



Hang Gliding Federation of Australia
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**Powered Paragliding
Pilot Training Syllabus**

Wheeled Operations
V - 20151127

Paragraph		Page
1	HGFA Wheelbased Powered Paragliding Certificate	3
3	Introductory Tandem Flight	4
9	Introduction to Sport and Flight Operations	5
12	Basic Aerodynamics	6
15	Canopy & Wheelbase Appreciation	7
18	Handling Canopy & Wheelbase Under Tow – (Pre Solo)	8
22	Motor & Wheelbase Introduction – (Pre Solo)	9
25	Active Piloting and Critical Situations – (Pre Solo)	10
29	Inflation, Taxiing & Deflation - Utilising Motor – (Pre Solo)	11
32	Take-off, Flight & Landing Control – (Pre Solo)	12
37	Flight Planning – (Pre Solo)	13
40	Initial Solo Flights	14
43	Flight Skills (Part 1)	15
46	Flight Skills (Part 2)	16
49	Flight Skills (Part 3)	17
52	Meteorology	18
55	VHF Radio	19
59	Navigation	20
65	Maintenance	21
69	Wheelbase Practical Skills Checklist	22
	Theoretical Knowledge Requirements – Part A	23
	Theoretical Knowledge Requirements – Part B	24
71	Mentoring by PPG SSO or PPG SO	27
78	HGFA Certificate Identification	27

HGFA WHEELBASE POWERED PARAGLIDING CERTIFICATE

1. Introduction

- 1.1. This HGFA Wheelbase Powered Paragliding (PPG) syllabus is designed to provide guidance for the training of wheelbase powered paraglider pilots to fly safely. This syllabus is designed as a direct pathway to obtaining HGFA Wheelbase PPG certification.
- 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 Wheelbased 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. 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 flights. Instructors providing dual training in any form need to be suitably qualified and endorsed in the method of dual flight operations.
- 1.7. 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.
- 1.8. 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.
- 1.9. A copy of this syllabus must be given to the student pilot at the beginning of the training period.
- 1.10. 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 contributions from Cedar Anderson, Graham Sutherland, the Weightshift Microlight fraternity and various RAA PPC CFI's.

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: Wheelbase/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. Pre-flight briefing

- 7.1. Launch and landing procedures, including harness entry and exit procedures.
- 7.2. How a wing flies, a paramotor works, and the relationship between thrust and lift.
- 7.3. In-flight procedures, including relaxation, horizon and visual reference data.
- 7.4. Aircraft controls, input requirements and effects, handing over and taking over procedures.
- 7.5. Flight plan and flight limitations.
- 7.6. Pre-flight checks.

8. Introductory Flight

- 8.1. Takeoff and flight path.
- 8.2. Student relaxation.
- 8.3. Flight path control and lookout considerations.
- 8.4. Turns, flat and moderate bank, including visual references.
- 8.5. Pitch control demonstration, using throttle and brakes (if flight conditions allow).
- 8.6. Hand over of controls (if flight conditions allow – not during landing circuit).
- 8.7. Control feel and effects of control input.
- 8.8. Landing circuit and landing.
- 8.9. Post-flight procedures and debrief.

INTRODUCTION TO SPORT AND FLIGHT OPERATIONS

9. Aim

- 9.1. To consolidate the student's introduction to the sport of paramotoring, the HGFA & CASA.
- 9.2. An attitude of respect for the air and the prevailing weather.
- 9.3. An awareness of the need to pay attention to detail with equipment
- 9.4. To introduce the student to the fundamentals of paragliders, glider set-up and ground handling.

10. Objectives

- 10.1. 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.
- 10.2. To outline the sports regulatory and administrative relationships.
- 10.3. To provide the student pilot with complete details of the course being offered and the normal steps of progression toward certification, including the mentoring program.

11. Detail

- 11.1. Venue/lesson type: Classroom / Theory and video presentation.
- 11.2. Lesson duration: Approx 1 hour.
- 11.3. Equipment: HGFA Training video, lecture-discussion, other videos.
- 11.4. Other materials: HGFA and school brochures, waivers.

- 11.5. HGFA membership applications, course programs, HGFA training systems etc.
- 11.6. Introduction of Instructor and outline objectives of session.
- 11.7. Brief History of the Sport.
- 11.8. Safe operating and training conditions.
- 11.9. The HGFA, pilot certificate system, pilot development plan.
- 11.10. The HGFA-CASA relationship and basic regulations.
- 11.11. Pilot in command requirements.
- 11.12. The legal situation, HGFA membership, Public Liability Insurance.
- 11.13. The waiver and what it means.
- 11.14. Health and fitness questionnaire.
- 11.15. The risks and dangers of sport aviation.
- 11.16. The HGFA Pilot Training Workbook and Flight Log requirements.
- 11.17. Motivational DVD's such as 'Risk and Reward'.
- 11.18. Questions, discussion and explanation of points raised in videos.

BASIC AERODYNAMICS

12. Objectives

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

13. Detail

- 13.1. Venue/lesson type: Briefing room - theory presentation.
13.2. Lesson duration: 1 hour.
13.3. Equipment: Lecture, discussion, simulator.
13.4. Other materials: Model of wing and white board, PPG Bible.

14. Aerodynamics

- 14.1. How a wing works, airfoils, camber, span, chord.
14.2. Forces of lift, drag and weight / gravity on the wing.
14.3. Wing loading, relationship between lift and air speed.
14.4. Angle of attack, relative airflow, airspeed, stall.
14.5. Entry and exit of spirals.
14.6. Dynamic stall, stall while in a banked turn.
14.7. The difference between angle of attack and attitude (deck angle).
14.8. Centre of pressure, centre of gravity and pendula stability.
14.9. Roll, pitch and yaw.
14.10. Weight shift control and use of brakes and back risers.
14.11. The factors influencing production of lift, including, drag, angle of attack and angle of bank, wing surface area, wing profile, airspeed and wing shape.
14.12. Torque effect.
14.13. Wing size and wing loading.

CANOPY & WHEELBASE APPRECIATION- (Pre Solo)

15. Aim

15.1. Canopy & Wheelbase Introduction

16. Objectives

- 16.1. To familiarize the student with the aircraft components and assembly including hang angle theory & set-up, with & without fuel.
- 16.2. The student will establish a routine for wheelbase/harness attachment and pre-flight checking. "Quick Out" & "A Assist" familiarisation.
- 16.3. The student and instructor will discuss in detail the reason for each of the checks.

17. Detail

- 17.1. Venue/lesson type: Flat terrain.
- 17.2. Lesson duration: 1½ hour.
- 17.3. Equipment: Gliders, Kiting harness, Wheelbase etc.
- 17.4. Site rules, including no smoking in designated setup or landing areas.
- 17.5. Awareness of wind and weather conditions.
- 17.6. Assembly procedure, safe parking and layout.
- 17.7. Explanation of the glider component parts and materials.
- 17.8. Wheelbase/Harness attachment.
- 17.9. Pre-flight checks and drills:
- a. Canopy.
 - b. Risers, lines, brakes.
 - c. Carabineers, Wheelbase/harness connectors.
 - d. "Touch to check it" in a routine system.
 - e. Manufacturers check list.
 - f. Instruments (Radios, Altimeters and CHT's etc.)
 - g. Helmet, boots and other protective clothing.
 - h. Glider & wheelbase de-rig and pack-up.
 - i. Defect/damage observation.
 - j. Personal flight log book and progress report.

HANDLING CANOPY & WHEELBASE, UNDER TOW & TAXI CONDITIONS – (Pre Solo)

18. Objectives

- 18.1. To introduce the student to wing & wheelbase control techniques, without motor running.
- 18.2. Students will demonstrate the ability to assess the conditions.
- 18.3. The student will demonstrate pitch and roll control of the glider to launching standards in nil or light wind conditions, without assistance.

19. Detail

- 19.1. Venue/lesson type: Introductory training site.
- 19.2. Lesson duration: 1-2 hrs.
- 19.3. Equipment: Gliders, Wheelbase/harness, helmets (must be worn from the outset).

20. Skills

- 20.1. Wheelbase checks and hang checks.
- 20.2. Assessing wind direction and strength using wind indicators, helium balloons etc.
- 20.3. Layout of canopy and lines.
- 20.4. Nil to light wind techniques.
- 20.5. Pitch control strategies, braking the surge.
- 20.6. Controlling the pitch and roll.
- 20.7. Demonstrate competence with “Quick Out” system, if fitted and “A Assists”, if fitted.

21. Competency check list

- 21.1. Student performs three successful inflations & taxi rolls for a minimum of 100 meters, with canopy overhead, demonstrating stability of both wing and wheelbase, while under tow.

MOTOR & WHEELBASE INTRODUCTION – (Pre Solo)

22. Objectives

- 22.1. Familiarize the student with the motor and wheelbase components and assembly.
- 22.2. Establish a routine for pre-flight checking.
- 22.3. The student and instructor will discuss in detail the reason for each of the checks.

23. Detail

- 23.1. Venue/lesson type: Flat training site.
- 23.2. Lesson duration: 1 hour explanation and demonstrations.
- 23.3. Equipment: Motor wheelbase.
- 23.4. Wheelbase and motor assembly procedure. (If required)
- 23.5. Explanation of the motor component parts and fuel management.
- 23.6. Pre-flight checks and drills: e.g. SAFETIPIC.
 - a. **S**parkplug and Decompressor.
 - b. **A**ll secure.
 - c. **F**uel Tap/ Breather on and primed. Sufficient fuel for the flight.
 - d. **E**xhaust not cracked or loose.
 - e. **T**rimmers and speed bar. (If fitted)
 - f. **I**gnition off.
 - g. **P**ropeller.
 - h. **I**gnition on.
 - i. **C**arburettor/throttle operation (returns to idle).
- 23.7. "Touch to check it" in a routine system.
- 23.8. Paramotor/Wheelbase type specific requirements.
- 23.9. Helmet, earmuffs and other protective clothing.
- 23.10. Motor wheelbase, de-rig and pack-up.
- 23.11. Emergency parachute: deployment system secure if fitted.

24. Attachment system

- 24.1. High attachment.
- 24.2. Low attachment.

ACTIVE PILOTING AND CRITICAL SITUATIONS – (Pre Solo)

25. Objectives

- 25.1. The student will discuss the effects of control mistakes and over reactions. The student will demonstrate emergency responses required of the pilot, under tow.

26. Detail

- 26.1. Venue / Lesson type: Briefing room, Airfield.
26.2. Lesson Duration: Briefing room 1 hour.
Airfield – Until competence is demonstrated.
26.3. Equipment: DVD's, e.g. Instability 2, SIV, Risk and Reward.
26.4. Other materials: Aircraft.

27. Emergencies Check List

- 27.1. Wing tip collapses.
27.2. Asymmetric and full frontal collapses.
27.3. Flying in turbulence.
27.4. Wing wake and prop wash.
27.5. Dangers of flying too slow or fast, especially near ground and correction for these errors.
27.6. Maintaining heading and pitch control through bumps / turbulence.
27.7. Correcting for turbulence induced yaw and roll.
27.8. Coping with too slow or fast approach to landing.
27.9. Coping with high flare.
27.10. Cross wind landings.
27.11. Uncontrolled landings.
27.12. Reserve deployment, practice while in simulator.
27.13. Misdirected thrust in cross wind launches leading to thrust induced lockout.
27.14. Parachutal Stall, recognition of and appropriate correction.
27.15. Oscillation control on take-off.

28. The student will demonstrate pitch and roll control of the glider to launching standards in nil or light wind conditions, without assistance.

INFLATION, TAXIING & DEFLATION - UTILISING MOTOR

29. Objectives

29.1. The student will be able to perform inflation, taxi and deflation techniques.

30. Detail

30.1. Venue/lesson type: Approved training site or tow training area.

30.2. Lesson duration: 2-4 hours.

30.3. Explanation: demonstrations and student flight practice.

30.4. Equipment: Paraglider, Paramotor, Wheelbase, Head set, Radios, Altimeter, etc.

30.5. Student will perform minimum of 6 successful inflations, including taxiing 50m & deflation of the wing.

31. Check List

31.1. Launch phase.

31.2. Airfield/landowner rules.

31.3. Assembly procedure and pre-flight checks.

31.4. Harness attachment and checks.

31.5. The student will be introduced to hand signals commands in case of radio failure.

31.6. Ground handling and wind orientation.

31.7. Assessing conditions and pre takeoff checks.

31.8. Establishment, glider static attitude and orientation.

31.9. Smooth acceleration.

31.10. Control of pitch and roll throughout taxi run.

31.11. Deflation glider control.

31.12. Glider de-rig and pack-up.

31.13. Defect/damage observation.

31.14. Personal flight log book and progress report.

TAKE-OFF, FLIGHT & LANDING CONTROL (Pre Solo)

32. Objectives

- 32.1. Theory of take-off, flight & landing control.

33. Detail

- 33.1. Venue / Lesson type: Briefing room.
33.2. Lesson Duration: 1 hour.

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 (If fitted) and trimmers.
35.3. Review of take-off techniques.
35.4. The effect of motor yaw immediately after launch and what to do about it.
35.5. Wind direction change during takeoff run.
35.6. Adjusting takeoff run for a change in wind condition.
35.7. Correcting for wing lift or tip tuck during launch.
35.8. Review of landing sequence.
35.9. Changing course and holding a new heading, visual referencing.
35.10. Airspeed and turn response.
35.11. Levelling out, allowing for lag in response.
35.12. Control of heading in cross wind / crabbing flight.
35.13. Glide adjustment and its relationship to airspeed and altitude.
35.14. Responsiveness of control through a range of airspeeds.

36. References

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

FLIGHT PLANNING – (Pre Solo)

37. Objectives

- 37.1. To review all stages of the flight planning.
- 37.2. The student will be able take into consideration a variety of take-off, flight & landing plans.

38. Detail

- 38.1. Venue/lesson type: Briefing room.
- 38.2. Lesson duration: 1 hour.
- 38.3. Equipment: White board, reference books, small model wing.

39. Flight Preparation:

- 39.1. Assess type and suitability of airfield or runways. (Wind strength, Ground conditions, Climb rate & wheel size of the particular craft)
- 39.2. Route planning from maps; known objects to identify while airborne.
- 39.3. Airspace Check.
- 39.4. Air User Check.
- 39.5. Assess possible public disturbance implications of the flight plan.
- 39.6. Fuel requirements.
- 39.7. The standard landing approach. Standard circuits at aerodromes.
- 39.8. Review of the standard landing sequence for light to moderate conditions.
- 39.9. Slope of ground considerations.
- 39.10. Landing considerations and sequence for moderate/gusty conditions.
- 39.11. Coping with high flare. Adjusting flare technique for varying situations.
- 39.12. Landing approach speeds, wind gradient.
- 39.13. The importance of sensing airspeed during bleed off and timing for flare.
- 39.14. Judging wind direction from the air.
- 39.15. Arrival height for safe LZ inspection.
- 39.16. Air speed through turns on approach.
- 39.17. Minimum altitude for straight and level on final.
- 39.18. The figure eight pattern and 'S' turns.
- 39.19. Need to stay upwind of LZ or major obstacles.
- 39.20. Obstacles around landing area.
- 39.21. Flying the perimeter.
- 39.22. Other aircraft on approach.
- 39.23. Alternate fields, overshoot & undershot and final glide judgment.
- 39.24. Setting Altimeters to QNH. Setting of GPS if required.
- 39.25. Setting up in flight communication systems

INITIAL SOLO FLIGHTS

40. Objectives

- 40.1. The student will demonstrate the ability to Pre-flight check all equipment
- 40.2. The student will be able to perform simple flight sequences demonstrating an ability to fly at chosen airspeeds, under radio instruction.
- 40.3. The student will also demonstrate efficient and coordinated shallow banked turns, to be stable on new heading, and to land into wind, under radio instruction.

41. Detail

- 41.1. Venue/lesson type: Approved training site.
- 41.2. Lesson duration: 2-4 hours in two sessions.
- 41.3. Explanation: Demonstrations and student flight practice.
- 41.4. Equipment: Paraglider, Paramotor, Wheelbase, Head set, Radios, Altimeter, etc.
- 41.5. Prerequisites: Has completed all Pre-Solo sections above.

42. Check list

- 42.1. Assembly, Wheelbase/harness attachment and pre-flight checks e.g. SAFETIPIC.
- 42.2. Radio checks.
- 42.3. Assessing conditions as suitable for flight.
- 42.4. Smooth transition to flight.
- 42.5. Flights at variety of nominated airspeeds - trim, min sink, dependent on available safe altitude.
- 42.6. Flying faster and slower, and then returning to trim speed.
- 42.7. 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.
- 42.8. Demonstration of stability on new headings.
- 42.9. Holding course in cross winds without drift.
- 42.10. Accuracy and consistency of bank angles.
- 42.11. Air speed control throughout turns and course changes.
- 42.12. Continued development of landing skills.
- 42.13. Adapting landing to varied conditions.
- 42.14. Flare accuracy development.
- 42.15. Accuracy within 10 meters.
- 42.16. Personal flight log book.

FLIGHT SKILLS - Part One

TAKEOFF AND CLIMBING**43. Objectives**

The student, under radio supervision will demonstrate the ability to:

- a. Take off .
- b. Climb out to circuit height then complete a circuit.
- c. Land and deflate the glider.

44. Detail

- | | | |
|-------|--------------------|--|
| 44.1. | Venue/lesson type: | Approved training site. |
| 44.2. | Lesson duration: | 1-2 hours in two sessions. |
| 44.3. | Explanation | demonstrations and student flight practice. |
| 44.4. | Equipment: | Paraglider, Paramotor, Wheelbase, Head set, Radios, Altimeter. |
| 44.5. | Prerequisites: | Has completed all Pre-Solo and Initial Solo sections above. |

45. Progressive Check list

- 45.1. Assembly of motor unit and wheelbase, paraglider layout and attachment.
- 45.2. All pre-flight safety checks including radio checks SAFETIPIC.
- 45.3. Radio failure procedure.
- 45.4. Set altimeter to QNH.
- 45.5. Students operating with a wheelbase must perform a minimum 3 launches and landings. One of the landings to be a simulated emergency downwind landing.

FLIGHT SKILLS – Part 2

FLIGHT & LANDING SKILLS**46. Objectives**

- 46.1. The student under radio supervision will demonstrate the ability to:
- Take off.
 - To demonstrate pitch and roll control and return to level flight.
 - Practice landing approaches and landing accuracy.
 - Control glider through full speed range using trimmers and speed system.
 - Judge wind direction.

47. Detail

- 47.1. Venue/lesson type: Approved training site.
- 47.2. Lesson duration: 1-2 hours in two sessions.
- 47.3. Explanation: demonstrations and student flight practice.
- 47.4. Equipment: Paraglider, Paramotor, Wheelbase, Head set, Radios, Altimeter.

48. Progressive Check list

- 48.1. Effects of throttle change and the ability to control porpoising.
- 48.2. Climbing and descending 360° turns.
- 48.3. Medium banked turns.
- 48.4. Rear riser steering and alternative options, if risers are out of reach.
- 48.5. Coordinated low & high bank angle turns, transitioning to straight and level flight.
- 48.6. Big ears.
- 48.7. Trimmers and speed system. (If fitted)
- 48.8. Student will perform minimum 5 landings into wind, within 40 meters of a target.

FLIGHT SKILLS – Part 3

FLIGHT AND LANDING SKILLS Cont.**49. Objectives**

- 49.1. The student, under radio supervision, will demonstrate the ability to:
- a. Take off
 - b. Set up a safe landing approach and land accurately.
 - c. Radio Procedures.
 - d. Engine failure & forced landings

50. Detail

- 50.1. Venue/lesson type: Approved training site.
- 50.2. Lesson duration: 1-2 hours in two sessions.
- 50.3. Explanation: Demonstrations and student flight practice.
- 50.4. Equipment: Paraglider, Paramotor, Wheelbase, Head set, Radios, Altimeter.

51. Progressive Check list

- 51.1. 3 landings within 20 meters of a target, in nil wind.
- 51.2. 3 landings within 20 meters of a target, in light to moderate winds.
- 51.3. Coordinated circuit approaches.
- 51.4. Radio calls

METEOROLOGY

52. Objectives

- 52.1. The student will be familiar with the basics of aviation meteorology and understand the concept of micrometeorology.
- 52.2. 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.
- 52.3. Duration: 1 hr Classroom.

53. Applied Meteorology

- 53.1. Understanding general forecasts and aviation forecasts (username aviation password bomw0007).
- 53.2. Wind strength and direction, observations and judgment.
- 53.3. Wind strength and terrain induced turbulence (rotor).
- 53.4. Other causes of turbulence.
- 53.5. General weather observations (clouds, fronts, squalls, storms, etc).
- 53.6. Pressure systems, air masses and fronts.

54. Meteorology as applied to safe operations

- 54.1. The relationships of airspeed, wind strength and ground speed.
- 54.2. Glide angles at varying airspeed and penetration.
- 54.3. Headwinds and the relationship between throttle and angle of attack and airspeed (AOA).
- 54.4. Wind strength and airflow effects on takeoff run and pitch control.
- 54.5. Wind strength effects on landing, bleed-off and flare.
- 54.6. Wind gradient considerations and dangers.
- 54.7. Local micrometeorology (sea, land and valley breezes, katabatic and anabatic).
- 54.8. Temperature: (lapse rate, stability, inversions, temperature trace, dew point).
- 54.9. Convection and thermic lift (PPG BIBLE p.75).
- 54.10. Orographic clouds, cumulonimbus and cloud suck.

HGFA - RADIO OPERATORS ENDORSEMENT

55. Objectives

- 55.1. The student will learn the use of VHF Radio and CASA requirements governing radio procedures.
- 55.2. The student will be able to explain the rules associated with radio operations.

56. Detail

- 56.1. Venue | Lesson type: Briefing room, In-flight.
- 56.2. Lesson Duration: Approximately 3 hours.
- 56.3. Equipment: White board, overhead projector, VHF Radio.
- 56.4. Materials: HGFA Radio Operators Endorsement documentation.

57. Progressive Check list (See Radio Operators Endorsement documentation)

- 57.1. VHF Radio - what it is and how to use it.
- 57.2. Definitions: Broadcast, report, etc.
- 57.3. What to say and how to say it.
- 57.4. Radio procedures.
- 57.5. Emergency radio procedures.
- 57.6. Radio usage responsibilities.
- 57.7. Radio wave propagation and long-range communications.

58. References

- 58.1. HGFA Operations Manual.
- 58.2. Flight Radio for Pilots - Trevor Thom.
- 58.3. Flight Radio for Pilots VFR (Visual Flight Rules) operations CD.
- 58.4. Air Services Australia publications.
- 58.5. ERSA (En Route Supplement).
- 58.6. ERC's, VTC's (En Route Chart, Visual Terminal Charts).
- 58.7. Other Supplements.

NAVIGATION

59. Objectives

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

60. Detail

- 60.1. Venue / Lesson type: Briefing room / Theory briefing.
- 60.2. Duration: Approximately: 1 hour.
- 60.3. Equipment: White board, videos.
- 60.4. Other materials: VTC &/or VNC chart.
GPS (optional).

61. Basic Concepts, Definitions and Charts

- 61.1. Latitude and Longitude.
- 61.2. Practical navigation – definitions.
- 61.3. Visual Terminal Chart.
- 61.4. NOTAMs
- 61.5. Calling cards.

62. Flight Planning

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

63. Low Level Navigation

- 63.1. Turbulence: Wind, shear, mechanical, convective turbulence.
- 63.2. Lift: thermic, ridge, convergence.
- 63.3. Obstacles.
- 63.4. Emergency landing options.

64. References

- 64.1. HGFA Operations Manual.
- 64.2. Microlight Pilot's Handbook - Brian Cosgrove.
- 64.3. Associated Air Services Australia publications/charts.
- 64.4. Meteorology & Navigation - Trevor Thorn.
- 64.5. Navigation Computer Handbook.
- 64.6. Ultralight Navigation.

MAINTENANCE

65. Objectives

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

66. Detail

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

67. Power Unit

- 67.1. Periodic inspection requirements.
67.2. Inspection criteria.
67.3. Aircraft log books.
67.4. Defect reports.
67.5. Repairs, modifications.
67.6. Locking procedures for aircraft bolts.
67.7. Belt tightening and belt grip.
67.8. Heavy landing inspections.
67.9. Corrosion / Wear.
67.10. Engine mounts.
67.11. Cage.
67.12. Propeller, prop tape.
67.13. Engine sound.
67.14. Tuning.
67.15. Ignition system.
67.16. Fuel Mix.
67.17. All secure.
67.18. Electrical.
67.19. Fuel filters, fuel lines.
67.20. Exhaust system.
67.21. Attachment points.

68. Paraglider

- 68.1. Sailcloth / stitching.
68.2. Trimmers.
68.3. Porosity.
68.4. Line stretch.

69. References

- 69.1. Manufacturer's Handbook, HGFA Operations Manual, Aircraft Log Book, Maintenance Documentation.
69.2. Powered Paragliding Bible

WHEELBASE PRACTICAL SKILLS CHECKLIST:

- 69.** Following is a checklist of skills, all of which need to be successfully achieved, demonstrated or understood, before a student can be awarded a Wheelbased Powered Paragliding Certificate.
- 69.1 Layout & Pack-up of paraglider a: Nil – Light winds
b: Light - Moderate winds
- 69.2 Assess conditions as suitable for flight – Selection of suitable launch point relative to the conditions and launch method relative to the conditions.
- 69.3 Demonstrates a thorough understanding of rigging a speed system or trim tabs and the knowledge/ability to safely utilize them.
- 69.4 Pre-flight checks:
Paramotor, Paraglider, Wheelbase, Lines, Speed System, Trimmers, Hand Throttle, Communications Equip., and any other equipment required.
- 69.5 Motor & Wheelbase Ground Handling Skills:
a: Motor pre-flight checks
b: Starting procedures
c: Propeller safety
d: Taxiing
- 69.6 Competent launch skills in a: Nil to Light winds
b: Light to Moderate winds
- 69.7 Effective use of controls during climb-out and flight:
a: Throttle
b: Trimmers
- 69.8 Demonstrates straight climb out to 500 ft with control of torque induced turn.
- 69.9 Demonstrates rear riser steering.
- 70** 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.
- 70.1 Airtime & Autonomy:
a: No less than 25 hours airtime and a minimum of 30 flights logged.
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).
- 70.2 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 Restricted 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 Restricted 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 its 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

71. 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

72. 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.
73. 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.
- 73.1. They shall demonstrate a genuine regard for safety and an attitude of willing helpfulness.
- 73.2. They shall have been recommended by their Club for the appointment, through the submission of a completed application form to the HGFA Operations Manager.
74. A PPG SO shall:
- a. have a minimum of 80 hours PPG, and
 - b. have a minimum of 2 years PPG, and
 - c. have flown a minimum of 3 different PPG wings, and
 - d. have flown a minimum of 2 different paramotors, and
 - e. hold a PPG Certificate with Cross Country endorsement, and
 - f. hold a current St. Johns First Aid Certificate or equivalent.
75. A PPG SSO shall:
- a. have a minimum of 100 hours PPG, and
 - b. have a minimum of 3 years PPG, and
 - c. have flown a minimum of 5 different PPG wings, and
 - d. have flown a minimum of 2 different paramotors, and
 - e. hold a PPG Certificate with Cross Country endorsement, and
 - f. hold a current St. Johns First Aid Certificate or equivalent.
 - g. have served as a PPG SO for at least a 4 year period
76. Any deviation from these guidelines must be justified on the application form and approved by the Operations Manager.
77. 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 Wheelbased Powered Paragliding Certificate

78. **HGFA Certificate Identification:**
 Wheel Launched Powered Paragliding Certificate – WPPG
 (or acronym as maybe designated by the HGFA administration)