Ground Component Prep
Commercial Pilot Licence (Aeroplane)

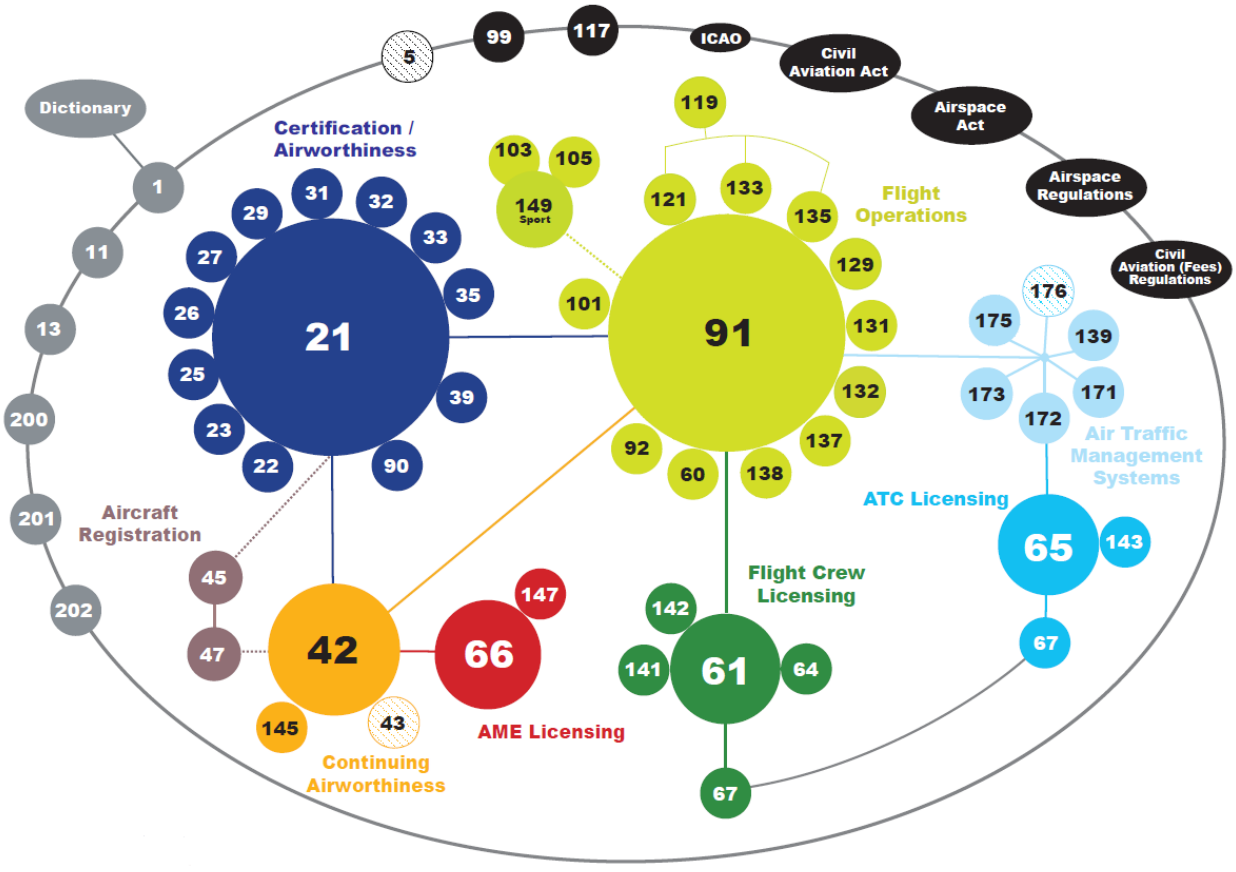
Introduction

This document was prepared by Aaron Dorsett and Luke Cashion-Lozell while studying to complete the Ground Component assessment for a Commercial Pilot License (Aeroplane). We provide this document to you to assist in and guide the studying for yours. This document is presented as is and is not guaranteed to be error free. Some parts may be specific to some aircraft in use for the flight test, you should adapt these sections to fit your aircraft. Always ensure that you cross reference any information provided with the relevant up to date parts of the regulations.

If you have any compliments or feedback you can reach out to Luke Cashion-Lozell at hello@lukeacl.com.

Relevant parts of the CASR 1998

- Part 61 - Flight Crew Licensing
- Part 91 - General Operating and Flight Rules
- Part 92 - Consignment and Carriage of Dangerous Goods
- Part 99 - Drug and Alcohol Management Plans and Testing
- Part 119 - Australian Air Transport Operations - Certification and Management
- Part 121 - Australian Air Transport Operations - Larger Aeroplanes
- Part 135 - Australia Air Transport Operations - Smaller Aeroplanes



- Part 138 - Aerial Work Operations

Privileges and limitations of the licence with category rating

Privileges

Part 61.I of the CASR states that:

- I can be the pilot in command of any aircraft in any operation other than
  - A multi-crew aircraft in an air transport operation, or
  - While I have less than 750 hours, an aircraft certificated for single-pilot operations with an MTOW exceeding 5,700kg in an air transport operation.
- I can be the co-pilot in any aircraft in any operation
- While operating in a multi-crew operation I must have completed a multi-crew cooperation course of training.

Limitations

Part 61.E of the CASR states that in order to exercise the privileges of my CPL:

- *Ratings* - I must hold the relevant category (aeroplane) and class (single-engine) rating for the aircraft I am flying, and the relevant flight activity (instrument, night VFR, low level) rating for the type of activity I am engaging in.
- *Endorsements* - I must hold any design feature endorsements (CSU, RG, floats, tail-wheel) for the aircraft I am flying.
- *Competency* - I must be competent in the aircraft I am flying, which includes operating the navigation and operating systems, conducting all normal, abnormal, and emergency procedures, applying operating limitations, meeting weight and balance requirements, and applying performance data including take-off and landing data for the aircraft I am flying. This competency extends to the flight activity I am performing which includes all systems required to meet that activity.
- *Operating Requirements* - If I am engaging in activities that require an AOC, the operator of the aircraft holds an AOC and is permitted to perform those activities.
- *Recency* - If I am carrying passengers I must meet recency requirements by having performed 3 take-offs above 500ft AGL and 3 landings within the last 90 days, in an aircraft of that category or approved simulator. I may also have within the last 90 days, successfully completed a relevant check or review, passed a flight test for a pilot licence or rating on a pilot licence that includes at least one take-off or landing, or, I am participating in my operator's training and checking system for an operation in an aircraft of the same category and the operator holds approval for that system.
- *Flight Review* - I must have completed a flight review within the last 24 months.
  - Flight reviews are valid from the date they are completed, until the end of the 24th month after which the flight review is completed, or if the pilot already holds a flight review and it expires within the next 3 months, the new flight review will end at the end of the 24th month after validity of the previous flight review expires.
- *Medical* - I must hold the appropriate medical for the operation I am engaging in.
- *Documents* - I am in possession of photo identification, a copy of my pilot license, and a copy of my current medical.
- *English Proficiency* - I hold a current English language proficiency assessment.
- *Aircraft Registration* - I am not operating an unregistered aircraft.

Requirements

- I must be at least 18 years of age.
- I must have passed the aeronautical knowledge examinations for the aircraft category.
- I must have completed flight training for the category, class, and required endorsements.

- I must have met the aeronautical experience requirements, for an integrated course this is 150 hours of aeronautical experience which includes:
  - 140 hours of flight time as a pilot of an aeroplane
  - At least 70 hours as pilot in command
  - At least 20 hours cross-country as the pilot in command
  - At least 10 hours of instrument time
  - At least 5 hours of instrument time in an aeroplane
- I must have passed the flight test set out in Part 61.

Requirements for an AOC

Part 119 of the CASR states that for an AOC (air operator's certificate) to be issued to an operator that operator must:

- Ensure they have an adequate Operations Manual in place which has been approved for use.
- Ensure they can conduct their operations safely. This can be achieved with a Safety Management System.
- Ensure key personnel spots are filled where required, with suitably experienced and qualified people, which include, for an individual, a Chief Executive Officer, and for an organisation, a Head of Flying Operations, a Head of Training and Checking, and a Safety Manager.
- Ensure arrangements are in place to manage the continued airworthiness of aircraft.

Classification of Operations

Part 91 of the CASR covers the General Operating and Flight Rules which is the top-level for all other operations including Private. Part 119 of the CASR extends this for AOC holders, which is then further extended by Part 121, and Part 135 of the CASR, for Australia Air Transport - Larger Aeroplanes and Australian Air Transport - Smaller Aeroplanes Respectively. Outside of Part 119 of the CASR, Part 138 of the CASR extends Part 91 of the CASR directly for Aerial Work Operations.

Charter and RPT have been combined under a single term, Air Transport Operations. Aerial work is an external load operation, a dispensing operation, or a task specialist operation. Air transport is passenger transport, cargo transport, and medical transport, that is conducted for hire or reward.

Cargo transport does not include carriage of the possessions of the operation or the pilot in command for the purpose of business or trade.

Passenger transport does not include a cost-sharing flight, where the flight is carrying the individual that is the registered operator of the flight and no other passengers, or where there are passengers no payment or reward is made or given.

If you do not have an AOC and are not conducting Aerial Work, Part 91 of the CASR applies. You are operating under General Operating and Flight Rules.

If you hold an AOC and are conducting Aerial Work, or are conducting Aerial Work where an AOC is not required, Part 91, and Part 138 of the CASR apply. You are operating under Aerial Work Operations.

If you are performing Air Transport Operations, in an aircraft with an MTOW less than 8,618kg and has 9 seats or less, Part 91, Part 119, and Part 135 of the CASR applies. You are operating under Australian Air Transport - Smaller Aeroplanes.

If you are performing Air Transport Operations, in an aircraft with an MTOW greater than 8,618kg or has more than 9 seats, Part 91, Part 119, and Part 121 of the CASR applies. You are operating under Australian Air Transport - Larger Aeroplanes.

Types of information contained in an operations manual

An Operations Manual covers items such as Policy and Procedures, Aircraft Operations, Flight Planning and Preparation, Training and Checking, Safety Management, Dangerous Goods Management, Fatigue Management, Drug and Alcohol Management, Safety Management System Instructions, and other information necessary to conduct operations in a safe and efficient manner.

Policy and Procedures include but are not limited to safety policies, key personnel, record keeping, documentation on the facilities and resources, etc.

Aircraft Operations include but are not limited to operational policies and procedures, performance requirements, weight and balance instructions, fuelling and oil procedures, a fuel policy, ground handling rules, emergency procedures, weather procedures, etc.

Flight Planning and Preparation includes information about routes and aerodromes used by the organisation.

Operations manuals also contain important forms including forms and documentation related to inducting new employees and it plays an important part in the addition or training of new staff members.

Significant Changes

Part 119.020 of the CASR defines a significant change as changes that have the potential to affect the operation in a significant way and are associated with proportionately higher risk factors. Significant changes need pre-approval from CASA.

Significant changes include but are not limited to changing the location of the operator's main operating bases, changing the operator's key personnel, a person authorised to carry out the responsibilities of key personnel is absent or can no longer perform those duties, changing the operator's process for making changes that relate to the safe conduct and management of the operations, changing the kinds of operations the operator is authorised to conduct, changing the areas of operations or routes, changing the types and models of aircraft including the addition of a new type or model, but not including ceasing to operate a type or model.

Flight and duty time limits

CAO 48.1 sets out various appendices for different types of operations and how flight and duty time limits should be managed for them. Common appendices are Appendix 1 - Basic Limits, Appendix 4 - Any Operations, and Appendix 5 - Aerial Work Operations and Flight Training Associated with Aerial Work.

Appendix 1 - Basic Limits, specifies that:

- For sleep/off duty, an FCM must be provided with 8 hours of sleep opportunity within 12 hours before commencing an FDP or standby at home base, and 10 hours when away from home base.
- In 1 day, may not be assigned an FDP longer than 9 hours, except when the FDP commenced before 0600 or 1400 in which case the limit is 8 hours.
- In 28 days no more than 100 hours of flight time.
- In 365 days no more than 1,000 hours of flight time.
- In any 24 hours, must have at least 12 hours off-duty.
- In any 7 days, must have at least 36 hours (2 local nights) off duty before the projected end of their FDP.

- In any 28 days, must have at least 6 days off duty.
- May only be assigned an FDP between the earlier of 0700 or first light, and 0100 the next day, local time.
- Must not conduct flight training after the first 7 hours of an FDP.
- May only be assigned an FDP that finished after 2200 if less than 3 of these late FDPs have been assigned in the last 7 days.
- At the FCMs discretion, an FDP can be extended by up to 1 hour if they consider themselves fit for the extension if unforeseen operational circumstances arise and an extension is operationally necessary to complete the duty.
- Must not extend if you will exceed the 28-day and 365-day limits.
- May extend flight training for up to 30 minutes beyond the first 7 hours if unforeseen circumstances arise, it is operationally necessary, and the FCM considers themselves fit for the extension.
- The pilot in command may use discretion in unforeseen operational circumstances to exceed limits in order to continue on the final sector to the destination.

An FCM is a Flight Crew Member and is the crew member who is the pilot assigned to carry out duties essential to the operation of an aircraft during flight time.

Flight time means the total time an aircraft first moves under its own power for the purpose of taking off until it comes to rest after landing.

FDP is Flight Duty Period and means the period where an FCM is required by an AOC holder to report for a duty period in which 1 or more flights as an FCM are undertaken and ends the later of the person completing all duties associated with the flight or the last of the flights, or 15 minutes after the end of a person's flights or last of the flights.

Applicability of drug and alcohol regulations

Part 91 of the CASR states that no person shall perform a safety-sensitive activity while under the influence of or impaired by alcohol or drugs, and that person shall not perform any safety-sensitive activity in the 8 hours following the consumption of alcohol.

Part 99 of the CASR states in more detail that the limit of blood alcohol is 0.02g in 210ml of breath.

Some over-the-counter drugs are permitted such as paracetamol, ibuprofen, and some non-drowsy and non-sedating antihistamines. Their use should not exceed 7 days without contacting a DAME, and when in doubt a DAME should be contacted to confirm the appropriateness of a drug.

Emergency equipment requirements

When over water at a distance greater than that a single engine aircraft can glide to a suitable landing area, an aircraft must be equipped with life jackets for each occupant, which must have a light and whistle, be of an inflatable type, and be approved by CASA. Life jackets must be worn below 2,000 feet at all times except during take-off and landing over water in accordance with a navigational procedure that is normal for the climb, or descent, at the aerodrome. When not worn a life jacket must be stowed in a location such that the person who is using it can access it immediately.

Life rafts must be carried when flown over water at a distance greater than 30 minutes at normal cruise speed, or 100 nautical miles whichever is least. There must be enough life rafts carried to provide a space for every person. Life rafts must be stowed in a well-marked location that provides ease of access in an emergency.

At a minimum, all aircraft other than single-engine aircraft must carry an automatic ELT or survival ELT. This does not apply if the aircraft is not flown more than 50 miles from its place of departure, or the flight is for a purpose related to the manufacture of the aircraft, preparation or delivery of an aircraft following its sale or transfer, or repositioning of an aircraft from outside Australia into Australia. When a single aircraft is flying over the water outside its glide range to an area suitable for landing it must carry an automatic or survival ELT. If an aircraft is required to carry more than one lift raft it must carry an automatic ELT and carry a survival ELT, or carry 2 survival ELTs. An aircraft may be flown with an inoperative ELT if an entry has been made in the logbook stating the reason for removal, the date, the make, model, and serial number, and a placard has been placed stating it is not installed. When removed for maintenance it must not be for more than 90 days.

Emergency survival equipment suitable for the area should be carried when flying in designated remote areas.

Fire extinguishers should be fitted to the aircraft appropriate for that aircraft and the number of passengers. There must be at least 1 in the cockpit, and when there are 7 or more seats, 1 in the passenger compartment.

Supplemental oxygen must be provided to the crew when operating in excess of 30 minutes above FL125 but less than FL140 for the entire period, or above FL140 for the entire period. Above FL250 there must be 10 minutes supply of oxygen.

Supplemental oxygen must be provided to passengers above FL150 for the entire period, or when above FL250, for at least 10 minutes following descent below FL250.

Passengers must be briefed to ensure they understand the dangers of an active aircraft apron, that they cannot smoke, where the emergency exits are and how to use them, the use of seat belts, oxygen, life jackets, and where they should stow their luggage, where to find the ELT, and how to adopt the brace position.

GNSS and its use in VFR navigation

GNSS should only be used to supplement map reading to obtain a positive fix. It should never be used as a primary means of obtaining a positive fix in VFR navigation.

Fuel planning and oil requirements for the flight

All flights must not depart unless the correct amount of fuel and oil is loaded for the flight. This must be established through correct planning and operational procedures.

Fuel planning should include taxi fuel, trip fuel, destination alternate fuel (if applicable), holding fuel (if applicable), contingency fuel (if applicable), final reserve fuel, and additional fuel (if applicable).

For Australian Air Transport Operations - Smaller Aeroplanes in a piston-powered aeroplane a final reserve of 45 minutes and contingency of 10% of trip fuel (not less than 5 minutes) is required. Part 91 of the CASR states that small piston-powered aeroplanes require a final reserve of 30 minutes, and large piston-powered aeroplanes require a final reserve of 45 minutes with a contingency of 5% of trip fuel.

Loading and unloading fuel

Fuel must be loaded and unloaded in a safe manner. Whilst loading and unloading AVGAS passengers cannot be aboard, embarking, or disembarking an aircraft. Hot refuelling cannot be performed with AVGAS. When refuelling an aircraft must be at least 5 meters from a sealed building, 6 meters from stationary aircraft, 15 meters from an exposed public area, and 15 meters from an unsealed building. The aircraft must be bonded to the fuelling equipment and a fire extinguisher should be located not less than 6 meters and not more than 15 meters from the refuelling point.

Managing passengers and cargo

Passengers must be seated in an individual seat, in the event of children (not turned 13) two can be seated side by side if they don't exceed 77kg and use a lap belt. An infant (not turned 2) can sit in the lap of an adult if they use an infant lap belt attached to the adult's belt, or are carried in an approved child restraint system. Seat belts should be worn at all times during take-off and landing, during an instrument approach, when flying lower than 1,000 feet AGL, and at all times during turbulent conditions.

If a person is sitting in a control seat the pilot must maintain effective communication with them and they must not touch the controls. If a person is sitting in an emergency exit they must be capable of operating the exit and must be briefed on this.

When a cabin attendant is not required and there are 10 seats or more an approved electronic public address system must be used so the pilot can communicate with passengers.

Passengers can be asked to wear a seatbelt by the pilot, fixed signage, or seatbelt lights.

Any cargo must be secured so that it cannot move around the cabin, preferably in a position designated for carriage of cargo. It can be carried in a seat as long as it does not exceed 77kg and can be restrained. It cannot obstruct an emergency exit or aisle.

Aircraft loading system

The pilot must be able to practically demonstrate the use of the weight and balance system for the aircraft they are flying.

Normal and non-normal operation of the propeller system fitted to the flight test aeroplane

The pilot must be able to practically demonstrate a clear understanding of the CSU and what would happen in the event of a failure of various parts.

Aircraft performance and landing calculations

The pilot must be able to practically demonstrate the use of take-off and landing charts to calculate the distance required versus the distance available.

Pilot maintenance authorisations

Sub-regulation 42ZC of the CAR 1988 specifies that a pilot may perform maintenance on Class B aircraft per Part 1 of Schedule 8 of the CAR 1988. This maintenance includes but is not limited to:

- Removal or installation of tyres as long as it doesn't involve the complete jacking of the aircraft
- Repairing of tyre tubes
- Removing or refitting a door as long as disassembly of the primary structure isn't required
- Replacement of side windows of an unpressurised aircraft
- Replacement of seats if doing so does not involve disassembly of the primary structure
- Repairs to upholstery
- Replacement of seat belts or harnesses
- Replacement or repair of signs or markings
- Replacement of bulbs, reflectors, glasses, lenses, or lights
- Replacement, cleaning or setting gaps of spark plugs
- Replacement of batteries
- Changing oil filters or air filters
- Replenishment of hydraulic fluid
- Removal or replacement of agricultural equipment
- Carrying out daily inspections

Aircraft speed limitations

- Vne - 175 KIAS
- Vno - 140 KIAS
- Va
  - 3,100 lbs - 110 KIAS
  - 2,600 lbs - 101 KIAS
  - 2,100 lbs - 91 KIAS
- Vfe
  - 10 - 140 KIAS
  - 20 - 120 KIAS
  - 30 - 100 KIAS
- Vs0 - 41 KIAS
- Vs1 - 51 KIAS
- Vx - 65 KIAS
- Vy - 80 KIAS
- Vglide - 76 KIAS
- Vr - 50 KIAS

- Normal Approach
  - Flaps - 60 - 70 KIAS
  - No Flaps - 70 - 80 KIAS
- Short-field Approach - 60 KIAS
- Cruise Climb - 85 - 95 KIAS

- Max Demonstrated Crosswind - 15 kts

- Red arc - 20 - 41 KIAS
  - Low airspeed warning.
- White arc - 41-100 KIAS
  - Full Flap Operating Range. Lower limit is maximum weight Vs0 in landing configuration. Upper limit is maximum speed permissible with flaps extended.
- Green arc - 51-140 KIAS
  - Normal Operating Range. Lower limit is maximum weight Vs1 at most forward C.G. with flaps retracted. Upper limit is maximum structural cruising speed.
- Yellow arc - 140-175 KIAS

    - Operations must be conducted with caution and only in smooth air.
- Red line - 175 KIAS
    - Maximum speed for all operations.

Aircraft systems

The pilot must be able to practically demonstrate an understanding of the aeroplanes fuel, electrical, CSU, and hydraulic systems. This should be done via illustration and discussion.

Meteorology

VMC Criteria

- CLASS C + G (AMSL)
  - Above 10000ft
    - Visibility - 8000m
    - Cloud - 1000ft vertical (above and below) / 1500m horizontal
  - Below 10000ft
    - Visibility - 5000m
    - Cloud - 1000ft vertical (above and below) / 1500m
- CLASS G
  - At or below 3000ft AMSL or 1000ft AGL
    - Visibility - 5000m
    - Cloud - Clear of cloud

CLASS D

- ALL heights
  - Visibility - 5000m
  - Cloud - 1000ft ABOVE / 500ft BELOW / 600m horizontal
- Special VFR Must request from ATC
  - All heights
    - Visibility - 1600m
    - Cloud - Clear of cloud

Alternate Minima

- *Cloud* - More than SCT below 1500ft (FEW + SCT = BKN) (SCT + SCT = BKN)
- *Visibility* - 8000m, Forecast PROB of fog, mist, dust or any phenomenon that restricts visibility
- *Wind* - Exceeds the MAX crosswind component for an aircraft (15 knots)
- *Weather* - A Thunderstorm or associated weather conditions (severe turbulence), or a forecast of at least a 30% PROB of such an event

Transition Layer

- The transition layer is situated at 10000ft (AMSL)
- QNH below transition layer is set to area QNH. Flights above the transition layer QNH is set to 1013.25 (ISA)
- NO flying is to take place between 10000ft and FL110

Services

TAF3 forecasts are issued 3-hourly, up from a typical TAF which is 6-hourly. TAF3's remove the 30 minute buffer typically imposed on limiting conditions in a TAF if the weather causing the limitation is in the first 3 hours of the TAF3 forecast.

Ambient Conditions

Three components to ambient conditions.

- Wind
- Temperature
- Pressure (QNH)

Before take-off the ambient conditions need to be checked 15 minutes or as close to departure as possible.

These ambient conditions can be checked prior to departure by

- Wind with a windsock

- Temperature by temp in an aircraft
- Pressure from using the sub-scale in the altimeter

The second set of TAF Temp and QNH numbers cannot be used for take-off planning.

Landing is planned by using a forecast prior to arriving at the aerodrome. When planning for max landing distance plan for no wind, as it has the worst conditions.

Pressure & Density Height

Pressure Height is calculated by taking the current elevation and for every hPa of pressure over 1013 adding 30 feet to the elevation.

In the ISA model, standard pressure is 1013, and temperature 15°C. For every 1000 feet of altitude gained the temperature decreases by 2°C. The difference in the calculated temperature using the standard temperature and altitude and the actual temperature at that altitude is ISA Deviation.

Density Height is calculated by taking the ISA deviation, multiplying that by 120, and adding it to the Pressure Height.

Conclusion

Good luck with your flight test! You've worked incredibly hard to get to this point. Go out there and crush it.