Civil Aviation Safety Authority
of Papua New Guinea

Advisory Circular

AC61-5

Pilot Licences and Ratings – Private Pilot Licence

Issue 2

31 October 2022

GENERAL

Civil Aviation Safety Authority Advisory Circulars (AC) contain information about standards, practices and procedures that the Director has found to be an Acceptable Means of Compliance (AMC) with the associated rule.

An AMC is not intended to be the only means of compliance with a rule, and consideration will be given to other methods of compliance that may be presented to the Director. When new standards, practices or procedures are found to be acceptable, they will be added to the appropriate Advisory Circular.

This Advisory Circular also includes Explanatory Material (EM) where it has been shown that further explanation is required. Explanatory Material must not be regarded as an acceptable means of compliance.

PURPOSE

This Advisory Circular provides methods, acceptable to the Director, for showing compliance with the Private Pilot Licence requirements of Rule Part 61 and explanatory material to assist in showing compliance.

RELATED CAR

This AC relates specifically to Civil Aviation Rule Parts 61 Subpart E

CHANGE NOTICE

This AC replaces Issue 1 dated 1 April 2015.

APPROVAL

This AC has been approved for publication by the Director of Civil Aviation

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INTRODUCTION

This advisory circular supports Part 61, Subpart E, Private Pilot Licences

SUBPART E – Private Pilot Licences

Rule 61.153 Eligibility Requirements

(a) Rules 61.153(a)(3) require an applicant for a PPL to have flight time experience acceptable to the Director. Attainment of the experience requirements detailed in Appendices I and II of this subpart advisory circular is acceptable.

(b) Rule 61.153(a)(6) requires an applicant for a PPL to have passed approved written examinations, or approved equivalents, in air law, air navigation and flight planning, meteorology, aircraft technical knowledge (A) or (H) as appropriate, human factors, and flight radiotelephony. Attainment of the written examination syllabuses given in Appendix III of this subpart advisory circular would meet these requirements.

(c) Rule 61.153(a)(7) requires an applicant for a PPL to demonstrate competency in the appropriate category of aircraft to a flight examiner. Attainment of the flight test syllabuses given in Appendix IV of this subpart advisory circular would meet these requirements.

(d) The syllabuses in the Appendices are derived from the New Zealand and ICAO Annex 1 requirements.

(e) Rule 61.153(b) allows the Director to issue a PPL to the holder of a current pilot licence issued by a foreign contracting State to the Convention on the basis of that foreign pilot licence.

(f) This issue will only be done on the basis of a full PPL or higher for the appropriate category of aircraft; and on the condition that the applicant passes a BFR with an appropriate flight instructor.

Appendix I Private Pilot Licence Experience Requirements

1.1 Aeroplane

1.1.1 Total flight experience

At least 50 hours in aeroplanes, except that this may be reduced to at least 40 hours in aeroplanes in the case of applicants who do not undertake the cross-country training, and except for allowable cross-crediting experience. These times are to include at least the minimum flight time requirements that follow:

- **Dual instruction:** 15 hours in aeroplanes.
- **Solo flight time:** 15 hours in aeroplanes.
- **Pilot cross-country navigation training:** 10 hours in aeroplanes in accordance with the syllabus in Appendix II, except that the holder of a PPL (H) is only required to complete 2 hours solo and 2 hours dual cross-country flight instruction in aeroplanes. An applicant who does not meet the cross- country requirements does not comply with Rule 61.153(a)(3)(i) and may not exercise the privileges of a private pilot on cross-country flight.
- **Dual instrument instruction:** 5 hours in aeroplanes, except that 2 hours may be instrument time in an approved synthetic flight trainer, in accordance with the syllabus that follows:
  - **Limited panel:** Straight and level flight and Rate 1 turns on to compass headings using basic instruments only, that is; airspeed indicator, altimeter, turn and slip indicator, magnetic compass and VSI to the following accuracy in still air conditions: compass turns ± 20 degrees, airspeed ± 10 knots, and altitude ± 250 feet.
  - **Full panel**
  - **Straight and level flight:** Maintaining compass headings to a required accuracy of ± 10 degrees.
  - **Normal turns:** At least 180 degrees left and right to within ± 20 degrees of a pre-selected heading with a maximum altitude variation of ± 250 feet.
  - **Climbing and descending:** To pre-selected altitudes. Level flight to be re-established at the pre-selected altitude ± not more than 250 feet.
  - **Recovery:** From the start of a power-on spiral dive and from the approach to a stall (stall onset) in a climbing turn.
  - When the syllabus of instrument flight instruction has been satisfactorily completed, the flight instructor completing such training is to endorse that fact in the applicants' logbook. The following wording, which may be in the form of a stick-on label or a rubber stamp, would be acceptable:

    I hereby certify that ..... has satisfactorily completed the syllabus of instrument flight instruction for the PPL and demonstrated competence .
    Signed .....Date.....
    Instructor Category .....Licence number .....

Advanced dual instruction: 5 hours in aeroplanes in accordance with the syllabus that follows:

- **Steep turns.**
- **Compass headings:** Turning on to and maintaining compass headings.

- **Stalling:** Power off, power on, flap down power off, flap down power on.
- **Forced landing:** Without power.
- **Minimum length fields:** Taking-off and landing.
- **Bad weather low flying:** Including precautionary landings.
- **Cross-wind:** Taking-off and landing.

Night flying: 5 hours in aeroplanes which is to include 2 hours of dual instruction and 2 hours of solo flight time. An applicant who does not meet this requirement may not exercise the privileges of a private pilot by night. Students should have 2 hours instrument flight time in aeroplanes before undertaking night flight training.

1.1.2 Cross-crediting

Where an applicant produces acceptable evidence of piloting experience in helicopters, gliders, powered gliders, or three-axis microlights, half the pilot-in-command time experienced within the immediately preceding 12 months, up to a maximum of 10 hours total, may be credited towards the total flight experience required, but not to the specific experiences.

1.2 Helicopter

1.2.1 Total flight experience

At least 50 hours total flight experience in helicopters, except for allowable cross-crediting experience. These times are to include at least the minimum flight time requirements that follow:

- **Dual instruction:** 20 hours in helicopters other than in amateur built helicopters.
- **Solo flight time:** 15 hours in helicopters of which not more than 5 hours may be in amateur built helicopters.
- **Cross-country navigation training:** 10 hours in helicopters which is to have been conducted in accordance with the syllabus set out in Appendix II, except that the holder of a PPL (A) is only required to successfully complete the PPL (H) cross-country flight test.
- **Advanced dual instruction:** 5 hours in helicopters in accordance with the syllabus that follows:
  - **Emergencies:** Including autorotative approaches with power recovery to the hover and engine failure in the hover, discussion on forced landings, fire in the air, ditching.
  - **Hovering turns:** 180 degree and 360 degree right and left.
  - **Figure S turn**
  - **Slope landing**
  - **Pattern flying:** With constant heading.
  - **Quick stops**
  - **Bad weather low flying:** Low visibility techniques.
  - **Cross-wind:** Take-off and landing.
  - **Minimum power:** Take-off and roll-on landing.
  - **Carriage of sling loads:** 5 hours of sling load training in helicopters which is to include 3

hours dual instruction and 1 hour of solo flight time. An applicant who does not meet this requirement does not comply with Rule 61.153(a)(5) and may not exercise the privileges of a PPL (H) for sling loading operations.

- **Mountainous terrain flight training:** 5 hours in helicopters which is to include 3 hours dual instruction and 1 hour solo flight time.

For night operations within 25 nm of a lighted heliport or aerodrome: 5 hours night flight time in helicopters which is to include 2 hours dual instruction and 2 hours solo; and 2 hours dual instrument flight instruction in helicopters.

For night operations beyond 25 nm of a lighted heliport or aerodrome (night cross-country): 10 hours night flight time in helicopters including 5 hours dual instruction, 2 hours solo, and 10 take-offs, translation circuits and landings solo; 5 hours dual instrument flight instruction in helicopters; and 3 hours night cross-country training which is to have been conducted in accordance with the syllabus set out in Appendix II.

Students should have at least 2 hours instrument flight time in helicopters before undertaking night flight training.

1.2.2 Cross-crediting

Where an applicant produces acceptable evidence of piloting experience in aeroplanes, gliders, powered gliders, or three-axis microlights, half the pilot-in-command time experienced within the immediately preceding 12 months, up to a maximum of 10 hours total, may be credited towards the total flight experience required, but not to the specific experiences.

Appendix II Private Pilot Licence Cross-Country Navigation Syllabuses

2.1 Stage 1 Elementary navigation exercises

Experience: At least 1 hour dual flight instruction and 1 hour solo flight time.

Instruction: Preparation of flight plan, weather evaluation, fuel requirements, fuel management, maintenance of heading, and map reading.

2.2 Stage 2 Basic navigation exercises

Experience: At least 2 hours dual flight instruction and 2 hours solo flight time.

Instruction: Dual flight instruction and solo practice in basic cross-country navigation.

Pre-flight preparation: Weather evaluation, selection of routes, cruising levels, minimum safe altitudes and check points, preparation and lodging of flight plan, fuel requirements and reserves, relevant air traffic rules and procedures including entry, transit, and exit lanes through controlled airspace, radio communication procedures, emergency and diversion procedures, and action on becoming uncertain of position.

In-flight procedures: Log keeping, map reading, maintenance of compass heading, elimination of track error, revisions of ETA, position reporting and adherence to air traffic clearances.

Dual flight instruction: To include at least one landing at a controlled or flight service aerodrome and 1 landing at a non-controlled aerodrome at least 25 nm from the point of departure.

Meteorological conditions: Navigation solo flights are not to be undertaken unless the forecasts are at least 2000 foot ceiling and 16 kilometres visibility.

2.3 Stage 3 Advanced navigation exercises

Experience: At least 2 hours dual flight instruction and 2 hours solo flight time.

Instruction: Dual flight instruction in advanced navigation including part high level, part low-level navigation, preferably with one landing en-route. At least 1 flight is to be made into controlled airspace in an aircraft equipped with two-way radio.

Pre-flight preparation: As for Stage 2.

In-flight procedures: As for Stage 2 but with emphasis on high level map reading, estimation of distances and revisions of ETA. Introduction to emergencies such as deterioration in weather with a resulting unscheduled landing and diversion back to base at low level under simulated meteorological conditions of 600 foot cloud base and flight visibility less than 5000 metres.

Solo advanced navigation: Following dual flight instruction, this should include a period at high level only (at least 6000 feet for aeroplanes and 2000 feet for helicopters) but not necessarily over the same route and preferably with an intermediate landing en route. This exercise should not be authorised until the supervising instructor is satisfied with the student's ability to undertake such a flight.

2.4 Cross-country flight test — helicopter

This test is to be carried out by a flight instructor or by a flight examiner and may be counted as dual instruction time. The candidate will be given the route to fly but will be expected to carry out all of the pre-

flight preparation. The flight test is to be of approximately 2 hours duration and will be flown at medium level. The candidate will be expected to use 1:500 000 scale topographical maps.

Pre-flight preparation: Map preparation; selection and marking of maps. Flight log preparation; preparation of a suitable log for in-flight use. Flight plan; preparation and filing of an ATC flight plan. ATC considerations; clearance requirements, use of entry, transit, and exit lanes if applicable. NOTAM, PNGAIP supplements and airspace restrictions; checked and considered. Weather; appropriate information obtained and correctly interpreted. Fuel planning; accurately calculated to cover the flight plus reserves. Aircraft loading and centre of gravity calculations; in accordance with flight manual. Performance considerations; requirements for take-off, route, and landing.

In-flight procedures: Pre-departure systems checks; aircraft systems required for flight, checked. Departure; set heading procedure, time noted. Position reporting; standard, timely. Map reading; regular fixing of position, competence in reading map. Log keeping; regular recording of position and time. Use of communications facilities; appropriate use of aircraft equipment to obtain relevant flight information; VOLMET, ATIS. Use of navaids; appropriate use without over-reliance, correctly identified. Tracking techniques; use of 1 in 60 rule, drift lines, line features, heading and time as appropriate. Flying accuracy; adherence to planned heading (± 10 degrees), IAS (± 5 knots), altitude (± 100 feet). ETA revision; at least one per leg.

Turning point procedures: ETA achievement; within ± 3 minutes. Identification of turning points; related to topography, spot heights, rivers, streams, roads, and tracks. Away landing; performance considerations, circuit, approach, landing, take-off. Radiotelephone procedures; standard.

Diversion: Decision; prompt and appropriate after being given a hypothetical weather or fuel situation. Track and distance estimation; correctly calculated from a positive fix of position. ETA revision; calculated within ten minutes of set heading on diversion. Fuel considerations; landing fuel calculated.

Airmanship considerations: Pilot judgement; whole flight considered. Confident, competent handling of the flight with appropriate decisions made based on sound information. Lookout; an effective look-out maintained for wires, other obstacles, and traffic. ATS procedures; standard. Lost procedures; oral discussion on ground. Emergencies; oral discussion on ground.

2.5 Night cross-country navigation training — helicopter

Prior to undertaking night cross-country training the applicant is to have completed the day navigation training and flight test. The minimum night cross-country navigation flight time is to be at least 2 hours dual flight instruction and 1 hour solo flight time.

This test is to be carried out by a flight examiner and may be counted as dual instruction time. The candidate will be given the route to fly but will be expected to carry out all of the pre-flight preparation. The test flight is to be of approximately one-hour duration and will be flown at medium level. The candidate will be expected to use 1:500 000 scale topographical maps. The form that the cross-country test will take is the same as that for day.

2.6 Certification

When the syllabus of cross-country navigation flight training has been satisfactorily completed, the flight instructor completing such training is to endorse that fact in the applicants' log book. The following wording, which may be in the form of a stick-on label or a rubber stamp, would be acceptable:

I hereby certify that .....

has satisfactorily completed the syllabus of cross-country navigation flight training for the PPL and demonstrated competence.

Signed.....Date.....

Instructor Category .....Licence number .....

Appendix III Private Pilot Licence written examination syllabuses

3.1 AIR

LAW

Candidates are required to have a broad knowledge of the purpose and content of the following documents or groups of documents:

- Civil Aviation Act 2000 (as amended).
- Civil Aviation Rules (CARs).
- Civil Aviation Advisory Circulars (ACs).
- Papua New Guinea Aeronautical Information Publication (PNGAIP):
- Visual Flight Guide (VFG).
- Planning Manual.
- Visual Terminal Charts.

3.1.1 CIVIL AVIATION ACT 2000

Candidates are required to have knowledge of the following section of the ACT:

✓ Sections 63 and 64 relating to the Duties of the pilot in command.

3.1.2 CIVIL AVIATION RULES (CARS)

Candidate must demonstrate knowledge of the following Rules parts. The level of knowledge for each section of the Rules is specified by the following grading:

Level	Standard
1	Candidates are to thoroughly understand the operational provisions of this essential knowledge.
2	Candidates are to have a working understanding of this knowledge.

CAR Part 1 - Definitions and abbreviations

Candidates must demonstrate a working understanding (Level 2) of the meaning of the following terms:

Accident	Aerobatic flight
Aerodrome	Aerodrome control service
Aerodrome Control Tower	Aerodrome Flight Information service
Aerodrome operational area	Aerodrome Traffic
Aerodrome traffic circuit	Aerodrome Traffic Zone

Aeronautical Information Circular	Aeronautical Information Publication (AIP)
AIP Supplement	Aeroplane
Aircraft	Aircraft Flight Manual
Aircraft radio station	Air Traffic
Air Traffic Control (ATC) service	Air Traffic Service
Airworthiness certificate	Airworthy condition
Alerting service	Altitude
Apron	ATC clearance
Aviation Medical Assessor	Clearance limit
Control area	Controlled airspace
Controlled flight	Control zone
Cost sharing flight	Cross county flight
Cruising level	Day
Designated Medical Examiner	Document
Dual flight time	Fit and proper person
Flight Examiner	Flight Information service
Flight instruction	Flight plan
Flight time	General Aviation Area
Incident	Manoeuvring area
Movement area	Night
NOTAM	Operate
Owner	Pilot-in-command
Rating	SARTIME
SIGMET information	Synthetic flight trainer
Take-off weight	Taxi
Type	Valid
VFR flight	Visibility
Visual Meteorological Conditions	

Abbreviations

Candidates must have an awareness of the abbreviations listed in CAR Part 1.

CAR PART 12 - Accidents Incidents and Statistics

Section		Level
12.1	Applicability	2
12.3	Definitions	1
12.51	Notification of an accident	1
12.53	Details of an accident	1
12.55	Notification of an incident	1
12.57	Details of an incident	1
12.59	Investigation and reporting	2
12.101	Access to aircraft involved in an accident	2
12.103	Preservation of records	1
12.151	Aircraft operating statistics	1

CAR PART 61 - Pilot Licences and Ratings

Section		Level
61.3	Reserved	2
61.5 (a)	Pilot licence	2
61.5 (d)	Aircraft type rating	2
61.13	Offences involving substances of abuse	1

CAR PART 61 - Pilot Licences and Ratings

Section		Level
61.15	Duration of licences and ratings	2
61.17	Written examinations - prerequisites and grades	2
61.19	Cheating or other unauthorised conduct	1
61.21	Flight test prerequisites	2
61.23	Flight tests - general procedures	2
61.25	Flight training and testing - general requirements	2
61.29	Pilot logbooks	1
61.35	Medical requirements	1
61.37(b)(c) (d)(g)	Recent flight experience	1
61.39	Biennial Flight Review (BFR)	1
61.43	Examination for continued fitness or proficiency	2

61.53	Aircraft type rating eligibility requirements	2
61.55 (a)	Aircraft type rating entry in pilot logbook	2
61.103	Student Pilot - general	2
61.105	Solo flight requirements - student pilots	1
61.107	Limitations for student pilots	1
61.153	Private Pilot Licence (PPL) eligibility requirements	2
61.155	PPL privileges and limitations	1
61.157	PPL currency requirements	1

CAR PART 67 - Medical Standards and Certification

Section		**Level**
67.03	Application	2
67.09	Issue of Medical Certificates	2
67.11	Currency of Medical Certificates	1

CAR PART 71 - Designation and Classification Of Airspace

Section		**Level**
71.11 (d) (e)	Controlled and Uncontrolled airspace	1
71.13	Visual reporting points	1
71.15	QNH zones	2
71.51	Control areas	1
71.53	Control zones	1
71.55	VFR transit lanes	1
71.57	General aviation areas	1
71.105	Class C airspace	1
71.107	Class D airspace	1
71.109	Class E airspace	1
71.113	Class G airspace	1

CAR Part 73 – Special Use Airspace

Section		**Level**
73.1	Applicability	1
73.51	General	1
73.53	Restricted areas	1

73.55	Military operational areas	1
73.57	Conditional areas	1
73.59	Danger areas	1
73.61	Low flying areas	1
73.63	Aerodrome traffic areas	1
73.65	Parachute drop zones	1
73.67	Temporary airspace	1

CAR PART 91 - General Operating and Flight Rules

Section		Level
91.5	Compliance with crew instructions and commands	1
91.9	Carriage and discharge of firearms	1
91.101 (a)	Aircraft airworthiness	1
91.109	Aircraft flight manual	1
91.111 (1) (2) (3)	Documents to be carried	1
91.125	Simulated instrument flight	1
91.127	Use of aerodromes	1
91.129	Restricted and danger areas	1
91.131	Low flying areas	1
91.133	Military operational areas	1
91.135	Conditional areas	1
91.137	Volcanic hazard areas	1

CAR PART 91 - General Operating and Flight Rules

Section		Level
91.139	General aviation areas	1
91.141	Aerodrome traffic zones	1
91.201	Safety of aircraft	1
91.203	Authority of pilot-in-command	1
91.207	Occupation of seats and wearing of restraints	1
91.209 (a)	Use of oxygen	1
91.211(a),(b) (1)(6)	Passenger briefing	1
91.213	Carry-on baggage	1
91.217	Preflight actions	1

91.219	Familiarity with limitations and emergency equipment	1
91.221 (a)	Flying equipment and operating information	1
91.223 (a)	Operating on and in the vicinity of an aerodrome	1
91.225	Operations at aerodromes with air traffic services	1
91.227	Operating near other aircraft	1
91.229	Right-of-way rules	1
91.235	Dropping of objects	1
91.239 (a)	Altimeter settings	1
91.241	Compliance with ATC clearances and instructions	1
91.243	ATC light signals	1
91.245	Operations in classified and designated airspace	1
91.247 (a) (c) (d)	SSR transponder equipment and codes	1
91.249 (a) (b)	Aircraft callsigns	1
91.301	VFR meteorological minima	1
91.303	Special VFR weather minima	1
91.305	Fuel requirements for flight under VFR	1
91.307	VFR flight plans	1
91.309	Position reports	1
91.311	Minimum heights for VFR	1
91.313 (a)(1), (b)	VFR cruising altitude and flight level	1
91.315	Operating in snow and ice conditions	1

CAR PART 91 - General Operating and Flight Rules

Section		Level
91.501	General requirements - instruments and equipment	1
91.505	Seating and restraints	1
91.509	Minimum instruments and equipment	1
91.511	Night VFR instruments and equipment	1
91.513	VFR communication equipment	1
91.515	Communication and navigation equipment over	1
91.525 (a)(1), (b)	Flights over water	1
91.529	Emergency locator transmitter (ELT)	1
91.537 (b)	Inoperative instruments and equipment	1
91.541 (a)	Transponder and altitude reporting equipment	1

91.617	Operation after maintenance	1
91.629	Technical log	1
91.701	Aerobatic flight	2
91.709	Glider towing	2
91.711	Towing objects other than gliders	2

CAR PART 92 – Carriage of Dangerous Goods

Section		Level
Subpart A	General	1

3.1.3 ADVISORY CIRCULARS

Candidates must have a working knowledge of the following Subparts of the current Advisory Circulars:

- AC 12-1 Mandatory Occurrence Notification and Information
- AC 61-1 Pilot Licences and Ratings
- Subpart C - Student Pilot
- Subpart D - Private Pilot
- AC 67-1 Medical Standards and Certification

3.1.4 VISUAL FLIGHT GUIDE (VFG)

Communications

Candidates must be able to:

- find required information in the telephone/fax directory;
- interpret information contained in FISCOM charts; and
- find required information in the radio communication and navigation tables.

Operations

Candidates must be able to:

- find required information contained in the Operations section with special emphasis on general VFR Operations and Special Procedures;
- determine the beginning and end of daylight by interpretation of the Daylight Zones; identify QNH zones;
- find required information associated with Search and Rescue; and

- find the required information associated with Accident Notification.

Chart Section

Candidates must be able to:

- correctly interpret, and find information in Aerodrome Legends and General Legends;
- correctly interpret Aerodrome Charts and associated Operational Data; and
- interpret Arrival/Departure procedures at applicable aerodromes.

Emergency

Candidates must be able to find required information on:

- distress;
- communication and navaid failure;
- speechless technique using unmodulated transmissions; and
- RTF distress and urgency communications.

3.1.5 PNGAIP Planning Manual

Candidates should have a working knowledge of the information contained in the various sections. Specifically, they should be aware of the Airspace details in the RAC section and VFR Operations in the OPS section.

Candidates should also be familiar with the AIP Supplement and Aeronautical Information Circulars located at the beginning of the Planning Manual.

3.2 AIR NAVIGATION AND FLIGHT PLANNING

Form of the earth: The earth as a sphere, axis and direction of rotation, geographic poles and equator, Greenwich meridian, system of latitude and longitude, parallels and meridians, position; great circle and small circle, rhumb line.

Direction on the earth: Direction by the 360 degree system, true north, the earth's magnetic field, magnetic poles, magnetic north, variation, compass deviation, conversion between true, magnetic and compass directions, conversion between relative, true and magnetic and compass bearings.

Definition and application of terms: True and magnetic track, true, magnetic and compass headings, drift, ground-speed, indicated, calibrated and true airspeed, ground position, air position, DR position, pinpoint, and fix.

Triangle of velocities: The relationship between the vector quantities heading and true airspeed, wind direction and speed, track and ground speed, drift, solution of problems.

Aeronautical charts: The practical use of the Papua New Guinea chart series, 1:500 000, Operational Navigation Chart 1:1 000 000, VTC and Aerodrome charts, chart scales and solution of scale problems, the interpretation of the principal chart symbols and methods of indicating relief, identification of position in terms of latitude and longitude, laying off and measurement of tracks, distances and bearings, chart preparation for cross-country flight.

Pilot navigation: The use of the circular slide-rule navigational computer to solve the following problems; simple arithmetic problems, triangle of velocities, time-distance-speed problems; conversion between United States gallons, imperial gallons & litres, pounds & kilograms, nautical miles, statute miles & kilometres. Fuel consumption problems, the determination of true airspeed from calibrated airspeed, map reading, methods of determining track error and correction of heading and ETA, estimation of heading to make good a reciprocal track, determination of aircraft position in terms of bearing and distance from an identified ground position.

Mental dead reckoning: Methods of revising heading in flight including the use of drift lines on the chart, the 1-in-60 rule, and the estimation of wind effect, methods of revising ETA in flight including the use of time scales, distance scales and proportional division, effects of inaccuracies in heading, speed and height, navigation in conditions of limited visibility.

Flight planning: Elementary flight planning including the preparation of a navigational and fuel plan for a cross-country flight under VFR, with due regard to weather, terrain, aeroplane performance and air traffic control requirements, provision of adequate fuel reserves.

3.3 METEOROLOGY

The atmosphere: Extent, composition, appreciation of troposphere.

Atmospheric pressure: Measurement, variation with height, surface variation with time and place, pressure gradient.

Atmospheric temperature: Measurement, variation with height, lapse rate, isothermal layer, inversion, stability and instability.

Pressure systems: Depression, trough of low pressure, anti-cyclone, ridge of high pressure, and col; characteristic weather and movement.

Fronts: Warm, cold, occluded and stationary fronts; characteristic weather and movement, dangers to flying.

Wind: Wind velocity, variation of wind velocity with height, backing and veering, local wind effects - land and sea breezes, anabatic and katabatic winds, Fohn wind, funnel effect, gusts and squalls.

Clouds: Classification, base heights, vertical extent, and associated flying conditions.

Fog: Definitions of fog, mist and haze.

Thunderstorms: Dangers of thunderstorms, warning signs.

Topographical effects: Effect of topographical features on wind and weather, turbulence, mountain waves, cloud, precipitation.

Aviation meteorological organisation: Terms and abbreviations used in meteorological forecasts and reports, distinction between forecast and report, procedure for obtaining pre-flight meteorological information, use of appropriate codes to interpret meteorological reports and forecasts.

3.4 AIRCRAFT TECHNICAL KNOWLEDGE

Properties of the air: Density, variation of atmospheric density with change of temperature, pressure, humidity and height, density altitude.

General aerodynamics: Aerofoils, chord line, relative airflow, airflow over an aerofoil, angle of attack, lift, drag, centre of pressure and its movement, forces acting on an aircraft, loading in flight manoeuvres, stalling and spinning of aeroplanes, control surfaces and trimming devices, balance of controls, effect of loading on

stability and control, effects and use of flaps on aeroplanes, relationship between attitude, power and airspeed during take-off and approach, effect of airframe ice and frost on performance.

Engines: Fuels and octane ratings, effects of lean and rich mixtures, lubrication systems, ignition systems, fuel systems, engine handling, mixture control at altitude, recognition and control of carburettor icing, engine limitations, pilot checks and inspections, factors affecting power output.

Electrics: Direct and alternating current, charging, capacity and functioning of accumulators, function of fuses, circuit breakers, solenoids, voltage regulators, inverters, ammeters, use of ground power source.

Compasses: Pilot checks, deviation, turning and acceleration errors, importance of keeping magnetic material clear of the compass.

Instruments: Principles of operation, interpretation and use of the pressure altimeter, airspeed indicator, vertical speed indicator, turn and slip indicator, artificial horizon and directional gyro indicator, dynamic and static pressure sources.

Weight and balance: Centre of gravity, limits, and the principles of loading, empty weight, useful load, gross weight, maximum gross weight, balance, weight of fuel and oil, conversion between pounds and kilograms, weight and balance problems, determination of centre of gravity without the use of a loading chart or table, completion of load sheet.

Performance: Effects of variation in altitude, aerodrome surface and slope for aeroplanes, atmospheric pressure, temperature and wind on take-off and landing distances, pressure altitude and the use of the sensitive altimeter to determine pressure altitude, selection of runway for take-off and landing.

Airmanship: General airmanship relating to the operation of aircraft.

Pilot maintenance: Abilities and restrictions in accordance with Part 43.

Plus for aeroplanes only

Propellers: Pitch, effect on engine and aircraft performance of fine and coarse pitch propellers. Determination of take-off and landing distances.

Plus for helicopters only

Assuming unsupercharged reciprocating engine, single main rotor rotating in an anti-clockwise direction when viewed from above, anti-torque tail rotor and skid type landing gear.

Aerodynamics: Hovering flight, vertical flight, forward flight, sideward flight, rearward flight, torque, anti-torque rotor, gyroscopic precession, dissymmetry of lift, blade flapping, coning, axis of rotation, Coriolis effect, translating tendency or drift, ground effect, translational lift, transverse flow effect, pendular action.

Autorotation: Rotor RPM and flares.

Controls: Collective pitch control, throttle control, collective pitch throttle co-ordination, anti-torque (rudder) pedals, heading control, cyclic pitch control, stabilisers and trimming devices, pilot checks and inspections, fault finding and analysis.

Transmission and rotor systems: Clutch, freewheeling unit, swash plate assembly, main rotor systems, tail rotor systems, pitch angle.

Flight manual: Operating limitations, operating procedures, performance information, weight and loading distribution, placard information.

Performance: High and low density altitude conditions, effect of high density altitude, gross weight, and wind on performance.

Hazards: Retreating blade stall, power settling, ground resonance, low, medium and high frequency vibrations, transition from powered flight to autorotation, altitude versus airspeed charts, anti-torque system failure while cruising or hovering, hazards of inducing low g in helicopters fitted with teetering rotor systems and the correct recovery technique required should such a situation be encountered.

Precautions and critical conditions: General precautionary rules, rotor RPM limits, extreme attitudes and over-controlling, flight technique in hot weather, effect of altitude on instrument readings, high altitude technique, tall grass operation and water operation, carburettor icing.

3.5 HUMAN FACTORS

The human factors training and examination syllabus for private pilots is to be a practical introduction to this subject. It will then be taught and examined in full at commercial pilot level. The headings that follow are taken from the professional pilot level syllabus and are to be interpreted and fleshed-out at a level relevant to the VFR operation of light aircraft in Papua New Guinea by private pilots.

- Basic physiology and the effects of flight.
- Flying and health.
- Basic aviation psychology.
- Stress management.
- Sleep and fatigue.
- Judgement.
- Social psychology and flight deck management.
- Design of flight decks, documentation and procedures.

In accordance with the concepts of the Rule/AC system, successful completion of an approved course in Human Factors would be accepted as equivalent to a written examination pass in the subject for PPL. This requirement would be met by completion of a course of Human Factors training at an organisation certificated under Civil Aviation Rule Part 141, with certification that a satisfactory standard had been achieved.

Guidelines for approval of such a course are that it should be to the PPL human factors syllabus, of at least 15 hours duration, and include internal assessment.

The Australian CAA has published a training manual on Human Factors. Australian training organisations will be expected to use that manual as a teaching and testing aid, and the Australian CAA will not therefore test that subject. In accordance with the concepts of the rules system, successful completion of this manual within a training organisation environment, certified by the holder of a Category B or A Flight Instructor rating with a CPL credit in human factors, or equivalent qualifications to instruct in human factors, would also be accepted as equivalent to a written examination pass in the subject for PPL. In meeting the certification requirement the following wording, which may be in the form of a stick-on label or a rubber stamp, would be acceptable:

I hereby certify that.....has satisfactorily completed the text .....for their Private Pilot Licence
Signed ..... Date .....

Human Factor Instructor Qualifications .....

This book is called "Air Craft Human Performance & Limitations" and has been written by Tony Wilson. It should be noted that although this book is divided into PPL and CPL sections, working through the whole book is required for the New Zealand PPL credit. This is because the consultative process determined that the New Zealand system should not subdivide the syllabus; but should have a common syllabus that was interpreted at different levels from PPL right up to ATPL.

The New Zealand text “Aviation Medicine and other Human Factors for Pilots” with assessment modules, by Dr Ross L Ewing, has also been accepted for this purpose.

3.6 FLIGHT RADIOTELEPHONY

Controls: Correct manipulation and adjustment of the controls of an aeronautical radiotelephone transceiver.

Communication: Transmission and reception of spoken messages competently and in accordance with prescribed procedures.

Practices: Knowledge of approved aeronautical radiotelephone practices and procedures.

Regulations: Knowledge of regulations which are pertinent to the duties, responsibilities and privileges of the flight radiotelephone operator rating.

General radiotelephony procedures: Language to be used, word spelling, transmission of numerals, procedure words and phrases, time system, establishment of communications, frequencies to be used, failure of communications, identification of service, radiotelephony call signs of aircraft, procedures for exchange of messages, corrections and repetitions tests, readability scale.

Distress and urgency communications: Definitions, distress and urgency signals; distress communications; action by the aircraft in distress, imposition of silence, action by all other stations, termination of distress communications, urgency communications; action by aircraft reporting an urgency condition.

Phraseology and procedures: Standard radiotelephony phraseologies and procedures for all VFR operations, take-off, approach, and landing, at both Air Traffic Controlled Aerodromes and Flight Service Aerodromes, and en route.

Where the applicant is the holder of a Flight Radiotelephone Operator (FRTO) rating then this is acceptable as a pass in the flight radiotelephony written examination.

Appendix IV Private Pilot Licence Flight Test syllabuses

4.1 General requirements

The test is to include an oral general knowledge test followed immediately by a pilot competency test. The candidate is to provide a copy of the current meteorological forecast for the period of the flight. Failure to pass in any item of the test may result in the applicant and the instructor being advised of the failure aspects and the further training believed necessary before a further flight test may be undertaken.

Intercommunication equipment of an approved type is to be provided for use during the flight test.

4.2 General knowledge test

Aircraft documents: Certificate of airworthiness, flight manual, release to service, and radio licence.

Aircraft performance and operating requirements: Application of requirements relating to private operations including application of the performance group rating system. Assessment of take-off and landing distances for aeroplanes.

Fuel: Requirements and management.

Aircraft loading: Including fuel, oil and baggage. Completion of a load sheet and calculation of centre of gravity position for aeroplanes.

Pre-flight: Aircraft inspection, pilot maintenance, and pre-flight check.

Emergency equipment: Location, use, and operation.

Weather and PNGAIP Supplements: Obtained and correctly interpreted.

4.3 Piloting technique test for aeroplanes

Engine start and warm-up: As in flight manual or check list.

Engine checks and run-up: As in flight manual or check list.

Air Traffic Service procedure: Standard as in the PNGAIP.

Taxiing and brake check: Safe, not too fast.

Pre-take-off checks: As in check list, or in Aircraft Owners and Pilots Association Manual published by the British Light Aviation Centre.

Normal take-off: Correct power, straight take-off path, correct elevator use for nose wheel or tailwheel type, unstick, nose attitude, speed control, flap raising, accurately trimmed, nominated climb speed ± 5 knots.

Crosswind take-off: Determine crosswind component, apply to aircraft, use of differential braking on tailwheel type, straight take-off path, windward aileron raised, reducing with effective speed increase, positive clean lift-off, track out, accurately trimmed, nominated climb speed ± 5 knots.

Maximum performance take-off: Brakes, maximum power, pressures and temperatures checked, straight take-off path, nominated unstick speed, initial best angle of climb speed, accurately trimmed, then best rate-of-climb speed, retrim.

Engine failure techniques: Abandoned take-off; close throttle fully, direction, brakes, subsequent action, safe. After take-off; lower nose, correct gliding speed, trim if possible, selection of area, checks if time,

mixture ICO, fuel and ignition off, door unlocked, warn passengers, Mayday if time, flap as required, master off last if electric flap involved, correct overshoot procedure, power first.

Climbing: Nominated speed ± 5 knots, accurately trimmed, temperatures and pressures checked, look-out, heading changes in long climbs to see over nose blind spot, ball central.

Straight and level flight: Nominated heading ± 5 degrees, accurately trimmed, ± 100 feet of nominated altitude, ball central.

Descent: Nominated speed ± 5 knots, accurately trimmed, ball central.

Stalls in basic and power-on configurations: Safety checks, recovery at incipient stage with minimum height loss, no yaw.

Wing drop stall: Correct use of rudder to prevent further yaw, no aileron during initial recovery phase, correct use of power.

Magnetic compass headings: To within ± 10 degrees initially, and 5 degrees with one correction, in a climb

± 5 knots, in level flight ± 100 feet.

Steep turns: Through 360 degrees left and right, lookout, bank angle minimum of 45 degrees, correct power use during entry and roll-out, correct co-ordination and balance to within one quarter of a ball deflection, ± 100 feet.

Forced landings with power: From 500 feet approximately, in low flying area or on aerodrome, cloud base and visibility nominated by flight examiner, circuit planning, engine handling, configuration, nominated speed, execution.

Forced landings without power: Field selection and height nominated by flight examiner. Initial actions, descent plan and execution, speed nominated to ± 5 knots, carburettor heat, trouble checks, simulated Mayday, power checks, warn passengers, shut-down checks, gross undershoot or overshoot is a fail, correct overshoot procedure with only two attempts allowed.

Flap usage or sideslipping: Flap usage within speed range, safe operation. Sideslipping only tested when applicable to aircraft type, straight and in turns, speed control, safe execution.

Low flying in simulated poor visibility: Preliminary checks, use of flap, not more than 45 degree banked turns ± 100 feet, nominated speed ± 5 knots, weather avoidance reversal turns -- coastal or restricted terrain or both, correct direction of turn. Good lookout. Not above 500 foot or below 200 foot height.

Rejoining and circuiting: As nominated by flight examiner, checks before rejoining and circuit checks completed, acceptable level of safety awareness.

Normal approach and landing: Circuit checks competed, approach at nominated speed ± 5 knots, correct use of flap, correct use of trim, straight landing run, safe execution overall.

Flapless landing: Approach good, nominated speed ± 5 knots.

Cross-wind landing: Correct technique, nominated speed ± 5 knots.

Operation into minimum length fields: In accordance with Performance Charts. Circuit checks completed, descent regulated with power to pre-selected touch-down point, speed, may be stabilised at approximately 300 feet AGL on final approach, or progressive reduction to nominated speed prior to touch-down point, use of trim, use of brakes, safe execution overall.

Missed approach from below 50 feet: Correct power usage, safe execution, heading ± 10 degrees, carburettor air cold, flap retraction, accurately trimmed.

Radiotelephony tuning and procedures: Standard phraseology required.

Lookout: Good lookout and airmanship.

4.4 Piloting technique test for helicopters

Pre-flight inspection: As in checklist.

Start-up, warm-up, clutch engagement: As in flight manual.

Run-up, functional checks: As in flight manual.

Lift-off to hover: Maintain correct attitude and heading, constant height, good RPM control and co-ordination, hover check - power, centre of gravity position indicated by cyclic, control response.

Hover taxiing: Steady walking pace, good height and RPM control, skids aligned with direction of movement.

Constant heading pattern: Lift-off over spot, stabilize hover then maintain a constant heading around the pattern with good safe height, speed, directional, RPM and cyclic control, stabilize hover at each corner, look-out before rearward flight.

Hover turns 180 and 360 degree: One turn each way, constant height, steady slow rate of turn, good RPM control, adequate use of cyclic to maintain position over reference point.

Normal circuit: Good lift-off, hover, correct attitude during transition to normal climb ± 10 knots, turn at nominated height, downwind at nominated height ± 100 feet, downwind checks, judgement of base turn, safe approach speed, minimum 45 knots down to approximately 200 foot height, reasonable approach angle to nominated touchdown spot, good RPM and directional control throughout, terminate at a hover then land vertically.

Cross-wind circuit: Helicopter parked crosswind, good lift-off to hover, cyclic usage, circuit with allowances for drift, approach to hover and land crosswind.

Running take-off: With maximum operating engine RPM determine power for hover, running take-off using approximately one and a half inches of mercury manifold air pressure (MAP) below this, good directional and cyclic control to unstick, attitude and speed control to unstick, attitude and speed control to 150 foot height, normal circuit to run-on landing.

Run-on landing: Touchdown not above 10 knots ground speed, MAP to be minimum required, but not above running take-off minimum, maximum operating engine RPM, soft ground contact.

Cushion creep take-off: With maximum operating engine RPM achieve a very low hover, correct use of cyclic to achieve transition without increase in power, normal circuit to hover and landing.

Zero speed landing: Touchdown on nominated spot with zero ground speed and no hover, power minimum required, approximately that for a running take-off.

Climb and descent at constant IAS, changing power: Nominated IAS ± 10 knots to 1000 foot height

± 100 feet with good RPM control, then power reduction to 13 inches of mercury MAP, adequate use of pedal, descent to 500 foot height, same limits, recover to climb to 800 feet approximately for autorotation.

Autorotation: From approximately 800 foot height, perform a straight in autorotation with power recovery to

a 3 foot hover, initial collective fully down, positive needle split (approximately 300 RPM), good speed and RPM control in descent, safe cyclic action, co-ordination of throttle, collective and anti-torque pedal.

One hundred and eighty degree autorotation: From approximately 800 foot height perform a 180 degree autorotation with power recovery to the hover, control as for straight-in case.

Low flying: At a nominated height and not below a nominated speed, maintain good RPM control whilst turning and following basic contours with use of the collective.

Quick stops: From a height nominated, perform quick stops into wind, commencing at approximately 50 knots into wind without needle split and maintaining approximately same height with good co-ordination of RPM and heading.

Mountainous terrain flying: On a knoll or spot on a ridge perform a reconnaissance, determine the wind direction and report it, then carry out a circuit with power check and safe approach to a hover or landing as applicable. In no natural horizon conditions, demonstrate flying in a valley terminating in an approach to a hover or landing as applicable at a position nominated by the flight examiner.

Slope landings and lift-offs: Demonstrate slope landings across and up slope, maximum engine operating RPM, gentle ground contact, correct handling of collective and cyclic throughout.

Confined areas: As appropriate perform a high reconnaissance of selected confined areas, consider size, shape, wind, best approaches, obstructions, termination hover height and landing spot, surface, slope and overshoots, plan circuit, make power assessment, circuit and approach to hover or landing, and departure.

Carriage of external rack loads: To be covered by an oral discussion and briefing.

Carriage of sling loads: With the helicopter at or near its MCTOW and using a sling at least 4 metres long, position the helicopter on the ground, attach the sling to the hook, demonstrate a lift-off with maximum engine operating RPM, circuit, and approach to the hover over a nominated spot with manual release, maximum engine operating RPM on finals to the hover.

Engine failure from hover: From a height of approximately 2 feet in a stable hover, throttle off to produce a positive needle spilt, maintain a constant heading, and cushion the landing with collective.

Rundown procedures: As in flight manual.

Emergencies: Hydraulic controls failure if applicable, tail rotor emergencies, uncommanded yaw, discussions on forced landings, fire in the air, ditching, and any other emergency applicable to the helicopter type being used for the test.

Airmanship: The whole flight will be considered and an assessment made of pilot judgement, decision-making and adequacy of lookout.

Air Traffic Services: Comply with ATS practices and procedures and carry out the required communications with a degree of competency appropriate to the privileges of a PPL. Provided that, where the applicant is the holder of at least a PPL(A), the flight examiner may, at their discretion, substitute an oral examination on air traffic services practices and procedures when the helicopter is not equipped with two-way radio or air traffic services are not available.