

Emergency landing fields - While seated in an aircraft flying at an altitude of approximately 2,000 ft AGL, ask the applicant to describe a chosen field and describe the surface (e.g., sod, stubble, ploughed field, presence of terrain roll or pitch, if any); and also describe how the conclusions were determined. Further, ask the applicant to identify obstructions such as ditches, fences, terraces, low spots, rocks, stumps, livestock, and, in particular, any grey, tan, or brown objects in green fields.

The chosen field should be clearly visible to both the examiner and the applicant. Depending on an applicant's aviation knowledge and experience, they may be able to discuss their observations with greater fluency and to a greater depth. For inexperienced applicants it may be necessary to undertake more detailed and probing questioning such as "point out fence lines, drains, powerlines, cattle, etc."

The process should be repeated for several fields as required until such time as the examiner has confirmed whether an applicant can reliably describe the surface. The examiner may also elect to fly a simulated forced landing without power or a precautionary overfly to an unsuitable field and confirm the applicant can identify the relevant hazards.

This component is only required to be conducting during the day.

Figure 8. Potential emergency landing field

Identify location and interpret significance of aeronautical lights at night

To achieve a satisfactory performance, the applicant must visually identify the location and significance of aeronautical lights at night in a timely manner. To minimise the effect of the applicant memorising the colour of a light associated with a particular system, the examiner should make every effort not to name the light system during the flight, but rather to identify the significance of as many of the following lights as possible.

Taxiways – While seated in a taxiing aircraft, the applicant's attention should be drawn to relevant taxiway lighting. The applicant must be asked to describe what they can see on the taxiway lighting. There is no requirement to name colours however the applicant's description should accurately describe the layout of lighting.

Holding points – While seated in a taxiing aircraft, the applicant's attention should be drawn to relevant holding point lighting and markings. The applicant must be asked to describe what they can see on the taxiway. There is no requirement to name colours however the applicant's description should accurately describe the layout of the holding point markings and lighting.

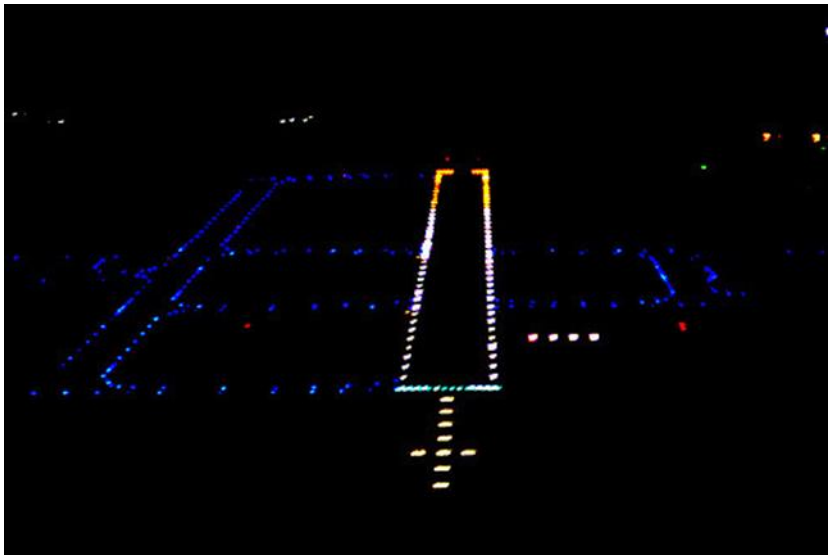
Figure 9. Holding point stop-bar lights

Runway edge - While seated in a flying and/or taxiing aircraft, the applicant's attention should be drawn to relevant runway edge lighting. The applicant must be asked to describe what they can see on the runway edge lighting and how it differs along the length of the runway. There is no requirement to name light colours, however the applicant's description should match the examiner's observation of the lighting.

Runway ends – While seated in a flying and/or taxiing aircraft, the applicant's attention should be drawn to relevant runway end lighting. The applicant must be asked to describe what they can see on the runway end lighting and how it differs from edge lighting. There is no requirement to name colours, however the applicant's description should identify the differences between end lighting and edge lighting.

In runway lights (centreline, touchdown zone, taxiway lead off lights) – While seated in a flying and/or taxiing aircraft, the applicant's attention should be drawn to relevant runway lighting. The applicant must be asked to describe what they can see on the runway lighting. There is no requirement to name colours however the applicant's description should accurately describe the layout of lighting.

Figure 10. Airport lighting at night



Other aircraft and direction of travel – While seated in a flying and/or taxiing aircraft, the applicant's attention should be drawn to other aircraft in the vicinity. The applicant should be asked to state the location and direction of travel of other aircraft, in the air and/or on the ground. There is no requirement to name the colours of lights on those aircraft, but the applicant should be able to detect the presence of the aircraft and identify its orientation and direction of travel.

Obstacles - While seated in a taxiing and/or flying aircraft, the applicant's attention should be drawn to relevant obstacle markings and/or lighting on tall buildings, towers or other obstacles. The applicant should be asked to describe what they can see. There is no requirement to name colours however the applicant's description should accurately describe the layout of the obstacle markings and lighting.

Airport beacons – While seated in a taxiing and/or flying aircraft, the applicant's attention should be drawn to an airport beacon. The applicant must be asked to describe what they can see. There is no requirement to name colours however the applicant's description should identify the presence of the beacon and accurately describe its location and behaviour.

Conduct of the AOCVA Flight Component – PAPI

Description of PAPI operational information

The aerodrome selected for the assessment must have a serviceable PAPI installed that is set for a standard 3° approach path. PAPI's set for different approach angles (e.g. YSHL) are not able to be used.

The examiner must use the provided standard briefing document to describe how the PAPI system works and what operational information it conveys. This must include the colour of the lights (red and white), the position and sequence in which they change (light closest to the runway turns red first), and the meaning of each combination of lights as it pertains to the approach path.

The examiner must use the following phrases regarding the relationship between the PAPI indications and the approach path, and explain to the applicant that they will be required to utilise these phrases when describing the PAPI during the flight test:

- Four whites ‘Very high’
- Three whites and one red ‘High’
- Two whites and two reds ‘On slope’ or ‘On profile’
- One white and three reds ‘Low’
- Four reds ‘Very low’

The examiner must also explain that the change from one indication to another is gradual, and that when change is noticed by the applicant in flight, they must use the phrase ‘It's changing’.

Identification and interpretation of PAPI signals

The Flight Component – PAPI will consist of 5 runs toward the aerodrome on the extended centreline of the selected PAPI-equipped runway. The first run shall be a familiarisation run to confirm the applicant is able to correctly identify the location of the PAPI to be used. Run 1 is not assessable. The subsequent 4 runs will be the assessment component of the test.

Run 1

While seated in a flying aircraft, the examiner should position the aircraft on a 6 NM final at 1500 ft height above aerodrome (AGL). The applicant must correctly identify the aerodrome, runway, and PAPI to be used for the test. The examiner may assist the applicant with this process.

Break off the run no later than 3 NM. If the applicant is unable to correctly identify the aerodrome, runway, and PAPI, this run may be repeated. If, after a second familiarisation run, the applicant is still unable to correctly identify the aerodrome, runway, and PAPI to be used, the test should be terminated.

Run 2

The examiner should position the aircraft on a 6 NM final at 1500 ft HAA and confirm with the applicant that they can see the PAPI. Once the examiner can clearly identify an on-slope indication on the PAPI, they must announce ‘Begin the test’.

The aircraft is to be maintained on the centreline at 1500 ft HAA. This will result in the PAPI indication changing from on slope, to high, to very high, at approximately 0.5 NM intervals.

Depending on aircraft speed, this will equate to 15 to 30 second intervals.

As the PAPI indication changes, the applicant must correctly identify this change and each indication by use of the standard phrases outlined in the pre-flight brief. The applicant must verbalise the phrase indicated within three (3) seconds of the examiner observing the change. In this scenario the sequence of phrases should be:

- ‘on slope’
- ‘it's changing, it's high’
- ‘it's changing, it's very high’

Break off the run once the ‘very high’ indication is identified by the applicant, or by 3.0 NM.

Run 3

The examiner should position the aircraft on a 6 NM final at 1200 ft HAA and confirm with the applicant that they can see the PAPI. At 5 NM, and with the examiner being able to identify 4 reds on the PAPI, they must announce 'Begin the test'.

The aircraft is to be maintained on the centreline at 1200 ft AGL. This will result in the PAPI indication changing from very low, to low, to on slope, at approximately 0.5 NM intervals.

Depending on aircraft speed, this will equate to 15 to 30 second intervals.

As the PAPI indication changes, the applicant must correctly identify this change and each indication by use of the standard phrases outlined in the pre-flight brief. The applicant must verbalise the phrase indicated within three (3) seconds of the examiner observing the change. In this scenario the sequence of phrases should be:

- 'very low'
- 'it's changing, it's low'
- 'it's changing, it's on slope'

Break off the run once the 'on slope' indication is identified by the applicant, or by 3.0 NM.

Run 4

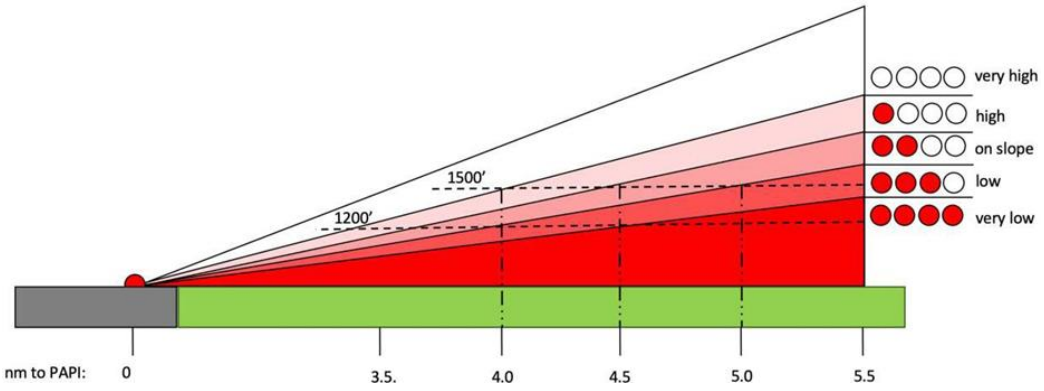
Run 4 is to be a repeat of Run 2.

Run 5

Run 5 is to be a repeat of Run 3.

Refer to Figure 11 below for a visual depiction of the 1500 and 1200 feet runs.

Figure 11. Visual depiction of the 1500 and 1200 feet runs



Note: It is recognised that geometry can be used to calculate the distance from the aerodrome where each PAPI indication change will take place. Flight deck distance to run information visible to the applicant should be disabled or obscured.

Acknowledgement of country

The Civil Aviation Safety Authority (CASA) respectfully acknowledges the Traditional Custodians of the lands on which our offices are located and the places to which we travel for work. We also acknowledge the Traditional Custodians' continuing connection to land, water and community. We pay our respects to Elders, past and present.

Artwork: James Baban.