



Hang Gliding Federation of Australia
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Powered Paraglider Pilot Training Syllabus

Foot Launched

V - 20151127

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HGFA POWERED PARAGLIDING CERTIFICATE

1. Introduction

- 1.1. This HGFA Powered Paragliding Syllabus is designed to provide guidance for the training of powered paraglider pilots to, fly cross country safely. This is a course for pilots who primarily wish to fly with motor assistance, referred to in this document as Powered Paragliding (PPG). This syllabus is designed as a direct pathway to obtaining an HGFA Foot Launched PPG certificate.
- 1.2. This syllabus is made up of introductory, theoretical and practical lessons, which a student must complete under the direction of an HGFA accredited PPG instructor (CFI), culminating in practical and theoretical exams, to gain a Foot Launched PPG certificate. The pilot is then required to complete a further 20 hours over 25 days, including 10 hrs under the guidance of either a CFI or PPG Safety Officer (SO) or PPG Senior Safety Officer (SSO) and then successfully demonstrate to a CFI, specific skills to qualify for a Cross Country PPG endorsement.
- 1.3. A PPG SO or PPG SSO is pilot recommended by a club for appointment by the HGFA General Manager. The CFI appoints the PPG SO/SSO to a particular pilot, and that PPG SO/SSO retains oversight and guidance during the mentoring period.
- 1.4. The appointment of a PPG SO or SSO is intended to provide safety protocols and to provide a pathway into the social network of the established pilot fraternity.
- 1.5. During the mentoring period the pilot shall:
 - a. Only fly with the aid of a motor
 - b. Only fly under the direct supervision of an appointed PPG SO/SSO, or their training instructor or with the prior approval of the PPG SO/SSO or instructor.
- 1.6. Flight training is intended to meet theory equivalent of the HGFA Pilot Training Syllabus for free flight and therefore provide potential for conversion options for the PPG pilot if they desire to attain soaring flight certification and vice versa. The PPG course, like the free flying course, is designed on assessment of pilot competency through a series of theory and practical sessions.
- 1.7. Tandem introductory flights and dual training has been identified by the HGFA Safety and Operations Committee as a proficient way to introduce the sport to new students, as well as a tool in the teaching of flying skills. Schools are encouraged to provide dual training for their students by means of tandem hill launch flights and tandem PPG flights. Instructors providing dual training in any form need to be suitably qualified and endorsed in the method of dual flight operations.
- 1.8. Towing is a tool that is used by schools internationally in the instruction of paragliding to provide high glides during the canopy control and high glide phases where hill launch is either not accessible or not applicable to the motor course. Scope is provided in the syllabus to utilize this method provided the appropriate prerequisite towing competencies have been attained by both the instructor and the student.
- 1.9. This Syllabus is not designed as a stand-alone document. The instructor must develop an individual "Lesson Plan" for each phase of the syllabus, and plan a training program specific to their sites and training systems. The Lesson Plan enables the instructor to apply the syllabus to their specific training environment, and ensures that each theoretical and practical component of the syllabus is provided.
- 1.10. A copy of this syllabus must be given to the student pilot at the beginning of the training period.
- 1.11. Prior to commencing any training the trainee must hold a HGFA Student Pilot Certificate.

2. Acknowledgements

- 2.1. Developed by Andrew Polidano, Brett Coupland, Grant Cassar and Lee Scott. With contribution from Cedar Anderson, Graham Sutherland, the Weightshift Microlight fraternity and various RAA PPC CFI's.
- 2.2. This syllabus was written after considering the experience of instructors in Australia and reviewing the training documents of Germany, South Africa, UK, USA, Spain and Canada.

INTRODUCTORY TANDEM FLIGHT

3. Aim

- 3.1. To provide the potential pilot candidate the experience of flight for the purpose of deciding the following:
 - a. Fitness for the candidate to undertake further flight training.
 - b. For the candidate to assess:
 - 1) whether this sport is for them, and
 - 2) the instructor.

4. Objectives

- 4.1. To have the prospective student:
 - a. observe the basic operation of a paramotor and the environment in which it operates;
 - b. gain a basic understanding of the aircraft components, controls and pre-flight checking procedures; and
 - c. take part in a well controlled flight.

5. Detail

- 5.1. Lesson Type: Theory / practical.
- 5.2. Venue: HGFA approved training site.
- 5.3. Lesson Duration: Approx. 1 hour.
- 5.4. Equipment: HGFA approved training aircraft.
- 5.5. Other materials: Harnesses, helmets and suitable clothing.

6. Pre-Requisites to Training

- 6.1. HGFA Waiver completed and witnessed.
- 6.2. HGFA Membership.
- 6.3. Health declaration.

7. Briefing notes

- 7.1. This briefing may be conducted on site.
- 7.2. Risks and dangers of the sport and safety provisions.
- 7.3. Australian sport aviation and the role of HGFA: including Pilot Training, Certificates and Endorsements.
- 7.4. Acceptance of all risk and signing of waiver.
- 7.5. Health and fitness questionnaire.
- 7.6. How a wing flies explanation.
- 7.7. How a paramotor works explanation.
- 7.8. The relationship between thrust and lift.
- 7.9. Engine failure and out landing.

8. Pre-flight briefing

- 8.1. Launch and landing procedures, including harness entry and exit procedures.
- 8.2. In-flight procedures, including relaxation, horizon and visual reference datum.
- 8.3. Aircraft controls, input requirements and effects, handing over and taking over procedures.
- 8.4. Flight plan and flight limitations.
- 8.5. Pre-flight checks.

9. Training Flight

- 9.1. Takeoff and flight path stabilisation.
- 9.2. Harness entry.
- 9.3. Student relaxation.
- 9.4. Flight path control and lookout considerations.
- 9.5. Turns, flat and moderate bank, including visual references.
- 9.6. Pitch control demonstration, using throttle and brakes (if flight conditions allow).
- 9.7. Hand over of controls (if flight conditions allow – not during landing circuit).
- 9.8. Control feel and effects of control input.
- 9.9. Landing circuit and landing.
- 9.10. Post-flight procedures and debrief.
- 9.11. Provision of ongoing pilot certificate training contacts.

INTRODUCTION TO FLIGHT OPERATIONS

10. Aim

- 10.1. To consolidate the student's introduction to the sport of paramotoring.
- 10.2. To motivate potential students to undertake a complete course by instilling confidence in the HGFA training system, the equipment and training procedures.
- 10.3. To lay the foundations of a culture of excellence by establishing at the outset.
- 10.4. An attitude of respect for the air and the prevailing weather.
- 10.5. An awareness of the need to operate within any limitations imposed by personal experience and pilot skills.
- 10.6. An awareness of the need to pay attention to detail with equipment
- 10.7. An expectation that only the highest standards of safety are acceptable in all flying operations.
- 10.8. To introduce the student to the fundamentals of paragliders, glider set-up and ground handling.

11. Objectives

- 11.1. To provide the student with an awareness of the current state of development of the sport with regard to equipment design and standards, pilot training and certification and general flight potential and limitations.
- 11.2. To outline the sports regulatory and administrative relationships.
- 11.3. To provide the student pilot with complete details of the course being offered and the normal steps of progression toward a Foot Launched Paramotoring Certificate.
- 11.4. To present a realistic picture of the risks as well as the conditions and contractual arrangements under which the course is being offered.

12. Detail

- 12.1. Venue/lesson type: Classroom / Theory and video presentation.
- 12.2. Lesson duration: Approx 1 hour.
- 12.3. Equipment: HGFA Training video, lecture-discussion, other videos.
- 12.4. Other materials: HGFA and school brochures, waivers.
- 12.5. HGFA membership applications, course programs etc.
- 12.6. Introduction of Instructor and outline objectives of session.
- 12.7. Brief History of the Sport.
- 12.8. Aerodynamics, how a wing works, controlling the aircraft, current equipment design standards, stability and performance of modern gliders.
- 12.9. Safe operating and training conditions.
- 12.10. The HGFA, pilot certificate system, pilot development plan.
- 12.11. The HGFA-CASA relationship and basic regulations.
- 12.12. Height and air space restrictions.
- 12.13. VMC (Visual Metrological Conditions).
- 12.14. Pilot in command requirements.
- 12.15. HGFA training system.
- 12.16. Outline of training program.
- 12.17. The legal situation, HGFA membership, Public Liability Insurance.
- 12.18. The waiver and what it means.
- 12.19. The risks and dangers of sport aviation.
- 12.20. The HGFA Pilot Training Workbook and Flight Log requirements.
- 12.21. Motivational DVD's such as 'Risk and Reward'.
- 12.22. Questions, discussion and explanation of points raised in videos.

CANOPY APPRECIATION

13. Aim

13.1. Canopy Introduction

14. Objectives

14.1. To familiarize the student with the aircraft components and assembly as well as pre-flight checking procedures.

14.2. The student will establish a routine for harness attachment, harness entry and pre-flight harness checking.

14.3. The student and instructor will discuss in detail the reason for each of the checks.

15. Detail

15.1. Venue/lesson type: Flat terrain.

15.2. Lesson duration: ½ hour.

15.3. Equipment: Gliders, harnesses etc.

15.4. Site rules, including no smoking in designated setup or landing areas.

15.5. Awareness of wind and weather conditions.

15.6. Assembly procedure, safe parking and layout.

15.7. Explanation of the glider component parts and materials.

15.8. Harness attachment.

15.9. Pre-flight checks and drills:

- a. Canopy.
- b. Risers, lines, brakes.
- c. Carabineers, harness connectors.
- d. "Touch to check it" in a routine system.
- e. Manufacturers check list.
- f. Inclusion of harness in pre-flight.
- g. Helmet, boots and other protective clothing.
- h. Glider de-rig and pack-up.
- i. Defect/damage observation.
- j. Personal flight log book and progress report.

GROUND HANDLING (CANOPY)

16. Objectives

- 16.1. To introduce the student to ground handling techniques without a motor.
- 16.2. Students will demonstrate the ability to assess the conditions and select the suitability for the appropriate technique.
- 16.3. The student will demonstrate pitch and roll control of the glider to launching standards in a variety of conditions, without assistance.
- 16.4. Attaining these objectives is a prerequisite to Glides (Section 56), as well as Glider Motor Consolidation (Section 63).

17. Detail

- 17.1. Venue/lesson type: Introductory training site.
- 17.2. Lesson duration: 1-2 hrs.
- 17.3. Equipment: Gliders, harnesses, helmets (must be worn from the outset).

18. Skills

- 18.1. Harness checks and hang checks.
- 18.2. Assessing wind direction and strength using wind indicators, helium balloons etc.
- 18.3. Building a wall.
- 18.4. Reverse inflation: A, D's.
- 18.5. Combination technique.
- 18.6. Strong wind techniques.
- 18.7. Nil wind techniques, forward inflation.
- 18.8. Pitch control strategies, braking the surge.
- 18.9. Controlling the pitch and roll via the brakes only, both facing the glider and in transition.

19. Competency check list

- 19.1. Student performs three consecutive successful forward inflations demonstrating corrections where necessary.
- 19.2. Student performs five consecutive successful reverse inflations with appropriate transition timing, demonstrating corrections where necessary.
- 19.3. With canopy overhead student performs three running S turns on flat ground incorporating two 60° turns.

MOTOR HARNESS INTRODUCTION

20. Objectives

- 20.1. Familiarize the student with the motor and harness components and assembly.
- 20.2. Adjust harness to student.
- 20.3. Introduce harness entry and exit procedures.
- 20.4. Establish a routine for pre-flight checking.
- 20.5. The student and instructor will discuss in detail the reason for each of the checks.

21. Detail

- 21.1. Venue/lesson type: Simulator (test hang) or flat training site.
- 21.2. Lesson duration: 1 hour explanation and demonstrations.
- 21.3. Equipment: Motor harness, simulator.
- 21.4. Cage and motor assembly procedure.
- 21.5. Explanation of the motor component parts and fuel management.
- 21.6. Test hang and harness/ motor angle optimization (for comfort, and performance).
- 21.7. Simulation of launch and landings while in test hang.
- 21.8. Pre-flight checks and drills: e.g. SAFETIPIC.
 - a. Sparkplug and Decompressor.
 - b. All secure.
 - c. Fuel Tap/ Breather on and primed. Sufficient fuel for the flight.
 - d. Exhaust not cracked or loose.
 - e. Trimmers and speed bar.
 - f. Ignition off.
 - g. Propeller.
 - h. Ignition on.
 - i. Carburettor/throttle operation (returns to idle).
- 21.9. "Touch to check it" in a routine system.
- 21.10. Paramotor type specific requirements.
- 21.11. Helmet, earmuffs and other protective clothing.
- 21.12. Motor de-rig and pack-up.
- 21.13. Emergency parachute: deployment system secure if fitted.

22. Attachment system

- 22.1. High attachment.
- 22.2. Low attachment.
- 22.3. Jettison (if applicable).

23. Reference

- 23.1. Powered Paragliding Bible Chapter 11.

GROUND HANDLING (+ MOTOR)

24. Objectives

- 24.1. The student will learn how to safely start the motor.
- 24.2. Familiarize the student with the weight, torque, thrust and gyroscopic effect of the motor.

25. Detail

- 25.1. Venue/lesson type: Workshop area or flat training site.
- 25.2. Lesson duration: 1 hour.
- 25.3. Equipment: Motor harnesses, helmet with ear protection.
- 25.4. Review SAFETIPIC.
- 25.5. Propeller safety; students to display awareness of persons nearby. Helpers to hold pilots harness to avoid conflict with propeller. Pilot to call 'clear prop'.
- 25.6. Demonstrate motor starting procedures, including specific to motor type.
- 25.7. Feeling gyroscopic effects.
- 25.8. Straight and level runs with significant power application.
- 25.9. Figure of eight runs on flat ground with varying power settings.

BASIC AERODYNAMICS

26. Objectives

26.1. The student will be able to describe essential aerodynamics and how they relate to a paraglider wing.

27. Detail

27.1. Venue/lesson type: Classroom theory presentation.
27.2. Lesson duration: 1 hour.
27.3. Equipment: Lecture, discussion, simulator.
27.4. Other materials: Model of wing and white board, PPG Bible.

28. Aerodynamics

28.1. How a wing works, airfoils, camber, span, chord.
28.2. Forces of lift, drag and weight / gravity on the wing.
28.3. Wing loading, relationship between lift and air speed.
28.4. Angle of attack, relative airflow, airspeed, stall.
28.5. Entry and exit of spirals.
28.6. Dynamic stall, stall while in a banked turn.
28.7. The difference between angle of attack and attitude (deck angle). Ref, PPG Bible 223.
28.8. Centre of pressure, centre of gravity and pendula stability.
28.9. Roll, pitch and yaw.
28.10. Weight shift control and use of brakes and back risers.
28.11. The factors influencing production of lift, including, drag, angle of attack and angle of bank, wing surface area, wing profile, airspeed and wing shape.
28.12. Torque effect.
28.13. Wing size and wing loading.

METEOROLOGY

29. Objectives

- 29.1. The student will be familiar with the basics of aviation meteorology and understand the concept of micrometeorology.
- 29.2. The student will be able to explain the relationship between air movement and glider/wing behaviour and performance. The student will be familiar with resources for meteorology observations, and understand weather charts.
- 29.3. Duration: 1 hr Classroom.

30. Applied Meteorology

- 30.1. Understanding general forecasts and aviation forecasts (username aviation password bomw0007).
- 30.2. Wind strength and direction, observations and judgment.
- 30.3. Wind strength and terrain induced turbulence (rotor).
- 30.4. Other causes of turbulence.
- 30.5. General weather observations (clouds, fronts, squalls, storms, etc).
- 30.6. Pressure systems, air masses and fronts.

31. Meteorology as applied to safe operations

- 31.1. The relationships of airspeed, wind strength and ground speed.
- 31.2. Glide angles at varying airspeed and penetration.
- 31.3. Headwinds and the relationship between throttle and angle of attack and airspeed (AOA).
- 31.4. Wind strength and airflow effects on takeoff run and pitch control.
- 31.5. Wind strength effects on landing, bleed-off and flare.
- 31.6. Wind gradient considerations and dangers.
- 31.7. Local micrometeorology (sea, land and valley breezes, katabatic and anabatic).
- 31.8. Temperature: (lapse rate, stability, inversions, temperature trace, dew point).
- 31.9. Convection and thermic lift (PPG BIBLE p.75).
- 31.10. Orographic clouds, cumulonimbus and cloud suck.

EFFECTS OF CONTROLS

32. Objectives

- 32.1. The student will demonstrate flight controls.
- 32.2. The student will understand the purpose of adjusting trim, including the effect it has on height of brake handles.
- 32.3. The student will state the effects of applying and removing power, then to counteract any undesirable tendencies resulting from power changes (pitch control and torque effect).

33. Detail

- 33.1. Venue / Lesson type: Simulator, test hang, briefing room.
- 33.2. Lesson Duration: 1 hour.
- 33.3. Equipment: Paramotoring in test hang (simulator).
- 33.4. Other materials: Aircraft.

34. Stability

- 34.1. Pendula stability.
- 34.2. Pitch stability.
- 34.3. Roll stability.

35. Effective use of flight controls

- 35.1. Throttle effects on pitch, climb, speed and turns (via torque).
- 35.2. Speed bar and trimmers.
- 35.3. Weight shift.
- 35.4. Review of take-off techniques including cross and nil wind situations.
- 35.5. The effect of motor yaw immediately after launch and what to do about it.
- 35.6. Wind direction change during takeoff run.
- 35.7. Adjusting takeoff run for a change in wind condition.
- 35.8. Correcting for wing lift or tip tuck during launch.
- 35.9. Review of landing sequence.
- 35.10. Changing course and holding a new heading, visual referencing.
- 35.11. How the aircraft is turned, body position and brake inputs.
- 35.12. Via radio instruction the student in the simulator, will initiate turns via brakes and weight shift, adjust trimmers and speed bar setting, throttle and kill switch.
- 35.13. Airspeed and turn response.
- 35.14. Levelling out, allowing for lag in response.
- 35.15. Control of heading in cross wind / crabbing flight.
- 35.16. Glide adjustment and its relationship to airspeed and altitude.
- 35.17. Responsiveness of control through a range of airspeeds.

36. References

- 36.1. Powered Paragliding Bible, Aircraft manufacturer's manual.

ACTIVE PILOTING AND CRITICAL SITUATIONS

37. Objectives

- 37.1. The student will discuss the effects of control mistakes and over reactions. The student will demonstrate emergency responses required of the pilot.

38. Detail

- 38.1. Venue / Lesson type: Simulator- Test Hang, Briefing room Theory.
38.2. Lesson Duration: 1 hour.
38.3. Equipment: Test hang (simulator), DVD's, e.g. Instability 2, SIV, Risk and Reward.
38.4. Other materials: Aircraft.

38.5. Emergencies Check List

- 38.6. Wing tip collapses.
38.7. Asymmetric and full frontal collapses.
38.8. Flying in turbulence.
38.9. Wing wake and prop wash.
38.10. Dangers of flying too slow or fast, especially near ground and correction for these errors.
38.11. Maintaining heading and pitch control through bumps / turbulence.
38.12. Correcting for turbulence induced yaw and roll.
38.13. Coping with too slow or fast approach to landing.
38.14. Coping with high flare.
38.15. Cross wind landings.
38.16. Uncontrolled landings.
38.17. Reserve deployment, practice while in simulator.
38.18. Misdirected thrust in cross wind launches leading to thrust induced lockout (PPG Bible p.55).
38.19. Parachutal Stall, recognition of and appropriate correction, (PPG Bible p.50, 69, 162, 176, 286).
38.20. B line stall.

FLIGHT PLANNING AND LANDING APPROACHES

39. Objectives

- 39.1. To review all stages of the landing flight sequence.
- 39.2. The student will be able to describe a variety of landing approaches and planning factors.
- 39.3. The student will identify the effects of poor technique and mistakes, the resultant glider reactions and the responses required for correction.

40. Detail

- 40.1. Venue/lesson type: Classroom theory presentation.
- 40.2. Lesson duration: 1 hour.
- 40.3. Equipment: HGFA Training video, lecture-discussion.
- 40.4. Other materials: White board, reference books, small model wing.

41. Flight Preparation:

- 41.1. Assess type and suitability of airfield or runways. (Wind strength, Ground conditions, Climb rate of the particular craft.)
- 41.2. Route planning from maps; known objects to identify while airborne.
- 41.3. Airspace Check.
- 41.4. Air User Check.
- 41.5. Assess possible public disturbance implications of the flight plan. (Land ownership.)
- 41.6. Fuel requirements.
- 41.7. Route planning from maps; known objects to identify while airborne.
- 41.8. Landing preparation.
- 41.9. Review of the standard landing sequence for light to moderate breezes.
- 41.10. Landing sequence for nil wind.
- 41.11. Slope of ground considerations.
- 41.12. Landing considerations and sequence for moderate/gusty conditions.
- 41.13. Coping with high flare.
- 41.14. Uncontrolled landings, PLF (Parachute Landing Fall).
- 41.15. Landing approach speeds, wind gradient.
- 41.16. Adjusting flare technique for varying situations.
- 41.17. The importance of sensing airspeed during bleed off and timing for flare.
- 41.18. Pre-flight inspection of LZ (Landing Zone) and approach area.
- 41.19. The standard landing approach.
- 41.20. Focus on the touch down point.
- 41.21. Always turn toward touch down point.
- 41.22. Judging wind direction from the air.
- 41.23. Arrival height for safe LZ inspection.
- 41.24. Standard Circuits at aerodromes (downwind base leg and final).
- 41.25. Air speed through turns on approach.
- 41.26. Minimum altitude for straight and level on final.
- 41.27. The figure eight pattern and 'S' turns.
- 41.28. Need to stay upwind of LZ or major obstacles.
- 41.29. Obstacles around landing area.
- 41.30. Flying the perimeter.

- 41.31. Other gliders on approach.
- 41.32. Alternate fields, overshoot & undershot and final glide judgment.

MAINTENANCE

42. Objectives

- 42.1. The student will be able to maintain the aircraft to manufacturer's specifications.

43. Detail

- 43.1. Venue / Lesson type: Briefing room, Tie down Area / Theory lecture-discussion, practical sessions.
- 43.2. Lesson Duration: 4 - 6 hours / 2 - 3 sessions.
- 43.3. Equipment: White board, Aircraft.
- 43.4. Other materials: HGFA Operations Manual, Maintenance documents, PPG Bible Chapter 23.

44. Power Unit

- 44.1. Periodic inspection requirements.
- 44.2. Inspection criteria.
- 44.3. Aircraft log books.
- 44.4. Defect reports.
- 44.5. Repairs, modifications.
- 44.6. Locking procedures for aircraft bolts.
- 44.7. Belt tightening and belt grip.
- 44.8. Heavy landing inspections.
- 44.9. Corrosion / Wear.
- 44.10. Engine mounts.
- 44.11. Cage.
- 44.12. Propeller, prop tape.
- 44.13. Engine sound.
- 44.14. Tuning.
- 44.15. Ignition system.
- 44.16. Fuel Mix.
- 44.17. All secure.
- 44.18. Electrical.
- 44.19. Fuel filters, fuel lines.
- 44.20. Exhaust system.
- 44.21. Attachment points.

45. Paraglider

- 45.1. Sailcloth / stitching.
- 45.2. Trimmers.
- 45.3. Porosity.
- 45.4. Line stretch.

46. References

- 46.1. Manufacturer's Handbook, HGFA Operations Manual, Aircraft Log Book, Maintenance Documentation.
- 46.2. Powered Paragliding Bible Chapter 23.

HGFA - RADIO OPERATORS ENDORSEMENT

47. Objectives

- 47.1. The student will learn the use of VHF Radio and CASA requirements governing radio procedures.
- 47.2. The student will be able to explain the rules associated with radio operations.
- 47.3. The student will be taught utilizing the existing HGFA Radio Operators course and information.

48. Detail

- 48.1. Venue | Lesson type: Briefing room, In-flight.
- 48.2. Lesson Duration: Approximately 3 hours.
- 48.3. Equipment: White board, overhead projector, VHF Radio.
- 48.4. Other materials: HGFA Radio Operators Endorsement documentation.

Progressive Check list (See Radio Operators Endorsement documentation).

- 48.5. VHF Radio - what it is and how to use it.
- 48.6. Definitions: Broadcast, report, etc.
- 48.7. What to say and how to say it.
- 48.8. Radio procedures.
- 48.9. Emergency radio procedures.
- 48.10. Radio usage responsibilities.
- 48.11. Radio wave propagation and long-range communications.

49. References

- 49.1. HGFA Operations Manual.
- 49.2. Flight Radio for Pilots - Trevor Thom.
- 49.3. Flight Radio for Pilots VFR (Visual Flight Rules) operations CD.
- 49.4. Air Services Australia publications.
- 49.5. ERSA (En Route Supplement).
- 49.6. ERC's, VTC's (En Route Chart, Visual Terminal Charts).
- 49.7. Other Supplements.

NAVIGATION

50. Objectives

- 50.1. The student will be able to navigate the aircraft under visual meteorological conditions using pilot navigation methods.
- 50.2. The student will be able to read a VTC and understand Airspace restrictions.

51. Detail

- 51.1. Venue / Lesson type: Briefing room / Theory briefing.
- 51.2. Duration: Approximately: 1 hour.
- 51.3. Equipment: White board, videos.
- 51.4. Other materials: VTC chart.
GPS (optional).

52. Basic Concepts, Definitions and Charts

- 52.1. Latitude and Longitude.
- 52.2. Practical navigation – definitions.
- 52.3. Visual Terminal Chart.
- 52.4. NOTAMs
- 52.5. Calling cards.

53. Flight Planning

- 53.1. Weather considerations: wind, cloud, visibility.
- 53.2. The flight plan: fuel requirements, radio requirements, altitudes, air space.
- 53.3. Calculating distances.
- 53.4. Altimeter settings and QNH (the barometric altimeter setting which will cause the altimeter to read altitude above mean sea level).

54. Low Level Navigation

- 54.1. Turbulence: Wind, shear, mechanical, convective turbulence.
- 54.2. Lift: thermic, ridge, convergence.
- 54.3. Obstacles.
- 54.4. Emergency landing options.

55. References

- 55.1. HGFA Operations Manual.
- 55.2. Microlight Pilot's Handbook - Brian Cosgrove.
- 55.3. Associated Air Services Australia publications/charts.
- 55.4. Meteorology & Navigation - Trevor Thorn.
- 55.5. Navigation Computer Handbook.
- 55.6. Ultralight Navigation.

GLIDES

Non Motor Glides

56. Objectives

- 56.1. The student will be able to perform appropriate take off and landing techniques in light to moderate breeze, utilizing both forward and reverse launches.
- 56.2. The student will be able to perform consistent landings on their feet and show their assessment of the wind direction by consistently landing into wind, before moving to the motor consolidation unit.
- 56.3. The "glides" unit whether achieved via tow or hill launching, must be done in at least two separate days of training.

57. Detail

- 57.1. Venue/lesson type: Approved training site or tow training area.
- 57.2. Lesson duration: 2-4 hours in at least two sessions.
- 57.3. Explanation: demonstrations and student flight practice.
- 57.4. Equipment: Full flight kit including radio without paramotor.
- 57.5. Prerequisites: Ground Handling Competencies (Section 16).
 - a. Theory BAK.
 - b. Tow appreciation if applicable Practical and theory.
- 57.6. Student will perform low glides until competency is demonstrated, with a minimum of 15 successful glides that include inflation, flight, landing and deflation.

58. Check List

- 58.1. Launch phase.
- 58.2. Airfield/landowner rules.
- 58.3. Assembly procedure and pre-flight checks.
- 58.4. Harness attachment and checks.
- 58.5. The student will be introduced to hand signals commands in case of radio failure.
- 58.6. Ground handling and wind orientation.
- 58.7. Assessing conditions and pre takeoff checks.
- 58.8. Establishment, glider static attitude and orientation.
- 58.9. Smooth acceleration.
- 58.10. Control of pitch and roll throughout takeoff run.
- 58.11. Smooth transition to flight.
- 58.12. Flight phase.
- 58.13. Control of pitch, altitude and airspeed.
- 58.14. Relaxed and subtle inputs.
- 58.15. Holding a stable course.
- 58.16. Course correction.

59. Landing Phase

- 59.1. Wings level on final approach.
- 59.2. Airspeed on approach 'bleed off'.
- 59.3. Body and hand positions.
- 59.4. Flare timing.
- 59.5. Run out of remaining ground speed.

- 59.6. Adjustment of flare to prevailing wind conditions.
- 59.7. Post landing glider control.
- 59.8. Glider de-rig and pack-up.
- 59.9. Defect/damage observation.
- 59.10. Personal flight log book and progress report.

AIRSPEED CONTROL AND SHALLOW TURNS

60. Objectives

- 60.1. The student will be able to perform simple flight sequences demonstrating an ability to fly at chosen airspeeds.
- 60.2. The student will also demonstrate efficient and coordinated shallow banked turns, to be stable on new heading, and to land into wind.

61. Detail

- 61.1. Venue/lesson type: Approved training site or tandem flight.
- 61.2. Lesson duration: 2-4 hours in two sessions.
- 61.3. Explanation: demonstrations and student flight practice (or in conjunction with tandem flight).
- 61.4. Equipment: Full flight kit including radio.
- 61.5. Student will perform minimum of 5 extended glides, which must be a minimum 100'AGL.

62. Check List

- 62.1. Assembly, harness attachment and pre-flight checks.
- 62.2. Assessing conditions and pre take-off checks.
- 62.3. Smooth transition to flight.
- 62.4. Flights at variety of nominated airspeeds - trim, min sink, dependent on available safe altitude.
- 62.5. Flying faster and slower, and then returning to trim speed.
- 62.6. Big Ears.
- 62.7. Holding nominated speed and course through slight turbulence.
- 62.8. Shallow banked turns (R & L) to achieve course changes of up to 90 degrees off wind (i.e. cross wind) and return to land into wind.
- 62.9. Demonstration of stability on new headings.
- 62.10. Holding course in cross winds without drift.
- 62.11. Accuracy and consistency of bank angles.
- 62.12. Air speed control throughout turns and course changes.
- 62.13. Continued development of landing skills.
- 62.14. Adapting landing to varied conditions.
- 62.15. Flare accuracy development.
- 62.16. Accuracy within 10 meters.
- 62.17. Personal flight log book.
- 62.18. Figure 8's and standard circuit planning

GLIDER - MOTOR CONSOLIDATION

MOTOR AND WING GROUND HANDLING AND LAUNCH PREPARATION

Ground school

63. Objectives

- 63.1. The student will demonstrate the ability to:
- a. Connect all equipment including wing, motor, radio and helmet.
 - b. Pre-flight equipment.
 - c. Start engine.
 - d. Inflate wing to take off stage with motor idling, demonstrating an awareness of correct timing for power application for both forward and reverse inflations, see p. 52 PPG Bible.
 - e. Execute running turns of at least 60° with motor idling under radio direction.
 - f. Kill engine and deflate canopy.

64. Detail

- 64.1. Venue/lesson type: Approved training site.
- 64.2. Lesson duration: 2-4 hours in two sessions.
- 64.3. Explanation: demonstrations and student flight practice.
- 64.4. Equipment: Paragliding and paramotor, head set, radios.
- 64.5. Prerequisites: Canopy Appreciation (Section 13), Motor Ground Handling (Section 24).

65. Check list

- 65.1. Assembly, harness attachment and pre-flight checks e.g. SAFETIPIC.
- 65.2. Radio checks.
- 65.3. Establish routine for hooking wing to motor for both reverse and forward inflations.
- 65.4. Assessing conditions and choosing correct launch technique.
- 65.5. Establish technique for ground handling with throttle.
- 65.6. Pitch and roll control through to transition on reverse inflation.
- 65.7. Surge control and directional control on forward launch.
- 65.8. Demonstrate achieving the wing over head and stable prior to power application.
- 65.9. Starting motor unit sequence.
- 65.10. Kill switch application.
- 65.11. Wing deflation.
- 65.12. The student will complete no less than 4 complete sequences successfully.

FLIGHT SKILLS - Part One

TAKEOFF AND CLIMBING

66. Objectives

- 66.1. The student, under radio supervision will demonstrate the ability to:
- Take off using the appropriate launch techniques (reverse, forward non - powered, forward powered).
 - Climb out to circuit height then complete a circuit.
 - Land and deflate the glider.
- 66.2. Instructor will first provide a flying demonstration of the desired activity.

67. Detail

- 67.1. Venue/lesson type: Approved training site.
- 67.2. Lesson duration: 1-2 hours in two sessions.
- 67.3. Explanation demonstrations and student flight practice.
- 67.4. Equipment: Paraglider and paramotor, head set, radios, altimeter.
- 67.5. Prerequisites: Wing and Motor Ground Handling (Sections 16 and 24), Active Piloting and Critical Situations (Section 32) Flight Planning, Landing Approaches (Section 39) Airspeed Control and Shallow Turns (Section 60).

68. Progressive Check list

- 68.1. Assembly of motor unit, paraglider layout and harness attachment.
- 68.2. All pre-flight safety checks including radio checks SAFETIPIC.
- 68.3. Radio failure procedure.
- 68.4. Set altimeter to QNH.
- 68.5. Student performs circuits in both directions demonstrating the ability to deal with the torque effect of their motor.
- 68.6. Student performs a minimum four (4) successful launches and landings.

FLIGHT SKILLS – Part 2

FLIGHT & LANDING SKILLS

69. Objectives

- 69.1. The student under radio supervision will demonstrate the ability to:
- a. Take off using the appropriate launch techniques (reverse, forward non - powered, forward powered).
 - b. To demonstrate pitch and roll control and return to level flight.
 - c. Perform medium descent manoeuvres up to 4 m/s.
 - d. Practice landing approaches and landing accuracy.
 - e. Control glider through full speed range using trimmers and speed system.
 - f. Judge wind direction.

70. Detail

- 70.1. Venue/lesson type: Approved training site.
- 70.2. Lesson duration: 1-2 hours in two sessions.
- 70.3. Explanation: demonstrations and student flight practice.
- 70.4. Equipment: Paraglider and Paramotor, head set, radios, altimeter.

71. Progressive Check list

- 71.1. Effects of throttle change, dolphining using brakes and throttle separately.
- 71.2. Climbing and descending 360° turns.
- 71.3. Medium banked turns.
- 71.4. Rear riser steering and alternative options, if risers are out of reach.
- 71.5. Coordinated low bank angle wingovers, randomly transitioning to straight and level flight.
- 71.6. Big ears.
- 71.7. Trimmers and speed system.
- 71.8. Student will perform minimum 5 spot landings into wind with in a 40 meter target.

FLIGHT SKILLS – Part 3

FLIGHT AND LANDING SKILLS Cont.

72. Objectives

- 72.1. The student, under radio supervision, will demonstrate the ability to:
- Take off using the appropriate launch techniques (reverse, forward non - powered, forward powered).
 - Set up a safe landing approach and land accurately.
 - Perform rapid descent manoeuvres up to 8 m/s.
 - Deal with collapses.
- 72.2. Instructor will perform demonstration flights for required activities.

73. Detail

- 73.1. Venue/lesson type: Approved training site.
- 73.2. Lesson duration: 1-2 hours in two sessions.
- 73.3. Explanation: Demonstrations and student flight practice.
- 73.4. Equipment: Paraglider and paramotor, head set, radios, altimeter.

74. Progressive Check list

- 74.1. 3 landings within 20 meters of a target with winds of less than 5 km/h.
- 74.2. 3 landings within 20 meters of a target with winds of more than 5 km/h.
- 74.3. Coordinated high banked turns.
- 74.4. B-line stalls if applicable on glider type.
- 74.5. Asymmetric collapses.

FOOT LAUNCHED PRACTICAL SKILLS CHECKLIST:

- 75** Following is a checklist of skills, all of which need to be successfully achieved, demonstrated or understood, before a student can be awarded a Foot Launched Powered Paragliding Certificate.
- 75.1 Layout & Pack-up of paraglider a: Nil – Light winds (0-5 Knots)
b: Moderate – Strong winds (8-15 Knots)
- 75.2 Assess conditions as suitable for flight – Selection of suitable launch point relative to the conditions and launch method relative to the conditions.
- 75.3 Demonstrates a thorough understanding of rigging a speed system or trim tabs and the knowledge and ability to safely utilize them.
- 75.4 Pre-flight checks:
Paramotor, Paraglider, Harness, Lines, Speed System, Trimmers, Hand Throttle, Communications Equip., and any other equipment required.
- 75.5 Motor Ground Handling Skills:
a: Motor pre-flight checks
b: Starting procedures
c: Propeller safety
- 75.6 Take- off Skills in a: Light winds less than 5 knots
b: Moderate winds up to 15 knots
c: Forward and Reverse Launches
Both Forward & Reverse launches must be adequately demonstrated.
- 75.7 Effective use of controls during climb-out and flight:
a: Throttle
b: Speed System (if fitted)
c: Trimmers
d: Weightshift Control
- 75.8 Demonstrates straight climb out to 500 ft with control of torque induced turn.
- 75.9 Demonstrates rear riser steering.
- 76** Demonstrates climbing turns and level turns (Right & Left) through 180° and 360° with accurate roll out and stabilization on a new heading, using both flat and moderate bank angles.
- 76.1 Demonstrates the ability to deploy and recover from a Spiral Dive.
- 76.2 Airtime & Autonomy:
a: No less than 25 hours airtime and a minimum of 30 flights logged. (All flights Powered)
b: Cross country flight with instructor of no less than 10km with landing and re launching.
c: A minimum of 12 training days with a minimum of 30 powered flights (as above) and 15 unpowered flights.
- 76.3 Has completed (or holds) a HGFA VHF Radio Operators endorsement and demonstrates a thorough understanding of airspace regulations.

Theoretical Knowledge – Part A

All of the following questions are part of the theoretical examination for a Powered Paragliding Certificate. Please note: This is not the actual exam. It is a study guide, to assist you with your learning and research.

1. What are the VMC criteria below 10,000' amsl?
2. Other than during the launch and landing phase, what is the minimum height a glider may be flown over any city, town or populous area?
3. What is the minimum distance a paraglider may be flown from spectators?
4. What are the rules of the air:
 - a. When two gliders are approaching at different heights?
 - b. When joining a thermal?
 - c. When a glider overtakes another?
 - d. When two gliders approach head on along a ridge?
 - e. When two gliders approach head on in clear air?
 - f. When two gliders approach at right angles?
 - g. When entering a thermal below a sailplane?
5. What technique is used to recover from a wing tip tuck?
6. What is the recovery technique from a stall whilst in a turn?
7. How do you recover from a full stall?
8. What are the pilot responsibilities regarding right of way?
9. What are the legal requirements as to when and where a paraglider may be flown?
10. When may a person act as pilot-in-command of a paraglider?
11. What are the priorities of First Aid?
12. What are the pilot responsibilities for collision avoidance?
13. Which rule of paragliding differs from those of sailplanes?
14. What is the HGFA recommended time between parachute repacks?
15. What problems are associated with hang gliders and paragliders flying together?

Theoretical Knowledge – Part B

All of the following questions are part of the theoretical examination for a Powered Paragliding Certificate. Please note: This is not the actual exam. It is a study guide, to assist you with your learning and research.

1. How would you define the following:
 1. Camber?
 2. Cross-port venting?
 3. Angle of Attack ?
 4. Altimeter?
 5. Pendula stability?
 6. Airfoil profile?
 7. Variometer?
 8. Prop wash?
 9. Pendulum effect ?
 10. Propeller torque effect ?
 11. Reflex?
2. What is needed for engine maintenance?
3. Explain the basic function of a two and four stroke engine
4. When is a tuck most likely to occur?
5. What do you do when you have an engine out?
6. What do you do if you are about to land in trees?
7. What is the primary cause of wake turbulence and prop wash and when would you expect it to be most pronounced?
8. What is the most serious contributor to glider deterioration?
9. What must be examined to ensure a paraglider is in good condition?
10. What must be examined if the paramotor is in good condition?
11. Where could you have a damaged paraglider repaired?
12. What are the steps to untangle a paraglider and how would you check it?
13. How would you land in strong winds and how would you prevent being dragged backwards?
14. What would you do if the wind strength increases whilst you are soaring and you are being blown behind the ridge?
15. What causes a full stall?
16. What happens to the following as the angle of attack is increased:
 1. Airflow over a wing?
 2. Total drag?
 3. Total lift?

17. What should be considered before attempting a 360° turn in front of a hill?
18. What indicates a parachutal stall?
19. What function do trim tabs and speed bars have?
20. What is a wind gradient; when does it affect your flying; and how would you cope with it ?
21. What happens when the brakes are pulled down progressively in flight?
22. What causes the main wake turbulence behind gliders?
23. In which situations would you:
 1. Fly at close to maximum airspeed?
 2. Fly at an airspeed which gives you minimum sink rate?
 3. Fly at an airspeed which gives best L/D?
24. What should you do if you are unsure of clearing a power line or other obstacle to reach your preferred landing field?
25. What is the correct accident reporting procedure?
26. What is meant by the following:
 - a. The abbreviation CAO?
 - b. The altimetry term QNH?
 - c. The term "G" airspace?
 - d. The abbreviation CTA?
 - e. The abbreviation CTAF?
 - f. The abbreviation CAR?
27. Where would you find the CAO which refers to paragliding?
28. What would indicate the approach of a squall or storm?
29. What are the best ways to pick wind direction and strength whilst flying inland; and whilst flying on the coast?
30. What are the height limits and requirements for Powered Paragliders in:
 - a. Class "G" airspace?
 - b. Controlled airspace?
31. What are the VHF requirements for flying in Class "E"?
32. What factors contribute to terrain induced turbulence?
33. What is turbulence & possible causes?
34. What is the safest speed to fly in turbulence?
35. What meteorological conditions must be considered before deciding to fly?
36. What should a pilot do when entering wind shadow?
37. What are dangers of flying near or in cloud?

38. How do you recover from:

1. A parachutal stall?
2. An impending stall?
3. A stall whilst flying downwind?
4. A frontal tuck?
5. A stall whilst in a banked turn?

39. What is the danger in a wing tip tuck?

40. Under what circumstances would take off and landing wind directions differ?

41. What factors must be considered and what techniques must be adopted when:

- i. Choosing a landing site from the air?
- ii. Launching from a cleared run above a treed ridge in a strong wind?
- iii. Launching at any time?

42. What is the best approach for landing in a sloping field?

43. What is the most common cause of accidents?

44. What indicates that a glider has lost it's zero porosity?

45. Which important safety item should be carried when coastal soaring?

46. How do groundspeed and airspeed relate?

47. What are the responsibilities of a Restricted Pilot in regard to advice, supervision?

MENTORING BY A PPG SO/SSO

83. When the student has achieved the competencies, as outlined above, he/she can be issued a Powered Paraglider Certificate. However, the pilot will be directed to a PPG SO or PPG SSO, or remain under the guidance of an Instructor, for not less than an additional 10 hours airtime. This is to ensure that the pilot can be adequately introduced to the flight protocols associated with the area in which they will generally be flying.

PPG SO / SSO

84. The PPG SO or SSO is a pilot recommended by a club and appointed by the HGFA Operations Manager to assist in the guidance of PPG pilots during the training period.
85. An applicant for the appointment as a PPG SO or SSO shall hold, as a minimum, a valid HGFA Advanced PG Certificate with Motor endorsement or Powered Paragliding Certificate with a Cross Country endorsement.
- 85.1. They shall demonstrate a genuine regard for safety and an attitude of willing helpfulness.
- 85.2. They shall have been recommended by their Club for the appointment, through the submission of a completed application form to the HGFA Operations Manager.
86. A PPG SO shall:
- have a minimum of 80 hours PPG, and
 - have a minimum of 2 years PPG, and
 - have flown a minimum of 3 different PPG wings, and
 - have flown a minimum of 2 different paramotors, and
 - hold a PPG Certificate with Cross Country endorsement, and
 - hold a current St. Johns First Aid Certificate or equivalent.
87. A PPG SSO shall:
- have a minimum of 100 hours PPG, and
 - have a minimum of 3 years PPG, and
 - have flown a minimum of 5 different PPG wings, and
 - have flown a minimum of 2 different paramotors, and
 - hold a PPG Certificate with Cross Country endorsement, and
 - hold a current St. Johns First Aid Certificate or equivalent.
 - have served as a PPG SO for at least a 4 year period
88. Any deviation from these guidelines must be justified on the application form and approved by the Operations Manager.
89. The PPG SO/SSO shall not receive any payment or reward. Nor shall he/she provide any form of instruction. The PPG SO/SSO should ideally have visual and radio contact with the pilot at all times, but as a minimum will discuss the site and the weather conditions prior to the days flying, and shall engage in a debriefing with the pilot. At any time the PPG SO/SSO may refer the pilot back to the instructor for further training, if deficiencies in the pilot's knowledge or ability become apparent.

HGFA Foot Launched Powered Paragliding Certificate

90. **HGFA Certificate Identification:**
Foot Launched Powered Paragliding Certificate – FPPG
(or acronym as maybe designated by the HGFA administration)