



Soaring AUSTRALIA

Official Publication of the Hang Gliding Federation of Australia

**Special
Training
Issue**





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Contents

2	Welcome to the HGFA	23	Weather or Not	32	Final Solution – A Guide to Stress-free Landings
2	Membership to the HGFA	23	The IPPI Card	34	Fear and Flying
5	The HGFA Pilot Certificate System	24	How to Fly and have Fun	36	Rules of the Air
6	The HGFA Pilot Training System	26	Going Motorised!	38	245 Snakes Alive
8	Your First Aircraft (and the gear to go with it)	27	Paramotors – An Overview	40	Competitions in Australia
9	Triking Equipment	28	My First Mountain Flight	41	Guidelines for Intending Competition Pilots
11	Principles of Flight – A Basic Introduction	30	The '98 Canungra Classic – From two Newbies	44	FAI Proficiency Badges
12	Toys and Tools			44	Landowner Rights and Pilot Responsibilities
13	Landing: The Importance of Posture			46	Schools in Australia
14	How you Approach it...			48	Glossary of Terms
18	The Story of Ike Arus				
19	A Good Start to a Great Flight				
20	Which is the Right Paraglider for You?				

Brendan Watts and Shaun Wallace high over Coral Bay, SA

Photo: Paul Coffey



Official publication of the Hang Gliding Federation of Australia (HGFA).

EDITORIAL CONTRIBUTIONS

Hang gliding, paragliding, microlight articles and display advertising bookings should be sent to:

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NOTICE TO READERS AND CONTRIBUTORS

Contributions are always needed. Articles, photographs and illustrations are all welcome although the editors and the HGFA Board reserve the right to edit or delete contributions where necessary. Articles of unknown origin will not be published. All contributions should be accompanied by the contributor's name, address and membership number for verification purposes. Photographs should be printed on glossy paper either in black and white or colour. Captions and photographer's name are needed.

DEADLINE FOR CONTRIBUTIONS:

25th of each month,
five weeks prior to publication.

Photos and materials will be returned after publication only if a stamped, self-addressed envelope is supplied. Otherwise, photographs, whether published or not, will be filed and may be used subsequently in further publications.

Drawings, maps, cartoons, diagrams, etc. should be in black ink on white paper. Lettering may be pencilled lightly but clearly on the drawing, for typesetting.

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The Hang Gliding Federation of Australia is a member of the Fédération Aéronautique Internationale (FAI) through the Australian Sport Aviation Confederation (ASAC).

CREDITS

Cover: Carl Foster flies in the moonlight at Sunshine Beach, QLD

Photo: Craig Papworth

Design: Suzy Gneist, Gneist & Moffatt

Printing: Pirie Printers, Canberra ACT

Mailing: Pirie Printers, Canberra ACT

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CATEGORY	EMAIL ADDRESS	DESCRIPTION
Club News	clubnews@hgfa.asn.au	Information is forwarded to <i>Soaring Australia</i> and the maintainers of the HGFA website.
Competition News	compnews@hgfa.asn.au	Information is forwarded to <i>Soaring Australia</i> and the maintainers of the HGFA website.
Articles, advertisements	skysail@ozemail.com.au	<i>Soaring Australia</i> content only

WELCOME TO THE HGFA

Rohan Grant

THE HANG GLIDING FEDERATION OF AUSTRALIA IS A NON-PROFIT ORGANISATION, SERVING THE INTERESTS OF THE 3,000 HANG GLIDING, PARAGLIDING AND WEIGHTSHIFT MICROLIGHT PILOTS IN AUSTRALIA.

Although formerly a federation of clubs and regional associations, hence the name, it was reconstituted a few years ago as an association of members to directly serve the needs of its members. Every two years member pilots elect from amongst their peers nine representatives to look after their interests.

Known as the 'Board' or 'Committee', those nine set strategies and policies to maintain, develop and improve conditions for all of us. The HGFA uses both paid and voluntary help and other resources to deliver an extensive range of services, focussed on safety and sport, which are detailed principally in the HGFA's rolling 'Five-Year Plan' and the 'Operations Manual'.

Some examples of these diverse services include:

- development of pilot training syllabi so that new members are taught to fly safely;
- fostering and hosting fly-ins, club competitions, regional, national and world championships;
- setting and maintenance of safety standards;
- mediation with the Civil Aviation Safety Authority and other

airspace stakeholders to ensure our members have equitable access to airspace;

- negotiation of insurance coverages;
- representation of Australian interests to the FAI, the world sport aviation governing body; and
- publishing a magazine (Soaring Australia) and newsletters to communicate matters of interest and importance to and between members.

If you have any questions about the sports of hang gliding, paragliding or weightshift microlighting or the services available to HGFA members please contact the HGFA office, in person or by phone, fax or email. If you have any question about how or why a service exists, or would like to see something introduced, changed or improved, please contact your nearest HGFA Board representative.

I hope you find this special training issue of Soaring Australia, helpful, instructive and fun; and that it serves as a valuable stepping stone to a long, rewarding and safe involvement in these great sport aviation activities.



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Membership to the Hang Gliding Federation of Australia



Photo: Colleen Doyle

Ian Jarman during a club weekend training program

Ian Jarman

THE HANG GLIDING FEDERATION OF AUSTRALIA WAS ORIGINALLY CONSTITUTED TO ADMINISTER THE SPORT OF HANG GLIDING AT A NATIONAL LEVEL. THE ORGANISATION HAD EXISTED IN OTHER FORMS PRIOR TO THIS AS 'THE AUSTRALIAN HANG GLIDING ASSOCIATION' (TAHGA) AND 'THE AUSTRALIAN SELF SOAR ASSOCIATION' (TASSA). SINCE HGFA'S INCORPORATION IN 1987 DEVELOPMENTS IN OTHER AIR SPORTS HAVE EXTENDED THE FEDERATION'S RESPONSIBILITIES TO INCLUDE HANG GLIDING, PARAGLIDING (INCLUDING MOTOR ASSISTED VERSIONS OF THESE AIRCRAFT) AND WEIGHTSHIFT MICROLIGHTING.

The civil aviation laws in this country require persons acting as pilots of such aircraft to be the holders of a certificate issued by the HGFA (or AUF in the case of microlights) or under the instruction of an HGFA instructor. Primarily we are a national sporting organisation and as a result of current civil aviation regulations we also provide pilot training systems to allow people to become qualified to participate in our various sports.

The HGFA wishes to maintain its involvement at the leading edge of sport aviation development and through this we aim to provide:

- *good value sport and sport aviation services and systems;*
- *a caring and safety focussed network from our staff, elected representatives through to regional and local club volunteers; and*
- *a responsiveness to our members' sporting and aviation needs and concerns*

To assist us in providing quality services, we encourage all members to give us constructive input on any sport related matters, even if it relates to a perceived deficiency in our systems. Whilst your individual concerns are important to us, policies and decisions set by the national board are for the good of the sport and organisation nationally, but our organisation is capable of catering for a wide variety of individual and local interests. We can strengthen our organisation and its ability to advance your chosen discipline by being tolerant of other sport aviation enthusiasts, regardless of what they fly. We will listen to what you tell us as we are committed to providing a high standard of service, acting on your behalf to protect your sporting interests with due care and diligence.

Once you leave the training school, an HGFA club* will provide the best opportunities for extending your flying network to other

pilots and enthusiasts. Clubs provide the support, friendship and experience necessary for safe and enjoyable continuation in the sport, so it is important to search out a club that suits your needs. By joining a club you're helping us to keep the sport viable, as clubs are our site caretakers.

WHAT DO YOU GET FOR YOUR ANNUAL FEES?

Pilot Training and Qualification System

Apart from providing the basic legal access to our sport activities, its sites and support networks, the organisation provides a recognised program for developing your pilot skills. The HGFA Pilot Certificate system is approved by CASA and allows you to progress steadily in acquiring the skills and knowledge you need to participate at your chosen level. This extensive array of certificates and endorsements has been developed over many years to provide you with a logical pathway to acquire necessary pilot skills.

These qualifications and their associated training systems are provided as a fundamental part of your annual membership. You may need to acquire specialist training from qualified instructors to achieve the standards required in a safe and timely fashion but there are no extra HGFA charges to impede your progress in the sport. (*Refer to the article about the HGFA pilot certificate system for more information.*)

Public Liability Insurance

HGFA membership also provides comprehensive public liability insurance coverage. To access most sites and airspace in Australia you need



Photo: Peter Mardin

Lachy Fletcher (Aerodyne Jumble) over Warriewood, Northern Beaches

to carry suitable third party liability insurance. The current HGFA policy provides such liability insurance to a limit of \$10 Million. As a member you have agreed to abide by the HGFA constitution which provides for a limitation of that legal liability (so far as this is permitted by law) with respect to your rights to seek compensation against officers, agents, instructors, etc, acting in some capacity for the HGFA. In essence this limits the amount of any compensation to that which the insurer might be obliged to pay under the policy, even if that obligation is nil.

If you would like to know more about this insurance or any other sport aviation insurance products or if you are involved in an accident/incident that may result in a claim, please contact the HGFA office. Remember to never admit liability. A \$1,000 excess is payable for property damage claims and this is to be paid to the HGFA before we initiate action toward settling the claim.

wider world of sport aviation the opportunities to travel and participate in just about any country on earth are both exciting and highly rewarding.

The HGFA is a widely respected national sporting organisation with a proud history of achievement. As our sports are barely 30 years old, we combine this relatively short history with a very forward looking perspective on sport and its management. Our sports have developed from the technologies that emerged from the space program and reflect that high-tech and clean image.

We hope you enjoy your participation and strive to keep our sports safe so we can look forward to you staying with us as a long term member as we move into an exciting new era for our sports.

** A complete list of associated clubs and contacts can be found in the 'Club Contacts' insert in this magazine.*



Soaring Australia Magazine

Full membership also includes subscription to our magazine. This special training issue gives you some idea of what to expect in your mailbox each month, and contributions from members are always welcome. Soaring Australia is a joint publication of the Hang Gliding Federation of Australia and the Gliding Federation of Australia, and is not available in stores.

HGFA Operations Manual

The HGFA Operations Manual, which is issued as part of the new member package, is a manual of procedures and contains information on Government Regulations covering the sports of hang gliding, paragliding and micro-lighting, regulations implemented by the HGFA, recommendations for standard procedures and practices and references to other HGFA manuals and publications.

HGFA Log Book

This is also part of the new member package and provides a convenient booklet for the recording and logging of all your flight experiences.

Affiliations

Other benefits of membership to the HGFA include our affiliation to the Australian Sport Aviation Confederation (ASAC) and the Fédération Aéronautique Internationale (FAI), which is the world governing body for aviation sports. These affiliations provide you with the opportunity, if selected, to represent Australia at international events such as the World Championships, to attempt National and World records flights and to achieve internationally recognised flight achievement badges. As part of the

The HGFA Pilot Certificate System

Ian Jarman

THE HGFA PILOT CERTIFICATE SYSTEM HAS EVOLVED OVER MANY YEARS IN PARALLEL TO EACH SPORTS' DEVELOPMENT. THIS SYSTEM NOT ONLY PROVIDES THE REQUIRED LEGAL QUALIFICATION FOR FLYING OUR AIRCRAFT BUT ALSO PROVIDES A LOGICAL AND SAFE PATHWAY FOR PROGRESSION FROM BEGINNER THROUGH TO CROSS COUNTRY AND COMPETITION STANDARD FLYING.

PILOT CERTIFICATES – HANG GLIDING AND PARAGLIDING

For hang gliding and paragliding the required skills and knowledge for the issue of the basic qualification (Restricted Pilot Certificate) reflect the fundamental flying objectives of the new pilot: to launch, soar and land safely. The term “restricted” reflects the privileges of the certificate in that the operations are “restricted” to non cross-country soaring in a supervised environment. The assistance provided to the new pilot by the pilots supervising these first months of flying is extremely valuable in maintaining safety and limiting flights to conditions and sites that are suitable for the level of experience.

As the novice pilot's practical skills improve and broaden it is important that this is matched by further theoretical study to ensure he/she has the knowledge to assess changing conditions and new situations. The weather is not static and the pilot's ability to make safe and appropriate soaring decisions relies heavily upon being able to apply that knowledge quickly and accurately. It is therefore important that study and skills acquisition do not cease upon graduation from the training school. The Intermediate and Advanced Certificates provide a syllabus focus for that continuing study and skill development and all pilots should strive to achieve these standards in order to take full advantage of all site and soaring opportunities in a safe and controlled manner.

The requirements for issue and renewal of all these certificates and, where applicable, endorsements are more fully detailed in Section 7.3 of the Operations Manual. Variations in the requirements for flight training (practical) and aeronautical knowledge (theory) necessary for each type are detailed in Section 8 of the Operations Manual. The requirements for Hang Gliding and Paragliding certificates are summarised in the table below.

Requirement	Student	Restricted	Intermediate	Advanced
Prerequisite Qualification	None	Student	Restricted	Intermediate
Medical Standard	Equivalent to that required for issue of a driver's licence			
Flight Skill Test	None	Yes	Yes	Yes
Aeronautical Knowledge Test	None	Yes	Yes	Yes
HGFA Membership	Instructional, STM or Full	STM or Full	Full	Full
Aeronautical Experience	None	Minimum of six training days	Minimum of 25 hours logged on 25 flying days	Minimum of 80 hours logged and a minimum of 12 months experience
Privileges	See following Sections			
Validity	Maximum of 12 months or termination of membership (whichever is the sooner)			
Renewal	None	Minimum of 5 hours logged	Minimum of 10 hours logged	Minimum of 10 hours logged
Approved By	Instructor	Instructor	Member's Club (Senior Safety Officer) or Instructor	HGFA Operations Manager or as delegated

PILOT CERTIFICATES – WEIGHTSHIFT MICROLIGHTING

As for hang gliding and paragliding, the pilot certificates for microlighting reflect the basic flight objective of the new pilot: to take off, fly and land safely. Accordingly, the issue of a WM Pilot Certificate requires demonstration of the skills and knowledge required to demonstrate those competencies.

As a powered aircraft a microlight is more likely to operate from an airport or in the company of general aviation activities and the range of skills and knowledge learnt at this level involves significant concentration on circuits, communication and other airport and mixed operational requirements, hence actual “in air” training time at this stage is higher than for a hang glider or paraglider. The newly certificated pilot is still restricted to operations within 25 nautical miles of their home airfield. A cross-country endorsement which involves the mastering of more complicated navigational skills is required before the WM pilot can range further afield, as an out landing of these heavier and faster aircraft is significantly more complex and demanding than that of a paraglider or hang glider.

Although the pilot certificate provides for many hours of enjoyable flying, the other endorsements offered provide for a more complete flying understanding and experience and all pilots should be aiming to acquire those skills and experiences in a planned and logical fashion as provided for by the associated training syllabi. This is a far safer way to gain such experience than to suddenly find oneself confronted in flight by a situation that requires a new set of skills and understanding.

The requirements for these certificates are listed on the table below and further details can be found in the HGFA Operations Manual.

Requirement	Student	Pilot
Prerequisite Qualification	None	Student Certificate
Medical Standard	Equivalent to that required for issue of a driver's licence	
Flight Skill Test	None	Yes
Aeronautical Knowledge Test	None	Yes
HGFA Membership	STM or Full	STM or Full
Aeronautical Experience	None	Minimum of 20 hours logged under instruction
Privileges	See following Sections	
Validity	Maximum of two years or termination of membership (whichever is the sooner)	
Renewal Requirements	None	Minimum of 10 hours logged
Approved By	WM CFI	WM CFI



THE HGFA PILOT TRAINING SYSTEM

Ian Jarman

HANG GLIDING, PARAGLIDING OR MICROLIGHTING APPEAL TO ALL KINDS OF PEOPLE FROM ALL WALKS OF LIFE. YOUNG AND OLD ALIKE CAN BE CAPTURED BY THE SHEER THRILL OF SOARING LIKE A BIRD.

As with most sports, and more critically in any form of aviation, good instruction is essential in learning new skills. In the early days of hang gliding it was possible to be taught by anyone with some knowledge of the sport. Those days are long gone, people now expect, and indeed deserve, quality instruction using quality equipment. To this aim, the HGFA provides training and accreditation for instructors in the three HGFA air sports. To maintain their accreditation, HGFA instructors must provide quality training in accordance with the HGFA Pilot Training Syllabus and associated guidelines. When choosing an instructor you should ensure that he or she is HGFA accredited, and if in doubt, contact the HGFA National Office to confirm your instructor's credentials.

Before you start training, you will be asked to join the HGFA and you will be provided with an overview of your training program. The program will be split between the theoretical and practical aspects of your chosen HGFA discipline.

THEORY OF FLIGHT

Through the training course you will be required to study reference material which is usually provided by the instructor, as a package, at a reasonable price. You will be required to complete a written HGFA Pilot Training Workbook and before gaining your Pilot Certificate will need to sit and pass a multiple choice theory examination. The full Syllabus of Basic Aeronautical Knowledge is contained in the HGFA Operations Manual Section 8.4.

THE SYLLABUS INCLUDES:

- Basic aeronautical knowledge;
- Meteorology;
- Rules of the air;
- Soaring strategies (for hang glider and paraglider pilots);
- Airport operations (for microlight pilots);
- Observation; and
- Equipment choice and maintenance.

PRACTICAL FLIGHT TRAINING

HGFA instructors use training techniques that incorporate an explanation coupled with a practical demonstration of the particular skill you will learn; you will then practice the skill and gain feedback from your instructor until you master each of the skills you need to fly the aircraft safely.

Most hang gliding and paragliding instructors, and all microlight instructors, utilise certified two-place aircraft to provide skills training. This enables safe and steady progression through your training with the instructor in the aircraft to provide necessary feedback and advice.

The full Syllabus for Flight Training is contained in the HGFA Operations Manual Section 8.3. A brief overview of a typical practical training program follows.

HANG GLIDING AND PARAGLIDING

- Glider set-up/Pack up;
- Pre-flight checks;
- Use of controls;
- Ground handling;
- Launching the glider;
- Controlling flight path and turn coordination;
- Landing approach and flare techniques;
- Stall recognition and emergency techniques;
- High altitude flight; and
- Soaring skills.

MICROLIGHTING

- Glider set-up/Pack up;
- Pre-flight checks;
- Use of controls;
- Taxying;
- Level and straight flight;
- Controlling flight path and turn coordination;
- Take-off techniques;
- Landing approach and flare techniques;
- Stall recognition and emergency techniques; and
- Solo flight.

Once you have learnt all the basic skills, you will gain experience under your instructor's supervision until the instructor is confident that you are skilled enough to gain your pilot certificate. During this period you may also gain other skills, such as car or winch towing techniques for hang glider and paraglider pilots, or VHF radio usage and cross country planning for microlight pilots.

An integral part of your training will be an introduction by your instructor to other members of the flying community. This is achieved through your introduction to an HGFA club*, or if there is no club in your area, other local pilots. It is critical to fly in the company of other pilots in the early period of your flying to ensure that you are advised as to the suitability of the prevailing weather and any specific site requirements or hazards. Once you gain your pilot certificate, though you will be able to safely fly your aircraft, there will still be a lot to learn. Many publications are available from instructors and aircraft manufacturers (or importers) to further your knowledge. Increasing your theoretical knowledge and gaining experience will not only further advance your flying skills, but will also enhance the enjoyment of your new sport.

* A complete list of associated clubs and contacts can be found in the 'Club Contacts' insert in this magazine.

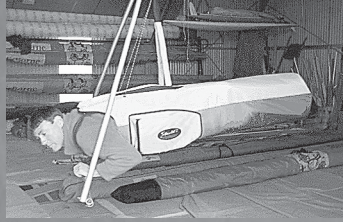


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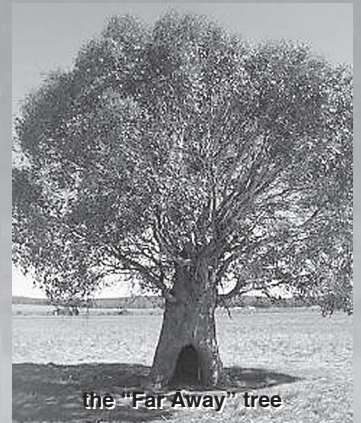
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YOUR FIRST AIRCRAFT (AND TH

Craig Worth

WELL THE TIME HAS COME, YOU HAVE HAD SOME TRAINING AND HAVE COME TO APPRECIATE THE WONDERS OF FREE FLIGHT, NOW THE BIG DECISION: WHAT AIRCRAFT DO YOU BUY? IT IS CRITICAL TO PURCHASE A SUITABLE AIRCRAFT, THIS DECISION CAN MAKE A MAJOR DIFFERENCE TO THE ONGOING ENJOYMENT OF YOUR NEW SPORT. THE RIGHT DECISION CAN LEAD TO MANY HOURS OF SAFE, ENJOYABLE FLYING; THE WRONG DECISION CAN LEAD TO NOTHING BUT PROBLEMS AND FRUSTRATION.

Differing models of aircraft vary considerably in handling characteristics, hang gliders and paragliders in particular. Accident rates support the need for new pilots to fly purpose built novice aircraft. If you purchase an aircraft that is more suited to an intermediate or advanced pilot, you will find it difficult to control, and difficult to gain feedback from the wing through control “feel”. This can lead to over-controlling the glider to the point of being dangerous, so called “pilot induced oscillation”, which, on final approach, can result in an inability to set up a safe landing. Flare timing can also be difficult to judge in higher performance aircraft.

Unfortunately, some unscrupulous pilots will attempt to sell high performance gliders to new pilots. A common misconception is that older high performance gliders are suitable for new pilots – this is incorrect. Even though such a glider may be old, it is still a high performance glider and the skills required to fly it will take many hours experience to gain. If you purchase an aircraft that requires skills you have not yet acquired, it will stifle your progress and may even lead to a frightening experience, or even injury, which could turn you away from your new-found sport.

If your budget is a limiting factor, what do you choose? A new aircraft or a good used one? Aircraft are no different to most products – the more money you spend, the better quality product you get. Obviously a new aircraft is preferable, though a good second-hand one will suffice, providing it is in an airworthy condition and had been maintained appropriately.

A thorough inspection of a second-hand aircraft by an experienced pilot is essential. Although a close inspection by an experienced pilot will usually detect poorly maintained equipment, a new pilot may not be able to pick deficient components and fabric. Major fabric deterioration due to exposure to UV is the most common sail/canopy problem in older gliders; and can usually be detected by excessive fading of fabric colours. Fabric porosity in paragliders can also seriously affect the wing's performance and flight characteristics, older paragliders should be checked with a porosity meter.

When buying a hang glider or paraglider it is essential to ensure that your aircraft is a certified model; and that it is the right size in relation to your weight. The HGFA recognises various Australian and overseas certification standards, as listed in Section 9 of the HGFA Operations Manual. Attached to each certified aircraft is a placard which states the standard to which it is certified. Also listed on the certification placard is the weight range of the aircraft. Be careful when checking that the glider is of appropriate size for you, placards on hang gliders state the maximum and minimum “clip-in weight” of the particular model, meaning the weight of the harness added to

your own body weight. Paraglider placards show the “all-up weight” so the harness and canopy weights must be added to the pilot weight. Just to confuse you, some paragliding manufacturers quote “clip-in” weight – so be sure to establish exactly what you have to measure to make sure you are within the glider's weight range. You will have to weigh yourself dressed as you would to fly (including your boots, flying suit, helmet, etc.). You must also make sure that you are at your “normal” weight, if your weight tends to fluctuate at times you should allow for this. It is desirable to be in the middle, or slightly above the middle of the glider's weight range. A glider that is too big for you will be difficult to control, to the point of stifling your progress. A glider that is too small will have a reduced sink rate and the higher wing loading will cause it to fly and land at a higher speed, thus making it more difficult to fly. A paraglider that is too big will also be more prone to collapse as the lower wing loading results in a lower internal cell pressure; and will not have as high a top speed should you be caught in an increasing wind.

It is critical to seek advice from a qualified person as to the aircraft best suited to you. This advice can be from either your instructor, a reputable importer or a manufacturer. If you are uncertain of the advice you are getting, seek a second opinion.

HANG GLIDER MODELS

In recent years a new breed of “floater” or “fun” type gliders has been developed. These are open crossbar gliders, ideally suited to pilot training, as a first glider or as a fun glider for a pilot of any skill level. The flight characteristics of these gliders make them easy to launch, fly and land; they will maintain controllability at low speed; provide plenty of control “feedback”; and allow a new pilot extra time to set a chosen glide path or landing approach. These are by far the best and most forgiving hang gliders for pilots new to the sport.

There is also a range of “novice/intermediate” hang gliders that some new pilots prefer (these are listed in Appendix 4 of the HGFA Operations Manual). These gliders usually have the crossbar enclosed in the double surface of the sail and fly faster than the “floater” type gliders. They are therefore slightly more difficult to fly. A new pilot must gain at least several hours airtime on a slower glider and be introduced to this model of gliders by their instructor. This enables the instructor to ensure that the pilot understands the idiosyncrasies of the particular model; and most importantly, to ensure that the flying conditions on the day are suitable. It is recommended that new pilots gain at least their first few hours in these “novice/intermediate” gliders under the supervision of an instructor.



E GEAR TO GO WITH IT)

Photo: Joe Faulds



Clayton Isbel flying an intermediate glider in WA

Whatever model hang glider you buy, it is imperative to fit wheels to the control frame base bar. In the event of a hard landing, wheels will minimise the likelihood of injury and at the same time lessen the likelihood of damaging the glider.

PARAGLIDER MODELS

There are numerous paraglider models available, suited to all levels of pilot skill. The new pilot must purchase a paraglider that is certified, and suited to both pilot experience and pilot weight. When being tested for certification, each paraglider model is flown by qualified test pilots and categorised depending on the glider's performance; handling and flight characteristics; and most importantly, collapse recovery characteristics. Please refer to the article on the certification of paragliders in this magazine.

It is imperative that the new paraglider pilot purchases a canopy specifically designed for the beginner or novice pilot. Buying a paraglider that is certified to a higher category will undoubtedly lead to problems – during launch, in-flight and when landing. There is a common misconception that by flying a more advanced glider your skills will improve more quickly. In fact, the opposite is the case, development of pilot skill will be much slower in a canopy that is more difficult to fly.

Many beginner gliders are fitted with a speed bar, which enables the top speed of the glider to be increased by lowering its angle of attack and therefore changing its flight characteristics, making it more prone to collapses. When buying a glider fitted with a speed bar it is essential to gain an understanding on how the system is fitted and adjusted. Seek advice from your instructor as to when, and to what degree the speed system can be safely used.

MICROLIGHT MODELS

Microlight pilots have the advantage of being able to readily fly various models (with an instructor) and make a decision as to which model they prefer. Microlight models vary in cruising speed and handling; a new pilot should seek advice from their instructor as to which model will best suit their circumstances. More recent models, such as the Australian made Airborne Wizard, are easy to fly and land, as well as being ideal for aerotowing, and are best suited to a new pilot. Faster models such as the imported Pegasus Quantum (made in the UK) or the Airborne Edge would suit a pilot seeking an aircraft with a faster cruising speed. Prices vary, the most expensive being the new imported aircraft, followed by new Australian microlights and then second-hand aircraft. Buyers of older microlights should be cautious of "bargains" that can often be a source of



Rob talks to a bunch of pilots at High Adventure Airpark

Triking Equipment

Rob Hibberd, Airborne Windsports

What equipment to buy can be confusing for the trainee pilot. Whether you are a trike (microlight), hang glider or paraglider pilot, often your instructor can help you not only choose the best equipment for your needs, but can also supply it. Most instructors are agents for the particular aircraft they teach with and the accessories you will need along the way. Here's some guidance on what equipment is generally recommended for triking.

An airspeed indicator, altimeter and hour meter are all mandatory instruments required to be fitted in the aircraft by law. It is also sensible to include some engine management instruments, like temperature gauges and a tacho.

A good intercom system is a must in a trike. Don't be fooled into buying a general aviation system, they don't work very well in an open cockpit. Your instructor will be using one of the best systems available and will have access to these when you are ready to order.

Airband radio is essential if you intend to fly at airports or in allowed airspace. You cannot go wrong with Icom radio equipment. The intercom system you buy should allow an input and push to talk (PTT) for the type of radio you intend to use.

Global Positioning Systems (GPS) are popular with all pilots. A GPS does not only show your position and can navigate you to a logged in waypoint, it can also tell you your speed over the ground. This is very useful, for example if you are flying a trike cross country and find you are not making much headway, a GPS can tell you your different ground speeds at certain altitudes so you can pick your flying height to get your best possible ground speed (this principle also applies in hang gliding and paragliding and many competition pilots in these disciplines use a lot of information from their GPS). GPS is a great instrument to use on a trike. The handheld variety is a nice way to go and it can be mounted easily somewhere on the trike. There are many types of GPS available and most seem user-friendly. I have had experience with the Garmin 38, 45 and now the 12 XL – all work well in a trike.





Photo: Gordon Marshall



Safe equipment made Gordon Marshall's flight at Cottesloe more enjoyable

problems. Demand to see an aircraft log and check to see that the logged maintenance has indeed been carried out. It is recommended to have the manufacturer or at least a manufacturer's service agent thoroughly inspect a second-hand aircraft for defects and wear. Though there are many good second-hand microlights available, aircraft with many hours can lead to expensive repairs and replacements. Seek good advice.

HARNESSES

Whether you fly a hang glider or a paraglider, choice of your first harness can be as critical as the purchase of your glider. Again, a new harness is preferable and a second-hand harness must be checked out

for deterioration and wear by an experienced person. As your harness will often last you a lot longer than your glider, it is desirable to buy a harness that is not only comfortable and of appropriate size; but also a harness which is compatible with the glider you first buy, as well as future gliders you may progress into. It is critical to ensure that the harness is easy to get into and out of in flight, and to transfer from the vertical (or "hang" position) into either a prone or seated position. Leg loops of inappropriate length can lead to problems in controlling the glider during launch and landing. The length of leg loops should be adjusted with the assistance of your instructor or the harness manufacturer. Paraglider pilots are strongly recommended to buy and use a harness with back protection.

ANCILLARY EQUIPMENT

Emergency or "reserve" parachutes must be of appropriate size for the total aircraft, harness and pilot weight. When buying a second-hand canopy it should be carefully checked for fabric and line wear or deterioration. More critically, the reserve must be packed regularly and must be fitted into its stowage compartment in accordance with the harness manufacturer's specifications. There have been several instances of inadequately stowed parachutes deploying in flight.

When buying a helmet it is essential that the helmet is of the correct size and, if it is second hand, that it has not been damaged. The HGFA Operations Manual Section 9.1.4 lists the recommended criteria for helmets. It is also recommended that hang glider and paraglider pilots' footwear should provide ankle protection.

Purchasing the right gear and maintaining it as required is essential for the ongoing enjoyment of all sport aviation and will lead to many happy landings.



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PRINCIPLES OF FLIGHT

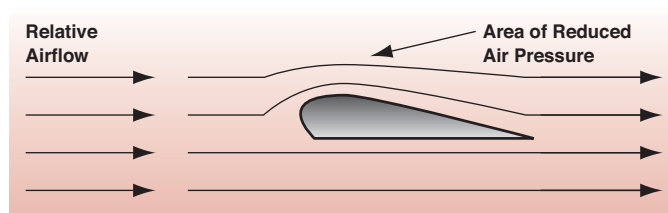
A Basic Introduction

Paul Haines

IN ORDER FOR ANY MACHINE TO FLY, WHETHER IT IS A HANG GLIDER, PARAGLIDER OR MICROLIGHT, IT IS NECESSARY TO HAVE AIR FLOWING PAST THE SURFACE OF THE WING. ONCE THIS CONDITION IS SATISFIED, A WING GENERATES LIFT. NOW, IT DOESN'T ACTUALLY MATTER IF THE WING STAYS STILL AND THE AIR FLOWS PAST IT (AS IN A WIND TUNNEL), OR IF THERE IS NO WIND AND THE WING MOVES FORWARD THROUGH THE AIR (AS IN GLIDING DOWN A MOUNTAIN SLOPE). ALL THAT MATTERS IS THE RELATIVE AIRFLOW. LET US LOOK AT HOW A WING GENERATES LIFT:

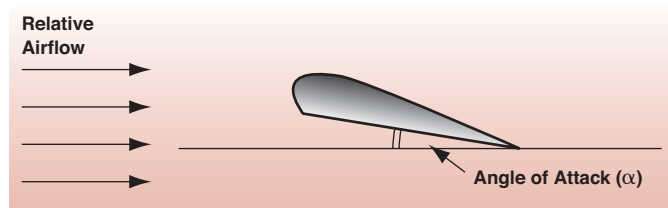
An aerofoil section causes the airflow over the top surface to travel faster than the air passing underneath. This creates an area of reduced pressure on the top surface, lifting the wing upwards.

This is only part of the picture, as the aerofoil is also inclined to the relative airflow at a small angle called the angle of attack (α).



This angle of attack deflects the airflow downwards, producing an upward reaction in the wing.

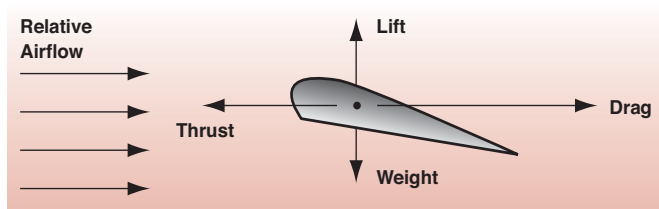
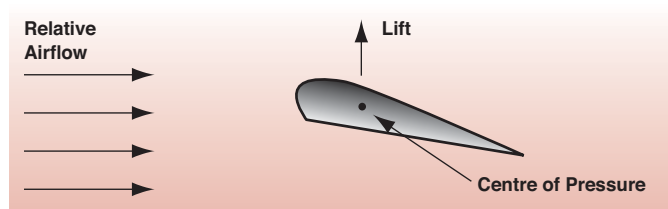
The total of these two factors can be represented by a single arrow, lift, acting upwards at the centre of pressure.



So is flying that simple? All we have to do is keep our aerofoil shaped wing moving at a satisfactory airspeed, and a satisfactory small angle of attack, and we produce lift.

Well, although this is true, the picture is a little more complicated than that. For example, your weight acting downwards tends to oppose the lifting force. The production of lift also carries a penalty, drag, which tries to slow you down. This can be overcome to some extent by using a motor to produce thrust forwards.

Putting all these four factors together creates the classic picture, known to every aviator.



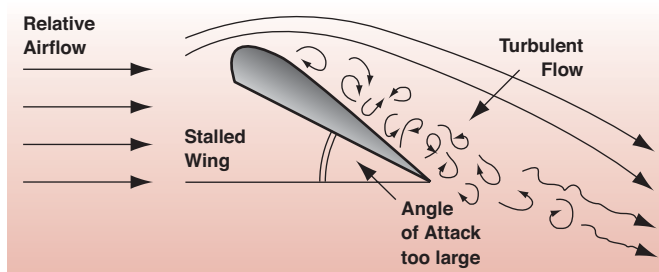
Note: in unpowered flight, the 'thrust' is provided by continually gliding downwards, like a bicycle freewheeling downhill.

If we examine the diagram more closely, we will see that as long as thrust equals drag, and lift equals weight, we can continue flying straight ahead without speeding up or slowing down, and without gaining or losing height.

Passenger jets do this every day of the week, although in the gliding world, much more depends on the weather conditions and whether there is any vertical movement in the air itself.

This article is just intended as a simple introduction, but it would be remiss not to mention the last phenomenon, the dreaded stall.

Basically, a stall is caused when the angle of attack of the wing to the relative airflow is much too large. This causes a breakdown of the smooth airflow over the top of the wing, accompanied by a huge increase in drag, which causes the airspeed to decrease. The lift is destroyed and the wing falls downwards.



With sufficient height, recovery from a stall is simple (just decrease the angle of attack until the wing flies normally), but stalls low to the ground have killed many pilots in the past 100 years, in all types of aircraft, of every shape and size.



Paul Haines is a CFI for microlights and operates his school, †"Sydney Microlight Centre", out of Wollongong airport, NSW.



Toys and Tools

John Chapman

“HELMET, HARNESS, HANG/PARAGLIDER”, GOES THE MANTRA AS YOU PACK THE CAR AT THE START OF A DAY’S FLYING. THESE ARE THE ‘MUST HAVE’ ITEMS, BUT THERE ARE OTHER THINGS THAT MAKE

FLYING MORE FUN, EASIER OR SAFER.



Photo: Craig Taylor

HELMETS

Cost: \$40-\$300

Since helmets are essential (and mandatory) let’s start there. As you will (hopefully) be wearing it for a long time, it needs to be light. Although not at all recommended, this accounts for the popularity of bicycle helmets, but choosing a hard shell can be very important. Ridges and mountains are rocky places and intrusion protection needs to be considered – not much of that with just a foam bike helmet!

Full face helmets look cool, but can restrict your vision, so make sure your helmet has been designed specifically for hang/paragliding use. Modern kevlar or carbonfibre helmets give the best protection, but come at a cost. Ideally, you should wear a helmet before you buy it, not only to test the comfort, but also to see if any part of it obstructs your vision while wearing it.

The helmet’s foam lining is designed to progressively collapse in a crash to extend the time it takes for your head to come to a complete stop (deceleration forces on the brain are the main source of brain damage). Expanded foam can only collapse once which is why you should replace a helmet that has suffered a substantial crash. Take care to inspect a second-hand helmet for any damage that may make it useless in a crash and don’t neglect strap strength and security either – it’s no use if your helmet comes off in a crash! Consider this: “A \$50 helmet for a \$50 head” What’s yours worth?

INSTRUMENTS

Cost: Variometer (with airspeed indicator) \$200-\$650, GPS \$350-\$1,000

When you first start flying you won’t need to know much more than your height (either above the hill or above sea level) and whether you are going up or down. This is what variometers are for and they do it by measuring the change in air pressure with height. A good vario is

so sensitive it will read the difference in altitude between your head and your feet.

If you are going to go over 300 feet above ground level then you are required by law to carry an altimeter that can be adjusted for sea level pressure (QNH). Most varios come with one or two altimeters built in. All current varios also have an audible function so you don’t need to keep looking at the instrument. There is no nicer sound than your vario telling you that you are going up at a great rate, although the sound of the sink alarm can be very depressing.

Later on you may want to know much more about your aerial situation such as speed to fly, final glide angle, mapping thermals and position. Current instruments can tell you all this, but at a price. Decide how much you really want or need to know before you buy.

RESERVE PARACHUTE

Cost: \$300-\$750

One of those things that costs a lot, but you’ll hopefully never need to use. About 99% of pilots flying with rescue systems have never used them, and never will, but think of it as insurance. There are many brands and types, but the basic round parachute, with or without a pulled down centre (apex), is simple and reliable. You can pack these yourself from the instructions in the manual or attend a parachute deployment and repack night organised by most clubs once a year (you should practice deployment).

If the reserve is attached to a hang glider then it is recommended that the bridle be at least 8.5 metres long so that the parachute can inflate clear of the wing tips. A fitted swivel can prevent the glider from winding up the parachute as it spins down.

A parachute can inflate safely next to a collapsed paraglider, provided you pull in the paraglider after reserve deployment to prevent it wrapping around the reserve. Keep your parachute clean and dry, and hug it occasionally.

RADIO

Cost: \$100-\$600

UHF 40 channel CB is commonly used in Australia while overseas, Airband VHF radios are the legal norm, but require a special licence within Australia. Foreign pilots often have trouble understanding why Australian authorities make life so difficult for them, but then sometimes, so do Australian pilots.

UHF radios are simple, cheap and reliable over line-of-sight, can use repeaters for a wider range and, if wired into a speaker and earphone in your helmet with a PTT (press to talk) button close to hand, they are very useful for keeping in touch with flying buddies or that all-important retrieve driver. They are a must for tow launching!

Usually the larger they are, the cheaper, so a car base station can be bought for less than \$100 second-hand and handhelds start from



\$250 up to \$600. Take some trouble to get a good aerial set-up and if you are not that way inclined, get advice on mounting the system. Battery life is improved by fully discharging and recharging and it's a good idea to carry a spare.

WATER, MAP CASE, CAMERA, HOOK KNIFE

All these useful "could haves" become more necessary as cross-country flying becomes more than a possibility.

Flexible, backpack water carriers from camping shops are the most convenient and allow you to walk around the set-up site with a handy drink source to maintain hydration – very important in Australia.

A map case with a useful scale map (about 1:250,000) or VTC let you know where you are, where you want to be and how high you are allowed to go to get there. These can be clipped to a downtube or fitted into the back of bar mitts.

When required for a competition, cameras need a databack feature to put the time and date on the print. Otherwise any "point and shoot"-type camera is suitable to record your airy adventures. Starting with handheld, you will soon be considering keel or wing tip mounts to get the classic magazine shots – you need an electric shutter release for that.

"For around \$500 it is possible to buy a very good altimeter/vario with five flight memory and an input for an airspeed indicator. For most pilots this is all they'll ever need to fly hundreds of kilometres cross-country."

Rob Hibberd, Airborne Windsports

Hook knives are for cutting the hang loop or lines in an emergency and are recommended for towing (to cut the bridle in the event of a hang-up), flying over water and to get away from the glider quickly if necessary (such as when stuck up a tree or being tumbled or dragged). Get a big one so you can get a good grip (the Jack-the-Ripper brand is the most popular) and mount it where you can get at it easily.

This is only a very brief article on the huge subject of flying accessories and a lot more can be said about using them. All of these exciting toys can make your flying more fun, but don't neglect the fact that most of these have safety value too. To venture into the strange territory of the sky people needs more than just a set of wings – so be properly equipped to fly far and fly safe



Please note that the starting price mentioned is for second-hand equipment, and all prices are approximate.

LANDING: THE IMPORTANCE OF POSTURE

Lex Jones

WITH THE ADVENT OF HIGHER PERFORMANCE, MORE RESPONSIVE GLIDERS AND MODERN HARNESSES, SOME PILOTS ARE HAVING DIFFICULTY CONTROLLING THEIR GLIDERS ON FINAL AND DURING THE LANDING PROCEDURE.

Many harnesses have a tendency to hold the pilot's torso at a 45° angle forward when in hang. This is great for that strong run on take off and easily slipping into prone, but on final it is a disadvantage.

Once your torso is at a different angle than your legs, ie: torso at 45° – legs vertical, you have an upper body/lower body split. This allows your weight to pivot around your hang point instead of being effectively shifted. As directional control relies on effective weightshift, the pivoting/twisting caused by incorrect posture reduces directional control dramatically.

This posture also causes major problems with flaring the glider by limiting the amount of pitch input. Try it yourself: Stand upright and raise your arms directly above your head à la textbook light/still wind landing flare. Next, put your arms by your sides, bend forward at the hips until your torso is at 45° and attempt the full flare position. Obviously, a full flare from this position is impossible.

To correct the natural tendencies of the harness, you must make a conscious effort on final to arch your back and remain as upright as possible. Merely arching your back will make your body hang nearly vertical – a slight downward pressure on the uprights completes the transition into vertical hang position.

Also, keep your shoulders parallel to your base bar when applying roll inputs. It is impossible to twist your body around your hang point when your shoulders are parallel to the basebar. Again, effective weightshift.

In addition: Cross your ankles. OK, so you look like a 'woos' but who cares? It gives you pendulum stability and limits the upper body/lower body split particularly under bumpy conditions when you want maximum weightshift control. *(This technique is also very useful while towing up behind a car or winch, especially in rougher air, for the same reasons as described above. Ed)*

So, in summary, here is your final approach check list:

- *At no less than 100 feet (inland) you are in hang, flying straight into the landing area: Shoulders back, chest out, back arched, ankles crossed, body upright, loose grip (with slight downward pressure to keep your body vertical).*
- *Pull on speed and fly it in, knowing that you can effectively control your direction and that you have the correct posture to give a full flare to finish your landing.*

Let's face it, a controlled approach finished with a full flare makes flying with your ankles crossed look like the right way to do it.

So check your posture on final and many happy landings!





How you approach it...

LANDING APPROACHES IN WEIGHTSHIFT MICROLIGHTS

Tony Dennis

WHY DO SOME PILOTS MAKE LANDING LOOK SO EFFORTLESS AND EASY WHEN YOU'RE A BEGINNER? THE AIRCRAFT SEEMS TO FLY IN AS IF IT IS ON RAILS TOWARDS THE AIRFIELD, ROUND OUT AND LAND AS LIGHT AS A FEATHER. THEN WHEN IT'S YOUR TURN TO HAVE A GO, IT FEELS LIKE YOU'RE WRESTLING A BULL. WHAT DO THEY DO RIGHT THAT YOU MAY BE MISSING OUT ON?

We teach a lot of people to fly and obviously landing is a major part of our training. In trikes we should get a couple of things clear to start with: Let's look at some basic features of a weightshift microlight and ourselves as human beings and what we see and perceive to be happening. By the way,

everyone has trouble landing at some stage in his or her flying career – you're not Robinson Crusoe – it's not just you.

The first thing we should get clear on our landing approach (just to get it out of the way) is that we've done our pre-landing checks, ie: brakes off, undercarriage straight, speed sufficient, fuel sufficient and harness,



Tony with his student in the back seat

helmets, hatches. I always tell my students that mistakes don't happen at five feet when landing – they're usually made at 500 feet. I'll explain why a little further on. When landing a weightshift microlight, taking time on your final approach is most important. Just like parking your car. It is difficult to park your car while you're talking on your

Left: CFI Paul Haines on circuit over Wollongong airport

mobile phone and the kids are yelling in the back seat. Try to remove a few of the distractions before going onto final.

Let's now have a look at the three basic components: AIR-MAN-SHIP. We'll start with the ship: A weightshift microlight. What a funny name! The first mistake people make when landing is that they do not stop to think what a weightshift microlight really is. Let's look at the two basic components: We have a very strong hang gliding wing and we have a three-wheel pod with an engine strapped to it hanging from a nice big bolt. Something I always emphasise is that we fly the wing, not the pod. The pod is just a convenient comfortable way for us to suspend ourselves under the wing. It is not really a directional control device other than that the weight of the pod moves around the centre of gravity of the wing thus controlling the wing. So the pod really just gives us a strong vehicle to ride in and the fibreglass just gives us some wind protection and maybe a small amount of physical protection. The engine just provides altitude, not speed. Remove your thinking away from the pod steering the wing exactly where it should go to thinking about steering the



CFI Tony Dennis runs "The Right Altitude" school in Benalla, and has organised many cross-country trips and get-togethers for microlight pilots over the years

wing to where it should go. Or to put it another way: The pod is a bit like a trailer behind a car. It will follow the car just like the pod will follow the wing a second or two behind.

Now the MAN: Being the men and women we are, we like to stay in control of things. Let's look at the physical realities of landing our weightshift microlight. I'll give you a good example you can try yourselves to explain this point:

Find a stretch of road or a wide straight line that goes off to the horizon. Point your index finger to the sky and hold it about 300mm in front of your nose. Keep both eyes open, of course, and look down the road off to the horizon. First pick a point down the road about 300m away – look

how wide your road is at 300m compared to your finger. The illusion you get is that the road is not much wider than your finger. Now repeat this and look about 20m in front of you – the road looks 100 times wider, yet your mind thinks the road is a lot smaller 300m away. Finally move your finger sideways about two inches and look at the road 300m away and then 20m away – one is difficult to line up, but the road close to you is very easy to line up because it appears wider.

Let's get back to the SHIP for a second: By design, a trike has a pole in front of the pilot that triangulates the pod to give it strength. Unfortunately it is about two feet in front of your nose. From 500ft on our final approach, the end of the airstrip looks about three inches wide and this front pole is about 1 inch wide, combined with the fact that the wing reacts quicker than the pod. Being the control freaks we are, we spend most of our final approach trying to line up this funny pole in front of us with this thing on the ground that only looks about three inches wide. I liken it to rowing a boat. It's great if you need the exercise, but why bother?

Your average training airfield main runways are usually at least 50 to 200ft wide and 500 to 1,000m long. If you think about it, that's quite a big area. Why do we have

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trouble landing on this massive lump of land? It's because we've tried to line up the pod at 500ft, which distracts us all the way to the ground, when really we should be making the minor adjustments to line up our wing and just fly it to the ground. Now we know that we should only fly the wing and not get too accurate until we're a lot closer to the ground, there's really only another couple of considerations we have to take into account.

Speed. Our airspeed is critical for a safe landing. What controls the airspeed in a weightshift microlight? If you said the engine, you're wrong. The speed in a weightshift microlight is mainly controlled by the position of the control bar. Maintain your airspeed at least at trim plus five knots, in windy conditions at trim plus 10 knots. Remember that the airspeed is a control bar position, not necessarily control bar pressure – as you accelerate and fly through turbulence those control pressures may vary. Next, look out ahead. As human beings we spend most of our day looking at the ground (unless you're a pilot then you spend most of your time looking at the sky!) When landing, if you look too far over the nose at a point on the ground, then you tend to have

trouble lining up our aircraft because, again, visually your pod seems so much wider than the small point you've picked on the ground. If you're having trouble rounding out too early or too late then you're looking at the wrong spot. This is a new skill, so we have to teach our mind and our eyes to look out ahead at the big picture and not at a small impact point in front of us. An easy way of doing this is to tell yourself on final to look at all of the runway – try to have all of the runway in your field of view, never just one single point. One of my students once said, "If the ground is rushing by, you're looking in the wrong spot!" – never a truer word spoken. It's just like driving your car with your head out the window watching the white lines go by – you can't drive like that for very long, so why would you expect to be able to land like that?

Finally the AIR: How does that affect our landing approach? Again let's get back to the pod – that damn pod! *"I'm coming in to land and I can never get it straight – if only I had a rudder!"* Forget the pod. Remember, it's only there to keep the wind off us and to make it comfortable for us (and to look good). If you have a crosswind or turbulence in the wind, don't be concerned where the

pod is pointing – just think of flying the wing. Steer the wing and fly it to a point on the horizon in line with your runway. People get too concerned at what the pod is doing. There is no need to have all three wheels lining up along your runway, especially at 500ft. A weightshift microlight will always land back wheels first and pull the pod straight (as long as your steering is straight and relaxed) due to the castering effect on the front wheel of modern trikes.

In summary, just follow the basic rules of aviation: Aviate, Navigate, Communicate (in that order), get your pre-landing checks out of the way early, line up on final at least 500ft above ground level, set your airspeed up and remember to maintain the control position, have a good look at the whole airfield as you approach it and most importantly: Fly the wing, not the pod. You're learning a physical skill – remember it's just a new hand/eye co-ordination skill and just takes time to learn. You're not going to land on a spot in the first five minutes of training, so don't even try. The accuracy will come with experience, and most importantly, no two landings will ever be exactly the same.



Photo: Gerry Charlesbois

aerodyne

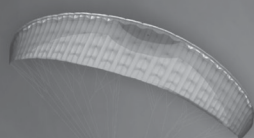
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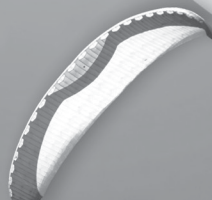


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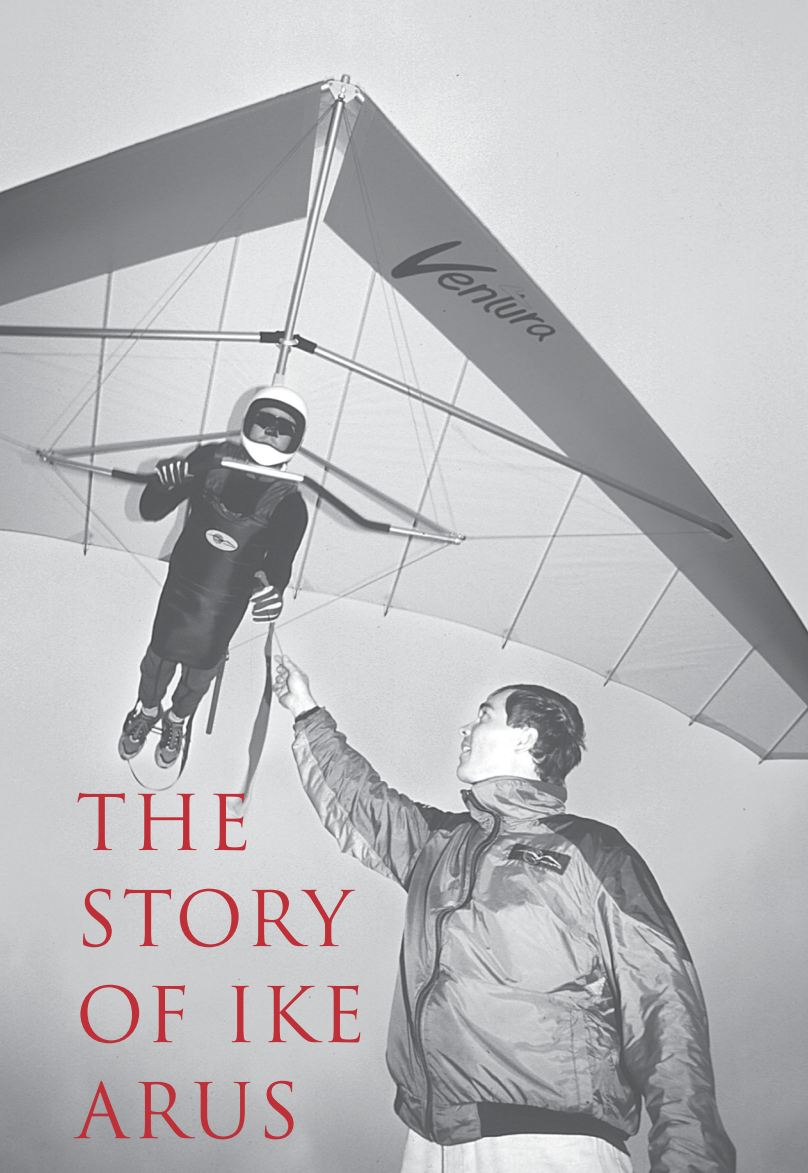


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THE STORY OF IKE ARUS

THIS IS A TRUE STORY. ONLY THE NAMES
HAVE BEEN CHANGED.

Chris Salmon, Moyes Gliders

Ike Arus was raised on a farm outside of Crete, North Dakota. His love of flying began at the impressionable age of four when he first gazed skywards to witness his Grandpa flying his old Steerman crop-duster across the family's wheat field. It was only natural then that after his Grandfather's passing Ike wanted to learn to fly. He sought out the local instructor, and after 40 hours of lessons obtained his unrestricted pilot's licence.

He emerged from his instruction confident, self-assured and ready to tackle the skies. Like his Grandfather before him, Ike's one aim upon getting his license was to purchase his own plane. Ike had inherited money from his Grandfather earmarked for just this purpose, so cost was not an issue. His instructor had a couple of recommendations: "A Piper Cherokee?" "Can't go high enough," Ike countered. "A Cessna 172?" "Too small," responded Ike. His instructor suggested that perhaps Ike should buy his Grandfather's Steerman. That plane had been buried with his Grandpa according to his last request, answered Ike, and he loved his Grandpa too much to dig it up. No, none of those planes were suitable.

Then one day while Ike was out combining the fields, he saw flying across the sky the plane he wanted. He studied it in great detail. He brought an aviation book and digested all the specifications on it.

HANG GLIDING

It was listed as one of the most popular planes of the century. Yes, this was the plane he would buy. He located a finance company that was selling some older versions of the plane. They told him that they had such a plane in storage in the desert and would get their pilot to fly the plane to him. When the day of delivery arrived, Ike made the 40 mile trip to the city airport to pick up his plane. Ike was lead to a parking bay at the rear of the airport by the pilot who'd flown the delivery and now patted him on the back saying, "She sure is a beauty!" Ike stared up at his new plane in wonderment. He was going to do fabulous things in this aircraft – and it was bigger than a Cessna and faster than a Cherokee. Yep, he and his new Boeing 747 were going to go places!

The story sounds unbelievable, but aside from names like 'Boeing' and 'Ike Arus' it is true. For the Boeing 747 we could substitute 'Xtralite', 'Shark' or 'XS' or any other manufacturers high performance glider. We all know many pilots like Ike and we certainly know pilots willing to sell their high performance gliders for no other reason than gain.

Instructors are by far the best advisors when it comes to buying equipment as they have a thorough knowledge of just what is on offer in the market place. Since they do have the flying longevity of their students in mind, they will usually steer their graduating students into gliders that are easy to take off in, easy to fly and easy to land. There is an abundance of high performance for sale. Tread warily! These gliders have usually been flown by pilots with many hours of experience. The statistics in hang gliding are usually the same as mainstream aviation. Pilot error is by far the biggest singular cause of flying accidents, and this doesn't only refer to judgment errors made while flying; they can be errors made even before a pilots gets

Left: Moyes Ventura – Below: Airborne Fun



Photos: Max Wiener



off the ground, even before a pilot purchases his/her own equipment.

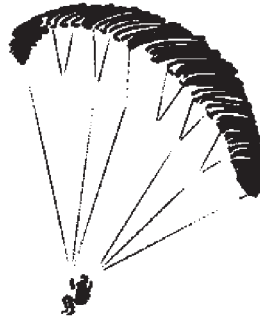
Australian manufacturers have taken steps to producing gliders specifically designed for the novice pilot. The Moyes Ventura and Sonic as well as the Airborne Fun are gliders that have just been released in recent years to respond to the call for user-friendly gliders for students. These gliders have been created to ensure a smooth transition from being a novice pilot to gaining more flight experience because they are simply easier to fly.

Another true story – totally true this time: In the mid-80's, a Canadian airline had just taken possession of their new 767 for which fuel was to be measured metrically not imperially the first time. Because the cockpit fuel gauges were not operative, the Captain gave the order for the Toronto refuellers to 'dipstick' the fuel tanks in order to calculate the fuel levels. Used to dealing in imperial measures, the refuellers converted the volume incorrectly so that at 33,000ft, full of passengers bound for Winnipeg, the plane ran out of fuel. The Captain quickly trimmed the plane and glided from 33,000ft with no hydraulic power to land in an old abandoned military field with no loss of life. When asked how he had achieved this feat when experienced pilots in subsequent simulations didn't even come close, he said, "Experience." Experience flying jets? "No – sailplanes." He had flown gliders for years and there was no substitute for that experience. He went on to say that he had landed gliders many times without engines before tackling that fuel-less 767.

The statement: "There is no substitute for experience," may be better qualified by saying that there is no substitute for the right experience. Making a steady progression from a novice pilot to an intermediate and on to an advanced rated hang glider pilot will be much more achievable, and certainly safer, if the gliders match the level of pilot experience.



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A Good Start to a Great Flight

Phil Hystek

To many pilots, a flight consists of cruising around at altitude having fun, thermalling, going cross-country and generally enjoying the sensation of free flight, and seem to regard launching as an inevitable necessity. Because launching only takes up a fraction of the flight time, it can often be glossed over by a good flight.

Launching, together with landing, is an integral part of every flight you will ever undertake. For this reason, pilots should continually work at developing and maintaining a perfect launch technique.

Reasons for having a good launch technique are:

- *Flawed launches are a major cause of injury amongst pilots of all experience levels;*
- *Launching is a time during flight when you will be flying the closest to the ground as well as flying the slowest.*
- *Your proximity to the ground will mean rougher air especially in thermic conditions.*
- *A good launch technique allows you to concentrate more on the middle, and most enjoyable, part of your flight.*
- *With a good technique you can launch where you wish, at the exact time of your choosing, and be in the air in the best conditions.*

A common flaw in most bad hang glider launches is 'popping the nose' or pushing the control frame out when starting your launch run. In paragliding, the problem is 'accelerating too quickly', letting the glider fall behind and dragging it off the hill. Both these techniques result in the gliders nose or leading edge rising to an angle

too high for safe flight. The wing of both a paraglider and a hang glider need to be at the correct nose angle to the wind (slope) in order to produce the lift required for flight. This angle is usually no greater than 10 degrees.

The secret to the perfect launch is smooth and progressive acceleration to a good airspeed while keeping the gliders nose down. This can be achieved in a paraglider by adopting a lean through body position with your shoulders through the risers, hands as high as possible behind and your head and shoulders out in front.

In a hang glider, keeping the nose down is achieved by pulling the control bar in slightly with a light grip and leaning through the uprights to pull the glider with your harness strap. The perfect launch will have you flying away from the hill in a safe and controlled manner with sufficient airspeed to give you maximum control of your aircraft. Remember to look along, and run down, the imaginary line to your chosen launching target during your run. Your instructor will give you the grounding for a perfect launch, but it is up to you as the pilot to maintain, and even improve, the technique.

Take time to sit on the hill and look at other pilots launching. Ask for tips from those pilots who you think have the best technique. Take a hiatus from flying, and return to the training hill if you feel your launch is not up to the demands of the task.

**REMEMBER, YOU ONLY GET
ONE CHANCE PER FLIGHT
TO DO A GOOD LAUNCH. MAKE
IT A GOOD AND SAFE ONE.**



WHICH IS THE RIGHT PARAGLIDER FOR YOU?



Godfrey Wenness

ADVICE ON BUYING BASICS AND GLIDER CLASSES.

The technology in paraglider design is constantly improving, providing pilots with ever increasing performance and safety. The modern paraglider, whilst owing its concept to ram-air parachutes and a NASA patent in the mid-1960's, is a far cry from them and the early nine and eleven cell "flying air mattress" gliders of the late 1980's. Nowadays designers are excelling in pitch stability/dampening and profile rigidity so much so that the planforms and aspect ratios of race prototypes from just a few years ago are quite at home on school gliders now! The newest intermediates are gliding at 9:1 and some race prototypes have hit the magical 10:1 – all this in just over a decade since 5:1 glides were the norm.

The two main certification standards – the German DHV and the French AFNOR – have evolved in time too, and pilots must be aware of changes which unfortunately make it difficult to compare current glider certification to that of the mid-1990's and earlier.

The soon to be adopted CEN standard will make comparisons even more difficult

and thus expert advice from instructors is needed.

When buying a new glider you mainly pay for design, potential airtime and resell value. These factors are directly related to the build quality (materials, construction, etc), the quality of the design itself, class of glider, after sales service of the dealer (including trade-in potential at a later date), the image and stability of the brand in the market and so on.

When looking at second-hand gliders, one must consider the above factors and also porosity, tear strength, repairs and hours. The logged hours factor is also influenced by type and location of use. Factors such as towing, paramotoring and aerobatics all reduce the longevity and thus value of a wing. Where the glider has spent its hours flying also contributes to its second-hand value – coastal gliders which suffer from moist conditions and mechanical abrasion (sand, etc) wear quicker than those used inland on grassy slopes for example. Value itself is directly a function of those factors and the initial build quality. Intermediate

and high performance gliders devalue at a much higher rate than entry level gliders due to less demand for older examples of those classes.

The search for a new glider can lead the unwary into a puzzle of conflicting claims. Many new pilots have been burnt with an unsaleable and unserviceable "cheaper" new or second-hand glider from the Trading Post, visiting foreign pilot or a non-professional or non-school importer.

When buying a second-hand glider remember this: an old 'High Performance Class' glider will always be just that, even if the actual performance (or its aspect ratio) doesn't come up to scratch with current beginner gliders. With ever improving efficiency and design, the new breed of first gliders (Basic Intermediates) are performing as well as the high performance wings of just a few years ago!

With all these issues in mind there needs to be a conscious decision as to the class or type of glider to buy – this is regardless of whether it is your first, second or fifth wing. The class of glider will reflect its safety but not necessarily its suitability to the individual pilot.

Flying a glider above one's ability though, is a sure way to come to grief. We don't teach on competition gliders for that

Understanding the certification tests is difficult. The AFNOR tests give a pass or a fail for a particular category that the manufacturer elected to have the glider tested in. Not all manoeuvres are tested in each category and there is no way of knowing how close the glider was to failing in any particular manoeuvre or the whole category itself. The DHV test on the other hand gives a result by way of a mark for the glider after going through a standard series of tests for all gliders. The overall grade is the mark given for the worst result in a particular manoeuvre. Often manufacturers will make special DHV versions of gliders in order to get a better result.

The 'Basic Intermediates' are gliders with a DHV 1-2 (sometimes low DHV 2) and/or AFNOR 'Standard'. They are suited to pilots with a 'restricted' (novice) rating who have achieved a very good and confident solo standard on leaving their school, and for weekend 'fun' pilots who might fly a few times a month, logging up around 25 to 50 hours a year and may also have an intermediate rating. They are typically lower aspect ratio gliders at around 5.0 though



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Licence Courses and Additional Tuition:

Our small group, nine day live-in Licence Courses (\$1320 including accommodation) are unique in Australia. They include many hours thermalling and ridge soaring as well as important emergency manoeuvres. We do NOT sign off basic licenses - our novice courses go way beyond the minimum and include intermediate and advanced skills! We also offer personal one-on-one tuition in areas such as - novice license refresher, thermalling, cross country, basic acro, security clinics, and Intermediate, Advanced, Tandem, Motor and other ratings - all from Mt Borah, Manilla – near Tamworth, NSW.

"I only sell what I personally use and have rigorously tested over many years"



ADVANCE: Paragliders (Switzerland) since 1988 – the industry reference gliders in each class for quality, design, safety and performance - models Alpha, Epsilon, Sigma, Omega and Bi-Beta. Plus harnesses and accessories. Large stock of second hand gliders too.

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some are now tagged as "Hot 1-2's" if they are over that.

The 'Standard Intermediate' group accounts for the bulk of gliders in the mid range of DHV 2 and are usually identified by their lower aspect ratio relative to the hot DHV 2's, and AFNOR 'Standard or Performance' rating. They have most DHV scores around 1-2, perhaps up to two DHV 2 scores (thus the class) and display much more refined handling compared to the Basic ones. Quite often this glider will be marketed by its manufacturer as the "all round" intermediate or similar. They suit pilots that have been flying for a few years with 50 to 100 hours logged and 50 plus hours annually. They should have experience in a variety of areas and conditions, have good glider control and find the lower level gliders too docile and not sporty or challenging enough.

The 'Performance Intermediate' category will have DHV 2 (sometimes 2-3 accelerated) and usually AFNOR 'Performance'. They are known for their lively handling and higher aspect ratio (5.5+) and are **not** suited to an average Intermediate rated pilot. They are for pilots with at least an Intermediate or Advanced rating who fly actively in a variety of places, have probably done a safety course and can perform the critical fast descent manoeuvres easily. Most importantly, they are for pilots who fly regularly with annual airtime usually well over 50 hours on a 100 to 200 hour base. It is generally recognised as the top glider category for regular recreational pilots (ie, most keen sports oriented pilots would progress up to and remain at this level). These gliders provide near high performance, but with superior safety than high performance wings. Currently there are a few High Performance Class gliders that have slid into the top end DHV 2 rating and can be confused as being "Performance Intermediates". It is only the newer high aspect intermediates that display high performance handling characteristics that now form the top of the intermediate class.

The high performance grouping can be divided into 'High performance' and 'High Performance Comp/Proto'.

The former includes the DHV 2-3 and DHV 3 ratings and sometimes AFNOR 'Performance', but usually always AFNOR 'Competition'. It can also include some DHV 2 gliders which just achieved the DHV 2 rating but are in reality a high performance glider by virtue of their handling, aspect ratio and positioning in the manufacturers product line (as the high performance glider). Pilots in this class would fly regular cross-country, fly for performance, fly in all areas, take part in competitions, can control extreme flight manoeuvres and have well above average annual flying time (100 plus hours). If you are flying one and don't fit this description, think hard about your need to fly this type of glider.

The latter 'Comp/Proto' wings are distinguished by a lack of DHV (and in some cases AFNOR) certification, high aspect ratios, thin profiles and very twitchy in-flight behaviour. They are generally prototypes with microlines and can often be serialised versions of pure comp prototypes. They are for full time factory/test pilots who have vast experience, fly hundreds of hours every year, and take part in high level international comps. There are only a few dozen pilots in the world who can safely fly such gliders in all conditions. This type of glider is not normally available to the general flying public though they do sometimes appear on the second-hand market and should be avoided.

More detailed information on certification at:

DHV: [www.dhv.de] and AFNOR/Aerotests: [http://lappc-th4.in2p3.fr/aerotests/welcome.htm]



Godfrey Wenness is the CFI at Manilla Paragliding and has logged over 5000hrs. He is the Paragliding Rep on the HGFA Safety and Operations Committee, Australian Team Member, Prototype test pilot, and has held/holds multiple World and National Distance Records.



Weather or Not...

Rohan Holtkamp

DISCOVER THE FREEDOM CARVING THROUGH AND SOARING SMOOTH RIDGE LIFT OR CLIMBING TO COOL ALTITUDES IN THERMALS, HIGH ABOVE HUMANITY. ALL AND MORE YOU DREAMT IT COULD BE...

For good flying of course, especially if your car has good racks that carry more than a single glider!

All the clubs have contact numbers for their pilots, and will help you contact the more active and experienced pilots, so the best thing to do is to join your local club.

Being at the right place at the right time is not too difficult if your chosen flying area has sites that cater for all wind directions and strengths (and you have "the device" on board). Towing is the best way to allow for a variety of conditions and still get that airtime plus plenty of take off and landing practice. Sometimes this means more driving, but skills, airtime and enjoyment will snowball to exceed your wildest expectations!



*Rohan runs "Dynamic Flight" hang gliding school, holds several World records and is a successful comp pilot, seen here taking off at the '98 Canungra Classic
Photo: Max Wiener*

When learning, soaring airtime was so easy to get. The instructor chose the hill, you loaded up, got there and flew. A few flights here and there and airtime clocked up.

Now it doesn't seem that easy any more, even though you have a glider and all the gear. Does it ever seem to be on anymore? Drove how far for a sleddie? How many years will it take to get my intermediate?

Answers to questions like these can be found in accurate assessment of the weather. Wind strength, direction, air mass moisture content, pressure and density are all indicated by various visual signs, and take years to learn how to interpret accurately. If you want to know more intricate details about weather, the following books are recommended:

- "Meteorology for Glider Pilots" by C.E. Wallington, third international edition, published by John Murray, and
- "Understanding the Sky" by Dennis Pagen.

The easiest way to assess the weather is to have someone do it for you. A fisherman may be able to predict the weather accurately, but his main aim is to catch fish. A news/weatherman may be able to predict the weather, but he has to consider the city environment – not exactly where you are going to go flying. Obviously the best person to assess the weather for you is a more experienced pilot who happens to live in the area where you aim to go flying. My experience of instructing hang gliding year round for over 10 years has taught me that it is flyable nearly every day of the year, you just need to be at the right place at the right time.

The best way to ensure that you are at the right place at the right time is to plan and prepare. Don't forget to bring along "the device" that shows the way to launch, assesses the safety of the launch, helps with the hang check and also forecasts conditions with incredible accuracy. Which "device"? An experienced pilot. But why would an experienced pilot want to go to a novice/restricted rated site?

The IPPI Card

INTERNATIONAL PILOT PROFICIENCY IDENTIFICATION

Following the introduction of the IPPI card in 1992, national associations and pilots throughout the world have benefited from the internationally recognised standards of the IPPI card. CIVL would like all national hang gliding and paragliding associations to promote this card.

What are the benefits of the IPPI card?

- The IPPI card benefits everyone in the hang gliding and paragliding international community. From those who control flying sites to the pilots who wish to use flying sites.
- The IPPI card promotes flight safety and growth of the sport.
- The IPPI card provides a standard of reference by which all national pilot rating programmes can be compared.
- The use of this card, in conjunction with the pilot's national license card, allows clubs, managers, instructors, marshals and all other responsible persons/pilots at hang gliding and paragliding flying sites to verify the pilot experience level prior to giving permission to fly from the site.
- The IPPI card is an internationally recognised rating system which removes the differences and need for understanding the very wide variety of national rating systems.
- For pilots who fly outside of their known or local area it is a quick and easy method of providing proof of flying experience and proficiency.
- Local persons responsible for a site, know from the IPPI card the visiting pilot's ability level, suitability of the site and how much advice they may need to give, etc.



IPPI cards are available from the HGFA National Office on 02 6559 2713.

HOW TO FLY AND HAVE FUN

Rob Hibberd

HANG GLIDING HAS GONE THROUGH SOME TOUGH TIMES IN THE LAST FEW YEARS. THE SPORT THRIVED THROUGH THE 80'S AND COMPETITION WAS ONE OF THE MAIN DRIVING FORCES. COMPS ARE GREAT FOR IMPROVING ONE'S SKILLS, YOU GET TO FLY WITH OTHER PILOTS ON PRE-SET COURSES, YOU ARE GIVEN A 'GOAL' AND ACHIEVING THAT GOAL CAN GIVE THE PILOT IMMENSE SATISFACTION.

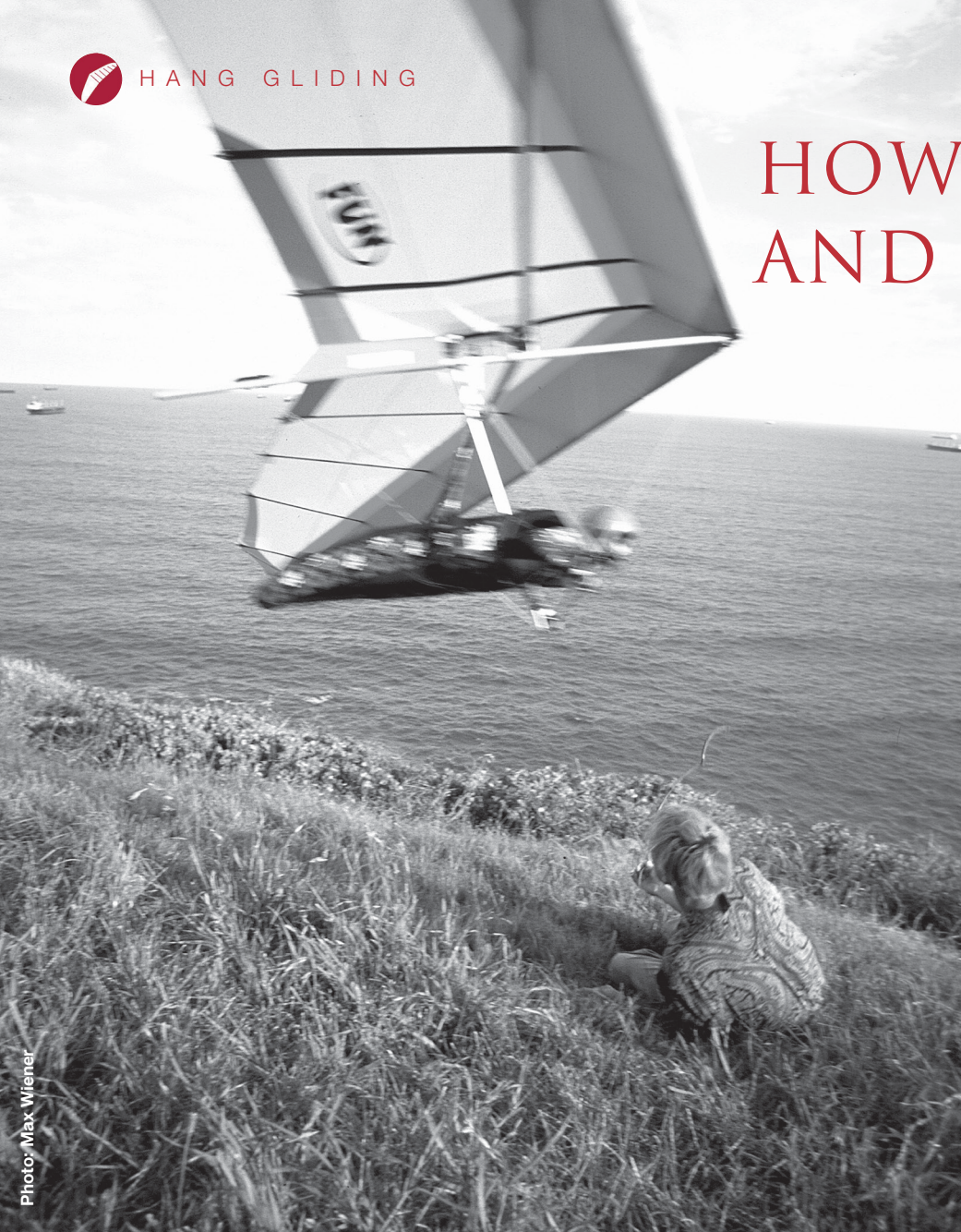


Photo: Max Wiener

Our desire for competing in those early days caused manufacturers to design safer and better performing gliders. This was all very positive for the sport and our design knowledge along with the availability of lighter exotic materials has seen our gliders improve dramatically in performance. During this race for the best performing glider both manufacturers and veterans of the sport lost sight of what is important to make the sport grow. The gap between novice pilots and competition pilots was too wide, the step too great. There was an undercurrent of peer pressure to get up and coming pilots into high performance gliders. This created a situation that still exists today where many pilots are flying gliders they cannot handle in the varying conditions we now like to fly in. Imagine being in the air and the whole time worrying about how you are going to land this S.O.B. Not smart!

So how do you fly and have fun at the same time. First of all make sure you are flying a glider you are confident in, that you can well and truly handle. If you take this course your flying skills will improve at a more efficient rate than your mate who has opted for a glider that is a little out of his or her league.

Manufacturers have realised that there is a market for pilots who may actually want to fly a certain class of glider and stay on that class. The popularity of these gliders has increased in recent years and it is now possible to buy a well finished glider with great handling characteristics that really does suit most pilot's needs.

Airborne build a glider called the Fun, Moyes build a similar performing glider called the Ventura. This new glider type that can take you from learning to fly on the dunes, to low slope or dune soaring, for the experienced (great fun!). The same glider performs excellently for thermal and cross-

country flying and, in fact, will climb better than any of the higher performance gliders on the market. Competition results are starting to show that pilots flying this recreational class of glider often get better results than pilots flying high performance gliders. Watching some pilots trying to top land their performance gliders at some coastal sites can be quite entertaining if not nerve wracking, and it is common to see pilots in their recreational class gliders having fun practicing landing after landing with ease. So consider this whilst making your choice of which glider to buy – the glider is only the tool to get you in the air. A high performance glider possibly looks more impressive on the ground, but you really need a glider that will allow you to hone your skills in the air, one that you can pull off perfect landings in all conditions and most of all, a glider you feel confident in.

Have Fun!



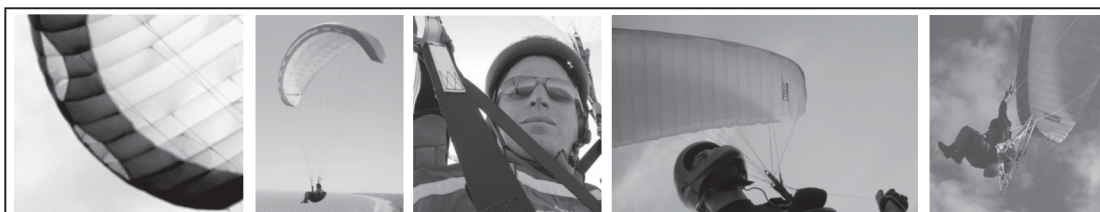
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GOING MOTORISED

Microlights and Nanolights

John Reynoldson

EVER SINCE THE BEGINNING OF HANG GLIDING, THERE HAVE BEEN PEOPLE WHO WANTED THE FREEDOM TO FLY THESE SIMPLE AND CONVENIENT MACHINES WITHOUT THE HASSLE OF HILL OR TOW LAUNCHING. SOME PILOTS SIMPLY WANTED TO LAUNCH UNDER POWER, TURN OFF AND SOAR. OTHERS WANTED TO MOTOR AROUND THE COUNTRYSIDE.

Many of these early attempts were not only marginally successful, but also darn dangerous! However, in the late 1970's the 'trike' or 'microlight' design we see today was developed and has since been refined to become a safe, stable flying machine with a good safety record, capable of comfortable long cross-country flights in fair weather conditions. Today's microlights cruise at about 100km/h, with a range of about 4 hours. The author has flown up to 450 miles in one day in one of these machines.

Another reason you might consider microlights is convenience. To be a successful cross-country hang glider pilot requires dedication and time. The logistics of organising launch, tow and retrieves can be daunting. You really need to dedicate your whole day to it, and that day could easily end prematurely as you wait in the bomb-out paddock after a 'sled ride'. Microlights, on the other hand, give the opportunity to fly when and where you want – at your convenience. You can go flying for the morning and be back in time for lunch on schedule, a boon for married pilots with families who are not quite so enthusiastic about flying. Microlights may have saved a few marriages!

On the other hand, purists sometimes scoff at the petrol heads. However, this scoffing evaporates like magic if the petrol head has a trike capable of being used as a hang glider tug!

standard. There are real 'powered hang gliders', but they're a different breed of animal which we'll discuss later!

LEARNING TO FLY A MICROLIGHT

In this magazine you will find a list of HGFA approved microlight schools. Your first move should be to contact one that's convenient to you and arrange a 'Trial Introductory Flight'. This will usually be a flight of about 1/2 hour duration, plus a quick pre-briefing on what to expect. The instructor will take off, perform most of the basic handling manoeuvres, then, at a safe altitude, pass you the controls to try them yourself under his supervision. Many instructors often cap the flight with an engine-off landing (depending on the conditions and the airfield requirements) as a demonstration of the safety of the aircraft in case of engine failure.

Assuming you've enjoyed the experience, it's now time to sign up for lessons.

Most pilots will take between 10-20 hours of in-flight instruction to solo. This will include instruction in the usual in-flight manoeuvres – straight and level flight, climb, descent, turns, steep turns and stalls. However, as with most aircraft training, you will spend a lot of time doing circuits – going around the airfield for plenty of take off and landing practice. Before every flying session you will be briefed on the manoeuvres to be done and any theory required, and usually there will be a debriefing as well. You should allow an extra hour for every hour spent in the aircraft.

Before being granted your pilot certificate, you will need to pass an examination on basic aeronautical knowledge and air legislation/rules.

Of course this is by no means the end of your learning experience. You will probably need a radio operators endorsement so that you can operate at many airfields, a two-seat endorsement to allow you to take passengers and a cross-country endorsement to allow operations more than 50km from the airfield.

It may seem a lot of work, but in the end it will all be worth it, to know that you can safely fly, navigate and judge the conditions – with the freedom to take your aircraft almost anywhere.

CONVERSION

Experienced hang glider pilots usually find the in-flight control of a trike quite simple and become comfortable with it within minutes. Most of their time will be spent practicing procedures, take offs and landings. Hang glider pilots do tend to forget they have an engine on landing and may have a tendency to forget they can 'go-around' if the landing isn't shaping up well. Nevertheless, hang glider pilots will normally achieve solo very quickly.



Photo: John Reynoldson

John works a thermal over Milbrulong in his nanolight

ARE MICROLIGHTS 'POWERED HANG GLIDERS'?

The microlights of today are not 'powered hang gliders'. The wings have been designed specifically for their application and are too heavy and fast to be used as hang gliders. They are certified to a different

Experienced General Aviation (3-axis) pilots can present some problems. After the initial shock of the unconventional flight controls, they usually adapt well to the flying, but may have some problems in the landing phase. In some (not all) cases, the GA pilot may pull in instead of pushing out on the flare in an emergency. In addition, since the ground steering is 'billy cart' style rather than conventional aircraft, they may steer the wrong way for a second on landing. Both these responses may result in a crash, so prospective students with GA backgrounds should understand if their instructor takes some time to be assured that this tendency is abolished prior to first solo!

POWER ASSISTED SOARING (NANOLIGHTS)

Many of the first microlights were built with self-launched soaring in mind. For various reasons, including the popularity of towing and commercial pressures toward heavy two-seat microlights, this has remained a slow growth area.

However, anyone interested in this realm of flight now has quite a few choices. As well as the venerable Minimum system from Germany, the Mosquito Motor harness and its Australian equivalent, the Explorer offer pilots the capability of strapping on an auxiliary motor package which allows them to self launch, switch off and fly prone in their normal hang glider.

There are also several nanolight trikes available from Italian and French manufacturers which are designed to be used with unmodi-



Photo: Gerry Charlesbois

The Mosquito in flight

fied hang gliders. To fly a self launched 'nanolight', you will require a 'motorised hang gliding' endorsement from the HGFA in addition to your normal hang glider rating.



Further reading:

If you are interested in reading more about the history of trikes and the technical aspects of trike flight, you might like to take a look at the Aerial Pursuits Trike web pages at: [www.ozemail.com.au/~aerial/stuff.htm].

PARAMOTORING – An Overview

Andrew Polidano

AFTER YOU HAVE REACHED A PROFICIENT LEVEL OF PARAGLIDING NEW AND EXCITING VENTURES OPEN UP. ONE OF WHICH IS PARAMOTORING.

Nowadays motors from 80cc to 312cc are being used in paramotors. Paramotors can be flown from flat ground to heights of up to 10,000ft in Australia. The HGFA currently allows paramotor endorsements to be given to people with 20 hours logged paragliding experience along with the relevant course. Para-triking is also becoming popular however the HGFA is still developing a module for this type of flying.

Most of the time a conventional paraglider can be used for paramotoring without increasing the size of the glider.

The German association for free flying and glider certification is called the DHV, however their paramotoring certification body is the DULV (UL being ultralight). Not all wings on the market have this certification. Equipment selection is important. Some wings tend to roll and oscillate under power.

There are several variations of motors on the market. High and low attachment point motors vary in their ability to weightshift while motoring. Some motors are more powerful than others. Approximately 45kg of thrust is needed for the average 75kg person. It is very typical to use power to gain altitude and then motor off to use thermal currents or ridge lift.

There are many brands being imported into Australia as well as one Australian manufacturer. Once a year there is a Picolight Fly-in which is dominated by paramotor pilots from around Australia. It is held in a little town called Milbrulong, not far from Wagga Wagga. At this event many pilots from Australia and beyond form



Photo: Colin Page

Groundhandling

a forum for flying and testing equipment. As in most other countries there is a push for people to be able to take up paramotoring training before completing the paragliding course. Until then the similar groundhandling skills are always very important for successful launching of paramotors.



More information and stories can be found at www.policlide.com



MY FIRST MOUNTAIN FLIGHT

Al Giles

I DROVE DOWN TO MT BUFFALO AS A BRAND NEW HANG 4 PILOT – THAT’S ADVANCED IN TODAY’S SCHEME OF THINGS – COURTESY OF A LATE NIGHT SESSION WITH A CARTON AND A COUPLE OF INSTRUCTORS WHO COULD SIGN OFF HANG 4’S. ‘WHAT ARE THE EFFECTS OF ROTOR ON A HANG GLIDER? WHERE WOULD YOU FIND IT? HOW DO YOU TELL WIND STRENGTH AND DIRECTION ON TOP OF A MOUNTAIN?’ ‘WELL THAT WOULD BE OBVIOUS, WOULDN’T IT?...’ NO-ONE ELSE FROM MY COASTAL CLUB COULD BE PERSUADED TO GO TO THE LEGENDARY MOUNTAIN, SO IT WAS A SOLO TRIP.

Approaching Buffalo I could see there was a cumulus cloud over the top. Great, that meant it was on! All I knew about inland flying was that if there was a cumulus cloud over the hill, there must be thermals going up to it. Unlike the coast, you didn’t need the wind blowing onto the hill from the direction you took off from, you just had to wait for a thermal to come up the face and then launch, didn’t you? I wasn’t all that sure what a thermal was but I knew they had up-cycles to launch and fly in and down-cycles to avoid. I had a brand new set of instruments to tell me which way was up, so how hard could that be?

I found the launch by following some tourists rubbernecking at the sign saying “Pilots only past this point”. Ha, I was a pilot, entitled to go beyond ordinary mortals, a prince among men! Curious that there were no other princes there on this pleasant summer’s day. Well, never mind, what a view: a granite rock curving over a 3,000ft drop to the valley floor. The ribbons were flicking up and down, back and forth in a way I’d never seen before. This must be thermal lift, with up and down cycles. Hmm, I’d got the impression the cycles lasted minutes rather than seconds. Ah well, lots to learn today I was to become a thermal pilot! No more hovering over miserable little headlands by the sea, I was going cross-country, off to seek my fortune and see the world!



More dumb tourists gathered as I set up my glider and harness. I called one down for a hang check, then sent him back to the crowd behind the sign before I picked up the glider. I’d heard about tourist ‘wire men’ wrecking a launch by letting go too soon or too late. No-one was going to wreck my launch, I knew what I was doing. The kite had a curiously uncertain feel about it as I stood waiting for the ribbons to flick up. This must be part of inland launching, I thought, but if I’d had the option, I would have preferred the solid feel of a seabreeze on the nose.

Wings level, nose down, ribbons up, run hard! Four good steps and I was off the rock and the bottom fell out of the world. The glider was flicking every which way as the ribbons had been, the world was racing upwards past me in a blur, the wind roared and rushed, my instruments were screaming in fearful freefall, I was being banged against every bit of the kite the harness could reach and the sky and ground rotated rapidly round each other in a blur of green and blue. The kite did not appear to be flying at all, just falling like an autumn leaf – but why? I wasn’t stalled and it had flown beautifully on the coast the day before.

Three minutes later I was standing in the bomb-out paddock, where you land if you don’t get up and away, holding the glider steady at last. My knuckles, I noticed, were white. I bet my face was too. 3,000ft in three minutes. This bomb-out paddock was called “the Burrs” and I had just discovered why. Slowly I packed up the glider and harness and carried them over to the road nearby. Leaving them there, I walked across to the mountain stream beyond, took off my burry shoes and socks and sat on a rock with my feet in the water and my head in my hands.

I was pretty miserable. I had really wanted to be a thermal pilot, ‘If this is what it’s like,’ I thought, ‘I don’t think that I can do it.’ A tourist had driven my car back down the hill at my request. I thanked him and took my glider and myself off to a caravan park to check in. Here in the valley, I noticed as I swam in the river, it was actually quite windy.

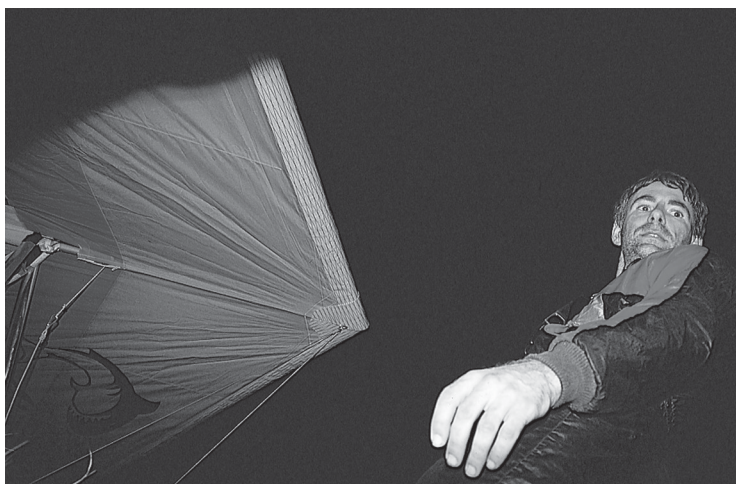
That night I spotted some others in the local pub wearing hang gliding T-shirts, and went over to introduce myself. They were experienced inland pilots and a bit glum about not being able to fly that day. I said, “*Why didn’t you fly? I had a flight.*” “*From where?*”, they wanted to know. “*From Buffalo.*” “*You’ve got to be crazy!*”, they said, “*Why, the wind would have to have been 20 knots over the back today!*” “*What’s over the back...?*”, I started to say – and then it suddenly all made sense.

**REMEMBER:**

DON'T LAUNCH IN ROTOR,
CHECK THE GENERAL WIND
DIRECTION BEFORE CHOOSING
YOUR TAKE-OFF SITE.

DON'T FLY ALONE – EVER!

DON'T ATTEMPT A NEW TYPE
OF FLYING (COASTAL, INLAND
OR TOWING) WITHOUT
ON-SITE SUPERVISION.



Al still loves his XC flying. Here he's getting up for a moonlight start to try and catch the Morning Glory, a weather phenomenon in the Gulf of Carpentaria, at the northern end of Australia, that allows extensive cross-country wave flights.

I had taken off on the downwind side of the mountain and what I had seen in the ribbons had been rotor. Idiot that I was, I had never checked the prevailing wind direction, just assumed that the Cumulus over the top meant it was 'on'... and I thought the tourists were stupid! I don't think I have ever been so dumbstruck at any news in a pub. Then another thought hit me, *"You mean thermalling isn't always like that?"*

Two days later, in their company, I had my first proper mountain flight. I took off from a hill near Buffalo (which still wasn't 'on') and heard the sound of my vario singing to me as I circled higher and higher, watching the horizon widen as the world fell away, the air

grew cool and my altimeter wound up to 7,000ft until white wisps of cloud were suddenly wreathing the wings. I set off up the valley for a cross-country flight. It was only 15km, a two-thermal flight – but the joy of being able to go anywhere I pleased! The delight of selecting a landing paddock at last, of setting down by a farm house and saying to the farmer, "I've just landed my hang glider here, do you mind if I use your phone? No, a HANG glider. Come and have a look..."



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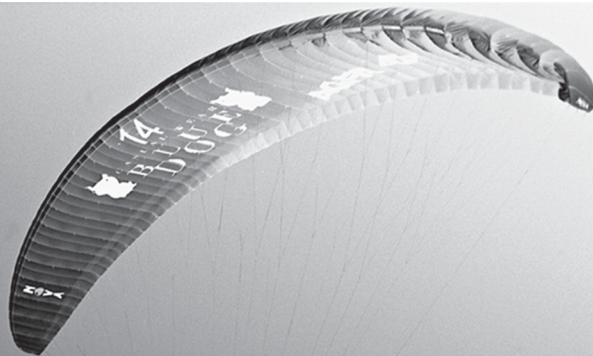
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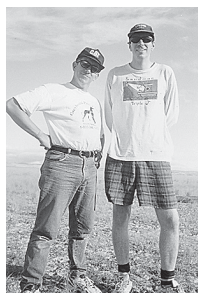
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THE '98 CANUNGRA CLASSIC

– From two Newbies



WE BOTH HAD ABOUT 14 MONTHS FLYING EXPERIENCE WHEN WE COMPETED IN THE 98 CLASSIC – OUR FIRST EVER COMPETITION.

MANY RECENT ARTICLES AND OPINIONS HAVE BEEN TRYING TO OPEN UP COMPETITIONS TO PILOTS OF ALL STANDARDS AND EXPERIENCE WHICH LED US TO ENTER OUR THOUGHTS AND EXPERIENCE AS FOLLOWS.

Craig Hopkins:

One stand-out feature of my first competition was the friendliness and camaraderie of organisers and fellow competitors. At no time was I made to feel like one who was 'making up the numbers'. There is a lot to be said for the time shared with fellow flyers who have competed in the same air over the same course. No matter how you compared in reality. The conditions on some days were better than others and I often shared the bomb-out paddock with pilots better than me, but it was clearly no coincidence that the high ranked pilots got away every day.

Experience and skill are such abstract things that they are impossible to measure, but you can tell when they're increasing. Classic is definitely not a beginner's competition. I don't mean that beginners should not enter and cannot benefit and have a great time – I did and you will. I do mean that I was not fully prepared for what I was to experience over the course of the competition. My thermalling skills could have used at least another year of flying to provide enough confidence of staying in a thermal before I was going to attempt to cross those formidable looking ridges.

Dennis Pagen says that the three things a new competition pilot should strive for are to get away from launch, to reach goal and then to get to goal faster. I achieved the first one on the first day of competition! This turned out to be the high point of my flying.

From what I could see, the use of GPS for the competition was a great success. This must be due to the efforts and skill of Tim Cummings. I had heaps of fun sitting on launch selecting way points and routes after the day's task was announced. No cameras or film to worry about, just switch on the GPS before taking off and hand it to Tim for a data dump – only got to do that once.

Getting organised with a dedicated driver is a must! We formed a 'team' once

the comp began and had a driver volunteer for four of the days, but on several days we were lucky that I bombed out and could go pick up the others. Even for newbies, the worry of retrieval is not something you need.

John Wilson:

Wow, this is something different: You get to the launch site and people are organised, already set up in a designated location and ready to go – no mucking around, waiting for someone else to go first to see what conditions are like. Then you are given a course to fly and a designated launch order – another first.

Day 0: Drive to Canungra. Peter Garonne, one of the other pilots in our group, rings to say he has hurt his knee and is pulling out of the comp – not a good start. After arriving and registering there is a BBQ and calcutta. I buy Craig's team for \$30 but he won't reciprocate.

Day 1: An early start for new pilots with a briefing about comps and launch procedures. There is a demonstration for pilots going to use GPS's instead of cameras. This is followed by the main briefing which starts by reviewing the GPS talk for people that hadn't read Tim's article in Skysailor. Due to strong winds the day is called off.

Day 2: Launch is from Mt Tambourine with a headwind task to Rathdowney (Hang on, I've never had to fly headwind before...). I launch and join a small gaggle to get to 6,500ft for a great view of the Gold Coast, then head for Mt Misery. I make it across the gap to the next ridge but then land with a group of pilots – a great first day.

Day 3: Another launch from Mt Tambourine, stronger headwind today and less lift. I leave the hill, but can only make it to the training hill.

Day 4: About a dozen pilots launch from Mt Tambourine before the seabreeze comes in. After some discussion the day is

cancelled as too few pilots had an opportunity to launch.

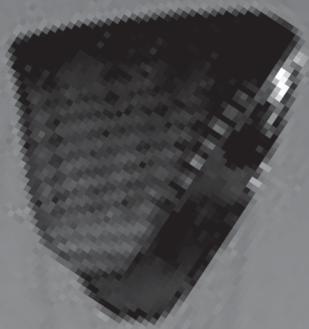
Day 5: Approaching storms force the day to be abandoned. A good thing, as Brisbane is lashed by fierce storms, damaging houses.

Day 6: Strong westerly winds mean another launch from Tambourine. Plenty of lift today, but I can only get halfway across the valley before I lose too much height. By the time I have found a thermal and got back to a good height, I am being blown over the back. I follow the ridge south until I arrive at Canungra town and a dead end and finish up landing at Moriarty Hall, competition HQ, the smallest landing field I have ever had to use. Worst thing is that after a 70 minute flight the distance still only counts as bomb-out points.

Day 7: Easterly winds mean a change in launch: Beechmont. I get to see about 40 pilots all ridge soaring the same piece of hill, it looks too busy for me and I wait until a few pilots get away and there is a bit of space before launching. After a few false starts I get a good thermal and go over the back and over the tiger country. The first valley is the worst, after that there are some landing sites. After clearing the second valley I head out to Beaudesert where I experience convergence for the first time. Unfortunately, I don't know I am in it until after I land and talk to some of the other pilots.

Day 8: Light easterly wind and another launch site for the log book. Flying Fox sees nearly half the field bomb out, only the guns seem to know when to launch and get over the back.

All in all a great learning experience. It forced me to try things I would not have tried at home, going headwind and going over the back. Entering a competition was a great way to improve my flying skills and with so many people watching your launches and landings you just don't want to stuff up.



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FINAL SOLUTION

A Guide to Stress-free Landings

Warwick Duncan

WE'VE ALL SEEN THEM. THOSE PILOTS THAT MAKE LANDING LOOK REALLY EASY. IT DOESN'T MATTER WHAT THE SIZE, SHAPE OR OBSTRUCTIONS OF THE Paddock MAY BE, THEY ALWAYS COME IN CALM, COOL AND COLLECTED. NO HIGH BANKED TURNS, NO LAST MINUTE CORRECTIONS. SO MUCH TIME TO DO EVERYTHING. THEY ALWAYS END UP WITH A NICE LONG FINAL WITH LOTS OF EXTRA SPEED FOR CUTTING THROUGH TURBULENCE OR (FOR THE SHOW-OFFS) THRILLING THE CROWD WITH A WHISTLING GROUND EFFECT APPROACH.

Then there's the rest of us. Don't get me wrong, sometimes it all comes together for us too when we're at the right place and time and come zooming in like the guns... sometimes. But we've all been in the bomb out paddock watching someone completely botch their landing approach, too high and too far up the paddock, doing ever more desperate S-turns and fast running out of options. Everyone on the ground goes quiet, wondering where this poor soul will end up and hoping it's not the powerlines.

Wouldn't it be great to have a versatile and foolproof landing system that can be applied to any situation and works every time? A system that puts you in the right place at the right time every time, ready for that long, fast final? It's called the Aircraft Approach.

"Is that all?" I hear you say, but unless you are one of the "landing guns" (in which case you already use it, even if you aren't

aware of it), then maybe you should have a fresh look at this approach and learn how to develop it into a reliable landing system, a template that can be applied anywhere. If you say *"I don't need to learn this because I fly down the coast,"* I would argue the point that the last section of an S-turn approach is an aircraft approach with a long base and a very short final. So if you move inland from the coast or vice versa it's just a matter of adjusting the system to fit. Versatility is the key.

Humans are pretty lousy at judging distances. Our binocular vision only works up to a distance of about 50m – beyond that it's just guesswork as things get smaller. Fortunately it turns out that human eyes and brains are excellent at judging angles. So let's look at a system that allows you to land using angles, that can be repeated over and over until it's second nature, that requires no

turns beyond 90° and allows you to always turn in towards your landing point so you never lose sight of it. Best of all it's logical and predictable so everyone on the ground and in the air knows exactly where you're headed.

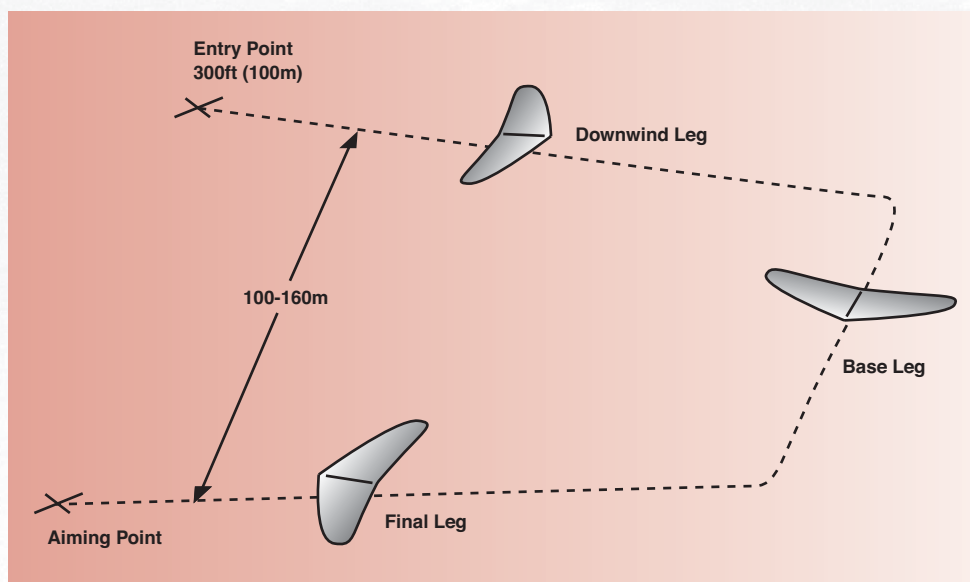
Of course, if you're already flying hang gliders then you must be landing, right? You already use a system of sorts (even boating about aimlessly is a system, I guess) and it may be necessary to move outside your comfort zone in order to learn something new. I recommend the following should be practised at a large and unobstructed landing site. Once you're familiar with it, you can take it away and apply it anywhere. Believe me, it will be worth the effort.

Here is a step by step lesson on how to develop your very own landing system.

1. PRE-PLANNING

Stop off at your landing paddock and have a look around. Of course, if you're towing, you're already there. Look out for obstructions as you normally would, but look at it with an aircraft approach with its downwind, base and final legs in mind and decide whether a right or left hand approach might be more appropriate. There's almost always a preferred direction to approach any given paddock. Choose the direction that brings you over the lowest obstructions and, if the wind is crossed, that will give you a base leg that's slightly headwind rather than slightly tail. This last point ensures that things tend to happen more slowly. A compromise between these two factors may have to be reached. Next, grab your altimeter and zero it.

This pre-planning can be done from the air as you become more familiar with the technique and checking out your landing paddock from the ground will not always be possible.



The Aircraft Approach



2. PREPARATION (ABOVE 800FT)

By whichever method takes your fancy, take off and fly over your landing paddock. Preferably for your first attempt I would recommend between 800-1,500ft. Find a spot on the ground that you are going to try and nail as your landing spot. Make it something you'll be able to see for your entire approach. This is your "aiming point".

Now find a point about 100-150m from the aiming point in a direction at right angles to the wind (See diagram). Picture a point 300ft above this. This imaginary point, floating 300ft in the air and offset 100-150m from the aiming point is called the "entry point" which is where you must enter your approach.

Next, as you float serenely over the paddock, still with plenty of altitude, trace out a downwind, base and final leg on the ground starting at your entry point and ending at your aiming point. You won't necessarily follow this track exactly, but it will give you an idea of whether you will have to shorten or lengthen any particular legs to avoid obstructions or whether a left hand approach may be more appropriate than a right hand one. If this is the case, place your entry point out the other side and go through the process again.

This may seem like a lot to do, but in practice it will only take you a matter of seconds. Also, the more planning you do up high, the less you have to do down low where things start to happen much faster. This is why the guns are so relaxed coming in – they've already done most of the work!

3. HEADING FOR THE ENTRY POINT (800-300FT)

The next bit takes discipline. That's because there are any number of things you can do once you've worked out your approach and you fly through the entry point. If winds are light, sometimes it feels right to do nice lazy 360's over your entry point until you are down to 300ft. If winds are stronger you may find it easier to "park" over it into wind as you slowly come down. Whatever feels appropriate. What takes the discipline is that you must end up at your entry point at the correct altitude. Enjoy the view, keep an eye on the wind direction, but don't become too distracted, because if you end up at 300ft in completely the wrong place, everything will fall in a heap.

For this first flight use your zeroed altimeter to judge 300ft above the landing paddock (all heights in this article are with respect to the landing area). I certainly don't recommend people to always start their approaches purely on what their altimeter says, but for this initial flight use it to get an idea of what 300ft "looks like". During

future flights use the altimeter less and less and your judgement more and more.

4. ENTERING THE APPROACH (BELOW 300FT)

Approach your entry point heading downwind and as you fly through it, pull on some speed. You are now on your landing approach and you should consciously "switch on" and concentrate. Maintain this excess speed all the way until you are in ground effect.

As you begin your downwind leg, look at your aiming point. This is important and a better way of describing it would be to "fixate" on the aiming point. If you look right at the aiming point and keep looking at it as you fly along your approach, you'll find that the world moves with respect to it and you can begin to judge your glide. In this situation your brain is seeing angles that are changing in a very dynamic manner due to your motion and this will give you the cues for when to turn on to base and again on to final. This is why the approach starts offset from the target. If your entry point was directly over it, you'd be looking straight down on the target and there would initially be no angles, so your brain would have nothing to calculate with. Once you'd fly away from the target angles are created again, but this method would be definitely more difficult than starting offset.

In theory you would stare at the spot, like an eagle diving for a rabbit, all the way in and never divert your attention for a second. In practice this is not a good idea since there is a chance you might fly straight into something while looking at your target! When you created your landing template up high you should have got an idea at which points in your approach you'd have to watch out for obstacles. Glance ahead at intervals to make sure the way is clear, but make the effort to fixate back on the target. This is the key to really accurate spot landings. Concentration and discipline.

The visual cues you're getting from looking at the aiming point will tell you when to turn from downwind to base leg. If you appear to be sinking out with respect to your aiming point, then cut the corner. If you're too high, then extend the leg or, if you are comfortable doing so, add a little bit of sideslip to the turn (if you're unfamiliar with sideslipping then practice it higher up).

In a worst case scenario a thermal may break off giving you lift right along your base leg. In this situation you may have to continue right along past where you would normally make your final turn and then double back. You would then be shifting into more of an S-turn approach with all its inherent drawbacks (greater than 90° turns,

IN A NUTSHELL

ABOVE 800FT

1. Pick aiming point
2. Apply template to fit
3. Choose entry point

800-300FT

1. Bleed off height
2. Keep an eye on the wind direction
3. Pass through entry point

BELOW 300FT

1. Pull on speed and start approach
2. Fixate on aiming point
3. Adjust approach legs as required, sideslip carefully if necessary
4. Nail the spot!

a tendency to "creep" up the paddock), but the key is to have options and this system provides them in abundance. Remember, this is a worst case situation. What we really want is an approach with only two 90 degree turns.

So you're ready to turn from base to final. As with the previous turn you will see from the changing angles whether you're under or overshooting. Again, either cut in or extend the turn to line up the spot. Sideslipping on this turn should be done with extreme caution as you're now quite close to the ground.

Since you have been carrying extra speed right around the approach and judging the angles with it, you should be all lined up for a nice safe final approach. If you want, you can start the last turn slightly higher and come in with even more speed. Whatever you feel is appropriate, given the conditions and who's watching!

This places you on final, fast, straight and lined up on the aiming point and into wind. It is also where this discussion ends as the mechanics of the landing itself are beyond the scope of this article.

THE PORTABLE TEMPLATE

The next thing to do is practice, preferably at the same site and on the same day. Try for consistency and let those angles sink into your head until they look familiar. Wean yourself off the altimeter as soon as possible. Try right and left hand approaches. You should become just as comfortable with both, but remember that there's almost always a best way to come in. This consolidation is very important.

Finally, take away your mental template to a new site. Beware the trap of flying only one site and believing you are using a transportable landing system when you're really just landing on visual cues specific to that site. At a new site, repeat your preparation at altitude (Step 2). Trace out various approach-



es on the ground until you find the one that will work best. Bleed off your height to 300ft, then come in using those familiar angles. In fact, it's amazing how familiar an unfamiliar landing paddock can be when you have a system.

VARIATIONS AND PROBLEMS

Landing down the coast requires some variation. You may have to fly out of the lift band in order to bleed off height (probably over the water). Once you pass the entry point you will most likely fly a long base leg with a short final into the wind. You may find that a downwind leg is not even required. 300ft may not be an appropriate starting altitude if it is a small site and conditions are smooth. In this situation, consider a lower entry point.

Towing can also fool people new to the game. Quite often you have to set up right near the rear fence. Again, in this situation, it's much easier to have a long base leg over the rear fence, then a short final into wind.

Also, in the flatlands you can often land anywhere – so you do! Discipline yourself. Make every landing a spot landing. Find a feature in the paddock and use it as your aiming point and every landing you do will improve your technique. It may even cheer you up, bombing out knowing that at least you nailed that weed you were aiming for!

However much you distort and change your template to suit the coast, towing, the mountains – it will still work. Every time you land you'll build on what has gone before. After a season of consolidation you can even start to tighten your approach a bit with a lower entry point and a smaller approach (note that the angles will remain the same, but things will happen faster and there's less room for error as the ground gets in the way. Also, higher bank angles mean the lower wing may obscure the aiming point in turns). This can be fun to practice in winter or in other very mellow conditions. In rough air, though, 300ft is plenty low enough no matter how experienced you are.

At least 50% of the bad landings I've seen were caused by bad approaches. So if you have poor landing approach skills and you develop a system that works, expect at least a 50% improvement in the landings themselves. Surely this is motivation enough! So there you are: Warwick's guide to the Aircraft Approach. I don't claim to have invented it and no copyright applies to this technique. You can't be sued for using it. Safe landings for all!



Fear and Flying

Dr James Freeman

NEARLY EVERY PILOT WILL EXPERIENCE SOME DEGREE OF FEAR DURING THEIR FLYING CAREER. HOW WE EACH DEAL WITH IT CAN MAKE THE DIFFERENCE BETWEEN REAPING MAXIMUM ENJOYMENT FROM OUR CHOSEN SPORT OR PERHAPS EVEN CHOOSING TO ABANDON OUR DREAMS OF FREE FLIGHT.

Fear is a perfectly normal human reaction but if you think it is simply an emotion you are wrong. Fear is really the combination of the emotion anxiety combined with the biological stress response. Now for some background that will help us understand the underlying processes better.

The stress response is a well described physiological process and provides the key to understanding fear. It directly involves the brain, nervous system and the body's chemical messenger system. Okay, so we trigger a stress response – what happens then? Through a complex series of pathways the stress response causes the release of numerous messenger chemicals including: endorphins, cortisol, aldosterone and adrenaline.

So what does this chemical soup do to our bodies. The endorphins are natural opioids which act like heroin to relieve pain and induce a euphoric state. Cortisol speeds up the body's metabolism and causes the release of sugar into the blood. Aldosterone stimulates the kidneys to retain sodium which increases circulating blood volume. Adrenaline potentiates all the above effects, increases blood pressure and cardiac output so the heart pumps more blood, causes blood to be directed preferentially to the heart and muscles and away from the gastrointestinal system (this lack of blood is what causes those "butterflies" in your stomach), causes increased sweating, and also increases the excitability of the entire nervous system.

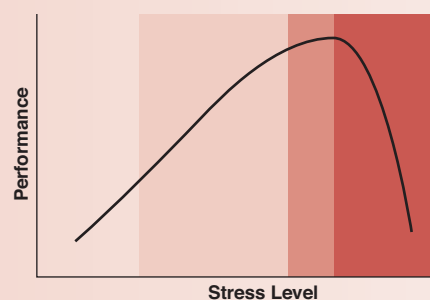
So now perhaps you can see why the stress response is also called the fight or flight (an English word which means in this context: to run away) response. The entire response has been carefully tuned by nature to help your survival when

threatened. It stimulates your brain and nervous system, increases the amount of blood pumped by your heart and directs it to where it is most required, provides the muscles and brain with extra fuel, increases blood volume in case you bleed, provides pain relief in case it hurts, and even provides extra sweaty grip on the palms of your hands and soles of your feet.

That rush you may feel before take off or landing is simply part of your stress response as your body prepares for the upcoming challenge. Research conducted by the US Airforce and others has found that increasing stress levels actually improves pilot performance up until a certain point. This is shown on the graph. If stress levels rise above this point then performance drops off dramatically (dark grey zone).

It follows that there is an optimum stress level. The problem with trying to operate too close to this level (light grey zone) is that there is little ability to cope with extra stresses. Our aim should be to regulate our stress level so that performance is enhanced (medium grey zone) without approaching the danger levels where stress can short circuit your ability to perform and potentially lead to pilot errors and perhaps an accident.

We are now in a position to understand that what we call fear actually represents a complex interplay between mind





and body. Unfortunately the system does not always work as designed. A threat may be real but is often only imaginary. It is received through one of our many sensory pathways. A lot of signal processing is done by the brain. Sometimes the information never makes it to the conscious level. Sometimes messages get garbled. Just as anxiety can cause a stress response so the converse is also true – a stress response can trigger anxiety. Sometimes the whole system gets overloaded and crashes.

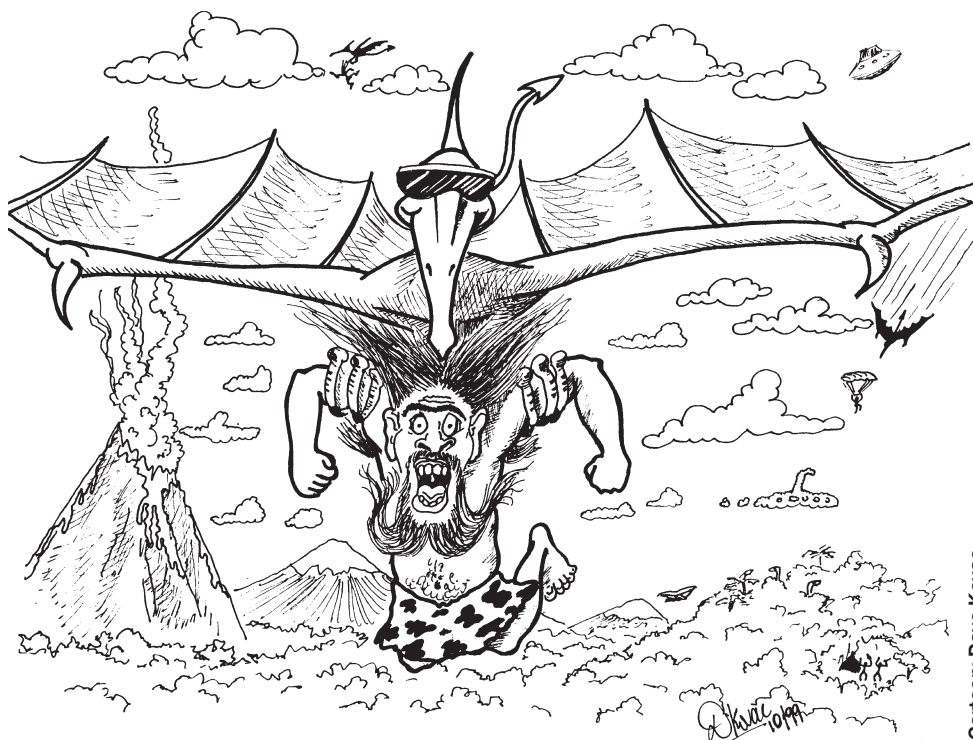
So how does a basic understanding of this help us to deal with fear. By now you should understand some of the processes involved in generating fear, its potential performance benefits and risks. We can now look at some practical ways to keep our fear at an acceptable level. This level is different for every individual.

We now know that the stress response, although designed to work for us, can lead to problems if it gets too strong. Triggers of the stress response include: hypoglycaemia (low blood sugar from not eating, or eating very sweet foods), caffeine, nicotine, hangovers, fatigue, sleep disturbance, infection, injury, heat, and dehydration. These are all potentially avoidable if required. Their effects are additive. Getting a good night's sleep, eating a good solid breakfast, and drinking plenty of fluid will all help pre-flight nerves. One or two cups of coffee in the morning will do little harm. I'm sure you've all heard enough about the evils of tobacco and alcohol so all I'll say is one word: moderation.

Triggers for anxiety side of the equation are many and varied. The non-flying related ones include money troubles, family troubles and job problems. These are outside the scope of this article but can be dealt with by compartmentalisation – put them away before you go flying. If you can't put them away consider not flying until you can. Fortunately flying related triggers for anxiety are easier to control.

A major issue is flight skills and currency. After a long lay-off you will not be as well in tune with your glider as you were when last flying regularly. Make it easy on yourself by choosing mellow conditions for your first flight after a long lay-off. If you are unhappy with basic skills such as launch and landing then consider going back to the training hill, with or without an instructor, to hone your technique. Currency and top notch flight skills are great confidence boosters.

Another issue is your glider – many of us are seduced by new ever higher performance ships. Unfortunately as well as their higher



Cartoon: Dave Kovac

THIS WAS NOT EXACTLY HOW UGG IMAGINED HIS FIRST FLIGHT!

performance they also usually offer more challenging flight characteristics. Can you really fly your glider? Are you comfortable with its safety characteristics? Do you actually enjoy flying it? Do you really need, and will you use, the extra point of glide or four kilometres per hour higher top speed?

LEARN TO WALK BEFORE YOU TRY TO RUN.

Enjoy each progressive stage of your flying development for the unique pleasures it can offer. The sky is like the ocean – it can be easy to get yourself in over your neck.

Follow the old axiom of only changing one thing at a time: glider, site, conditions, harness. This helps you concentrate your focus on flying.

HAVE A FLIGHT PLAN.

In fact have several. Learn to plan ahead so you know what to do in any given situation before it happens. Be pro-active, not reactive. After all you are flying the glider, it isn't flying you.

Always listen to the little alarm bell in the back of your mind – it could be your subconscious trying to tell you something.

EXAMINE THE CAUSE OF YOUR ANXIETY.

Define exactly what's worrying you. If the problem is real then act to fix it. If not be reassured that sometimes the wires do get crossed. As a fellow instructor once said "If you're not nervous at take off then you're taking

too many drugs!" Remember take offs are optional but once you do elect to launch use total commitment and focus as anything less is asking for trouble.

How lucky we are to be the few human beings among billions privileged with the amazing gift of free flight. So many people dream of flight, perhaps the ultimate symbol of freedom, and yet so few actually fly. We live in an age when for the first time in human history technology allows man to carry a wing to the top of a mountain, run with that wing and soar to the clouds. I can fly... what a truly amazing statement!

I ask myself why everyone in the world isn't flying. Why are they satisfied living their days on the ground, watching birds and only dreaming of the freedom of flight when it is available to those who make the effort? Perhaps the primary answer is fear.

Learn to master your fear, use the heightened performance and sensations it brings to your benefit, and the golden dream of free flight need never tarnish. In fact, it will become more rewarding than ever. For in the end everyone who lives, dies; yet not everyone who dies, has lived.

NO FEAR SLOGAN:

**WE TAKE THESE RISKS,
NOT TO ESCAPE LIFE,
BUT TO PREVENT LIFE
FROM ESCAPING US!**





RULES OF THE AIR

Craig Worth

PLEASE REFER TO THE DIAGRAMS ON THE RULES OF THE AIR, YOU WILL NEED TO LEARN THESE RULES THROUGH YOUR TRAINING TO ENABLE YOU TO FLY SAFELY WITH OTHER AIRCRAFT. THE MOST IMPORTANT RULE IS: "IT IS THE RESPONSIBILITY OF ALL PILOTS AT ALL TIMES TO AVOID A COLLISION".

To fly defensively, pilots should be ever watchful for other aircraft and never rely on the other pilot giving way. If you are approaching another aircraft you should make a course correction early (even a minor one), so that the other pilot is aware of your intentions.

To summarise when you should give way when on a collision course, remember:

"Unless the other aircraft is on your right or the ridge is on your right – always see and turn right!" Right?

RIDGE SOARING

You will find when ridge soaring that a pattern will usually develop, particularly in light conditions, with pilots following

each other through the pattern to reduce the likelihood of conflict.

Where there are gliders of differing speeds and manoeuvrability operating together (such as paragliders and hang gliders) it can be difficult to establish a safe soaring pattern. To a lesser degree the same applies when beginner gliders are operating with faster high performance gliders of the same type. When ridge soaring it is beneficial for the slower gliders to make shorter passes, thus allowing a similar time for each of the various gliders to complete a pass, and more readily enable a safe pattern to be established.

THERMAL SOARING

When thermalling, higher gliders must be ever watchful for gliders coming up at a faster rate and be prepared to give way. Where gliders are circling at similar heights in overlapping circles it is necessary to change the circling pattern so that each glider's 360 is around the same centre.

Pilots must be extremely vigilant in crowded conditions – head for the landing paddock if you are not comfortable with the crowd. By far the safest course of action if it appears to be crowded in the air is Don't Take Off – wait until the crowd thins.

MICROLIGHTS

The same 'Rules of the Air' apply to all aircraft, though obviously microlight pilots do not use the ridge soaring rules. The vast majority of mid-air collisions occur in the vicinity of an airstrip or airport. Therefore microlight pilots must be extremely vigilant whilst either descending to join circuit, or whilst in circuit. When on base leg and when turning onto final, a good check upwind is essential to ensure that no faster aircraft are already on final and approaching at a flatter angle.

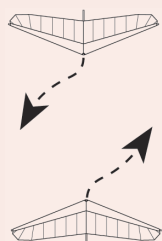
When flying cross country, motorised aircraft follow specific "cruising levels" which keep aircraft heading in opposite directions at different heights. During your training you will learn how to follow these procedures.

Whatever aircraft you fly you must be ever vigilant, the maxim is:

'LOOK OUT AND LIVE.'

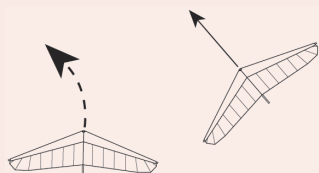


The glider with the right of way shall maintain course and speed according to the following rules. It is the responsibility of all pilots at all times to take all possible measures to avoid a collision.



Head On:

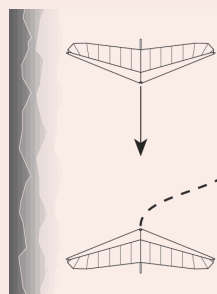
When two gliders are approaching each other head on, or approximately so, each pilot shall turn right.



Converging:

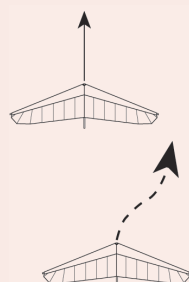
When two gliders are converging at approximately the same altitude, the pilot which has the

other aircraft on their right shall give way.



Head On on a Ridge:

The pilot with the ridge on their right has right of way (and may stay closest to the ridge).



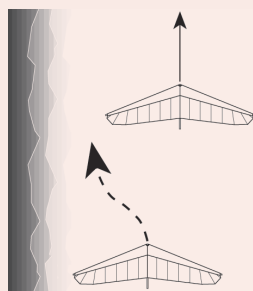
Overtaking:

The overtaking pilot shall keep well clear of the glider they are overtaking by passing on the right side.

Landing:

The lower glider has the right of way, but should not cut in front of another glider which is on final approach.

If a pilot is aware that another glider is making an emergency landing, they should give way to it if it is possible to do so safely.

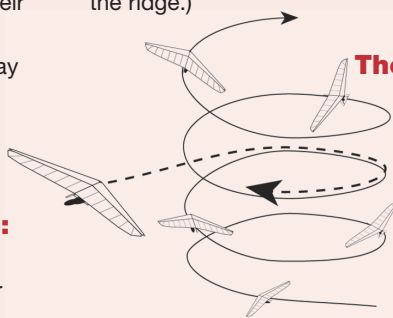


Overtaking on a Ridge:

The pilot who is overtaking shall pass between the other glider and the ridge.

This is so that the glider being overtaken does

not turn into the passing glider. (When ridge soaring, turns are normally done away from the ridge.)



Thermalling:

The first glider in decides which direction to circle and all others must follow the same direction.

Overtaking while climbing:

The lower glider has right of way. The top glider must let the lower glider through, as the lower glider cannot see clearly above.

This rule also applies when ridge soaring.



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245 SNAKES ALIVE



Coming up to Moree – the day is looking great!

DURING SUMMER 2002/03 GODFREY WENNESS SET A NEW AUSTRALIAN PARAGLIDING
DECLARED GOAL RECORD: MT BORAH, MANILLA TO MUNGINDI – 245KM IN SIX HOURS.

The big days in Manilla usually come in runs of two or three. We were expecting more, but so far this season we had only seen glimpses of the 2002 one-in-a-100-year-drought's potential. A few months earlier the 3,000m plus days were epic for freezing cold cloudbases and awesome views, but not for distance. The exception was a blazing 156km in three hours to Ebor near Coffs Harbour. If only that speed could translate to a whole day of flying, we might have a chance at the new 423km mark set in Texas June 2002.

The early January south-east days were windy enough but stable until after midday and sinky as hell. I tried a few times in December to get away at 10am to achieve the magical 10 hours needed but to no avail. The calculation was simple – they did 400+ in 10 hours in Texas for an average of just over 40km/h. I flew faster at 45km/h way back in 1998 on a serial Omega 4 for the 335km record. Now with my brand new cutting edge technology Omega 6 prototype I

TASK DECLARATION FORM
 Task: 03 - Paraglider - Dec Goal
 Date & Time: 12 JAN 2003 10:45
 Pilot: Godfrey WENNESS
 FAI: 17216
 Glider: Omega 6 proto
 Departure Pt: Mt Sorell East
 Elevation: 30.40.56
 Turn Pt: 150.36.34
 Finish Pt: Mungindi
 28°58'41" 148°59'40"
 Official Observer: Suzi Smith
 FAI ID# 18318
 PARAGLIDING CLUB SECTION (CLASS 8, MARCH 1987)

The flight declaration

had managed 50km/h a few times, though not for the whole day. But wait – 50km/h means I only need just over eight hours! Hmm, you never know – get the right day and we're in the race again... but from a hill launch and in non hostile, non desert country side – a Sunday walk in the park compared to Texas!

On Saturday 11 January 2003 I was on final glide of a six hours 242km open distance practise flight near Boomi on the Queensland border and thought a declared goal record might be more interesting than open distance given the lack of consistent wind and late starts we were getting (after midday).

The day after the 242km didn't look any different – a bit windy, blue and the classical coastal south-east cloud line was coming in sooner than usual. Okay, lets try a National Declared Goal of a similar distance – Boomi or Mungindi. I changed the form a few times before settling on the latter, took the pix, flicked the barograph and I was away at midday...

to the bomb-out – almost. A rough scratchy climb got me to the hill height inversion then a few times down the valley for the first 15km.

To my shock unlike the previous days, the clouds were already spread all the way across the northwest sky past Moree – a situation we didn't see from launch. Damn, I should have declared a 300km goal – well above the current world record.

I already felt I'd blown the days potential as I tracked an inversion busting boomer out of Tarpoly.

Three hours later and after one mega-low save in the Horton Valley (less than 10m off the deck for over 200m of bubble drift!), I was 150km from home, overhead Moree. That was 50km/h – holy smokes – if it carries on 'til after 8pm 400km was on for sure. Over the past few weeks I felt like I was flying the Omega prototype the best I had ever flown in 15 years – in tune, on the ball and fast – today was no different. Suzi, my partner, was below in the Pajero and the drift was to the goal and beyond – a double maybe!

But as all good things (like world records) never last, the wind switched off mid-afternoon just as the over 400km calculation looked realistic and the clouds were streeting in places. I tried hard to maintain the average but it just slipped away as the 20km/h tailwind died along with the strong lift of earlier. By 5pm at 210km out, something around 300km was still on – not a PB for me but a nice flight for the National CMAC XC League. Points wise the Goal flight would score similar though with its 1.2 bonus factor.

The Mungindi goal I set was looming in the distance as I used both gloved hands to wrestle with some jelly snakes that were stuck together. It was one of those classical quiet moments on high glide when all of a sudden – bam-o, out of nowhere a nasty little core came ripping through that needed instant control. The video would have no doubt won "Australia's Funniest Home Videos". The snakes flew, I flew, but with no hands on the brakes the Omega didn't do so well. So with two snakes saved and some easy cruisy flying, Mungindi saw its first ever paraglider land next to the town swimming pool an hour later at 6pm.

There was a solid two hours of flying to go. Should have, could have, would have, but either way I set the days' goal too short for its 300km+ potential. At 245km it was a nice new Australian Declared goal record for sure (the previous was mine at 161km during the 2002 Manilla Open) but the World Record was easily in the bag... there's always next time.

Meanwhile some kid in the middle of drought-affected-nowhere is still talking about the snakes that fell from the sky...



Godfrey Wenness is CFI at Manilla Paragliding, owns Mt Borah and held the 335km Paragliding Open Distance World Record from 1998-2002. It is still the longest hill launched flight in the World – that story, and his 223km longest Tandem flight in the World story can be read at the Manilla SkySailors Club website: [www.mss.org.au].



A wedgie showing the way

What is the CMAC Cross-country League?

The CMAC league is the name for Australia's Cross-Country League. It is a handicapped league where hang gliders and paragliders of all skill levels can compete equally. Pilots enter their cross-country flights on the internet via a website hosted by WA's Western Soarers Club [www.iinet.net.au/~navi/xcleague.htm]. The flights are automatically bonused according their declared type and difficulty – open distance, declared goal, out and return and triangle. Paragliders get more points than hang gliders due to performance differences and novice and intermediate pilots get extra bonus factors provided they are flying gliders in their pilot rating class. Thus the League provides a level playing field so that for example a novice paraglider can compete with a top class hang glider pilot and win. In 2002 a novice paraglider pilot was in third place overall! The League also allows pilots to see where and when the big flights have been done and who is flying them.

The first two Summer Leagues – 2001 and 2002 – were both been won by Godfrey Wenness flying his paraglider from Manilla's Mt Borah. There is also a Winter League which was won in 2001 by WA's Mike Dufty (PG).





Competitions in Australia

Michael Zupanc

BROADLY SPEAKING, COMPETITIONS COME IN TWO FLAVOURS. “FUN” COMPS AND THE “SERIOUS” COMPETITIONS. THE FUN COMPS ARE USUALLY ORGANISED BY LOCAL CLUBS AS A MEANS OF GETTING PILOTS TOGETHER TO FLY IN A SOCIABLE ENVIRONMENT, WHERE TIPS AND GUIDANCE CAN BE PASSED ON FROM EXPERIENCED PILOTS TO THE NOT SO EXPERIENCED.

COMPETITIONS, WHETHER SERIOUS OR NOT, GET PILOTS TO STRETCH THEIR ABILITIES, AND EXPAND THEIR SKILL AND EXPERIENCE QUICKER THAN THEY WOULD IF THEY JUST WENT FLYING ON A CASUAL BASIS. BUT JUST WHAT IS A COMPETITION?

Hang gliding and paragliding competitions can come in a variety of forms. The most common, and the basis for the “serious” comps, is cross country racing. These competitions are run over a period of time, maybe one or two weeks. A task is set each day, where the pilots start at some designated point and fly a designated course. This course may be anything from 30 to 300 kilometres long, and the pilots may have to go via turnpoints to get to the goal. The fastest pilot will be the winner on the day. If the pilot does not reach the goal, then points are awarded according to how far that pilot flew.

Serious competition is a professional sport, with tightly controlled rules and procedures. The casual competitions can still use the same format as the big events, but in a more friendly environment and with less bureaucracy. Fun competitions can be as simple as a “spot landing” where pilots test their skill by getting points for landing as close as they can to a spot on the ground.

Some new types of competition are becoming popular, for example “Speed Gliding” where pilots race down mountainsides weaving in between pylons, similar to slalom skiing. The pilots are timed individually and the quickest wins. Aerobatics, or freestyle flying, has been a competition format as well. Pilots perform wingovers, spins and loops and are judged on the accuracy and grace of the manoeuvres.

The Hang Gliding Federation of Australia filmed a Grand Prix series of speed gliding, freestyle and match racing* which was shown on national television. Worldwide, this type of competition is becoming popular because it can be easily filmed and presented to an audience. The serious competitors will not only be chasing the trophies at the end of the comp, but also ranking points that will go towards that pilots national ladder position and international ranking.

The international aspects of the sport are controlled by the FAI, the Fédération Aéronautique Internationale (<http://www.fai.org/>), which is the governing body of all sport aviation. Under this is the CIVL, the Commission Internationale de Vol Libre (http://www.fai.org/hang_gliding/), which controls the competitive aspects of hang gliding and paragliding.

The really serious competitions, like World Championships and a few other specially selected events, are controlled by strict rules under the watchful eyes of an international jury. One step down from this are the “second category events” like National titles and other major events. Australia hosts a number of second category events each year, and in 1988, 1997 and 1998, we hosted World Championships.

Pilots national ladder points are gained by their results at sanctioned competitions. The competitions are graded with some events being worth more points than other events. The sanctioning system works on the basis of getting all the top pilots to attend selected competitions that are run in accordance with the Australian Competition Manual (which in itself, conforms to the FAI rules). After that there will be a number of lower scoring competitions that pilots can use to “top up” their points, or they can use these comps to gain experience in competition flying and start making their way up the national ladder.

The Sanction system is controlled by a competition committee (<http://users.hunterlink.net.au/~dditl/hgfacc/hgfacc.htm>). This committee is made up of a group of pilots, some of whom are seasoned international competitors and some who are social competitors. The committee endeavours to put together a set of rules that cater for both the serious and fun competitions, with a scale of sanction points that are available for the different events. Competition organisers submit bids to the committee for sanction allocations and those bids are then judged on their merits and an appropriate sanction is allocated for the event. Anyone can run an event that does not have a sanction value, and these casual gatherings are very popular with a lot of pilots. Serious competitions can have a lot of pilots in them, sometimes up to 200, from all around the world. The casual, fun events can also have a lot of pilots, and these events are a great way of getting some friendly rivalry going between clubs and regions.

Competitions can be whatever you want them to be. From the cutting edge of the big events where top pilots are using the very latest technology battling for prestige and sponsorship dollars, down to weekend “fly-ins” where a bunch of mates will get together to see who buys the beers afterwards.

Competitions are where a lot of pilots fly personal best flights, going further or higher than they have before. Competitions can be a great excuse to travel to new areas and fly different sites. To fly over glacial mountains and foreign deserts, or just boat around in your backyard. Competitions can start all sorts of exaggerated stories, or it can settle them. After all, the bullshit stops when the flag drops.



** This video can be ordered from the HGFA office, see “HGFA Merchandise advertisement or phone 02 6559 2713 for more details.*



GUIDELINES FOR INTENDING COMPETITION PILOTS

HGFA Competitions Manual – Section 3

THIS SECTION HAS BEEN CONTRIBUTED BY JENNY GANDERTON AND UPDATED BY MIKE ZUPANC AS A GUIDE FOR THOSE PILOTS ENTERING COMPETITIONS FOR THE FIRST TIME.

3.1 EQUIPMENT

During a competition, you need to be able to concentrate on flying the task and making decisions; 'where you will find that next thermal?', etc. The last thing you want is hassles with your equipment, so get used to carrying it and using it well before the competition. At least 50% of success in competitions stems simply from being organised!

Naturally, when you fly in a competition you will need all your normal flying equipment such as harness, helmet, glider, altimeter and vario, but there are some other indispensable items, which you may not routinely fly with.

Parachute

Most pilots who fly cross-country carry a parachute anyway, but many competitions stipulate in the rules that a parachute must be carried. Many also demand that the pilot has a back-up hang loop and carabiner, though generally a single stainless steel screw gate carabiner is acceptable.

Camera

A 35mm camera is essential in competitions to photograph turnpoints. Many pilots carry a back-up camera also, in case the photographs from the first one do not come out for one reason or another.

A small, light, simple, cheap camera is best for the job. Remember that the more features it has, the more chance it has of going wrong! However, a databack camera which prints the time on the film is a necessity in hang gliding, as most competitions use databack time prints for start times. This eliminates the need to have officials timing launches and gives the pilot more flexibility in choosing the best time to start on the course.

Databack is not used in Australian paragliding competitions. Some international competitions still require it, but none have set tasks requiring it for some years now.

One camera is probably sufficient for your first few competitions until you get the hang of aerial photography in rough thermals! Practice using the camera when free

flying, and find a reliable and convenient way of attaching it to your harness.

If your camera needs batteries, always carry spares. Remember that the databack usually uses different batteries than the ones that run the rest of the camera. Get familiar with your equipment and keep a check on the life expectancy of the batteries, keeping in mind that a battery that works fine when you are warm on the ground can fail when the temperature drops with altitude. Alkaline batteries hold their voltage in cold conditions better than carbon batteries.

You will also need film. Be sure to get the competition film at the appropriate time, as it may not always be available on launch.

GPS

The use of satellite navigation equipment is now commonplace in hang gliding.

It is likely that GPS equipment will supersede cameras as turnpoint, start and possibly goal verification. GPS's are generally reliable pieces of equipment, but they go through batteries at an amazing rate! The only practical way to use a GPS on a regular basis is to have rechargeable batteries, either a large ni-cad, gel cell or similar, that is mounted on the GPS bracket, or 1,000mAh (or better) rechargeable internal batteries. Get familiar with the instrument before the competition. Sort out a reliable power supply that will last for the duration of a long flight, and arrange suitable battery charging equipment that will give you fresh batteries in time for the next mornings start.

Radio

Not essential (except in Towing Competitions), but extremely useful. Radios enable team flying and are a valuable safety tool if someone is in distress. Most pilots now use UHF CB for hang gliding and this gives very reliable and clear communication, and there are also repeaters in many places which make it possible to talk to a retrieve vehicle in another valley. The use of mobile telephones can also help with retrieves. You can often improve mobile service or radio coverage if

you get yourself to an elevated position, even standing on a fence post can help.

There are several brands on the market, all of which seem to perform well. I prefer to use a radio which has the channel selector on the top, so that I can change channels in flight, for example if coming into goal and wanting to warn the goal marshal that I am almost there. While you can get by with just the radio, reception is often poor due to wind noise and you may find yourself going into a turn while trying to bend your head down to talk into it – not the best option for efficient flying. A separate push to talk (PTT) microphone which can be clipped on somewhere handy is a big improvement and sticking foam onto the front of it will eliminate most of the wind noise. Headsets are very good because you never have to fumble for the mike. They also completely damp out the wind noise, but are expensive.

Headsets, finger PTTs, etc. all greatly increase the chance of equipment failure. A paraglider pilot can often get away with a chest harness mounted radio, on an angle such that the PTT is very close to your thumb when holding the brake in trim and with a piece of foam over the radio face.

A UHF handheld will cost in the region of \$600, a microphone about \$65 and a headset about \$100, but prices are extremely variable, so it pays to shop around. Car sets are cheaper at about \$400, and most have a very useful scan facility.

There is no point in having a radio if the batteries are flat! Charge your batteries every night during a competition, unless you know the radio has had very little use. If possible, carry spare batteries with you in case the radio dies while you are flying. At least you can have a functioning radio once you have landed.

Spare battery packs are expensive, but with some brands of radio you can get a battery case which holds ordinary AA batteries and slides on in place of the rechargeable pack. It is worth remembering that many landholders use UHF radio, and may be able



to help you contact your ground crew if your radio has died.

Get used to flying and talking on the radio before the competition, otherwise you may find it distracts you.

Maps

You will definitely need to fly with a map to be able to navigate your way around a course and find the turnpoints.

Find out which maps you will need and obtain them before arriving at the competition. Many country towns do not have shops that sell topographic maps and even if they do, they usually cannot meet the demand of a sudden influx of 50 or more pilots all wanting the same map.

Mapholder

You can buy a mylar map fairing from most suppliers of hang gliding gizmos, and they are fairly inexpensive.

They fit most easily on the basebar and it's easiest to read the map in this position. So if your vario is basebar mounted, you could have difficulties and it might be worth moving it to the upright. It's less prone to accidental damage there anyway. Paragliding map cases are usually attached to the cross straps at the bottom of the harness, and lie on the lap in flight. If the case is not heavy enough, another strap may be needed to hold the case to one leg.

Practice flying with a map, even if you are only ridge soaring. Look around and find the features from the map on the ground. See if you can pick out which road is which. This is hard at first, but comes with practice.

Compass

I often fly without a compass and find I can orient myself just by reading the map. However, they can be useful if you totally lose track of where you are – you can at least find out which way you are facing! As a means of avoiding disorientation in high fog, they are not much good, but quite helpful in deciding which way to head off when you come out of it.

Many pilots swear by compasses and wouldn't fly without one, but if cash is tight, there are more important things.

Airspeed Indicator

Again, I feel these come in the category of useful and interesting, but not essential. I do not usually use one and when I do, I often forget to look at it. Good for comparing notes in the pub after a day's flying, 'what speed were you gliding at crossing that gap?', etc. and such information can be useful. You can, of course, work out your glider's polar, calculate your optimum speed to fly and use the ASI to fly it. I suspect that if you are new to competition flying, you will have plenty of other things to think about to start with.

Pencil, Ruler, Eraser

Extremely useful at briefings to mark the task on your map. I usually use a pencil to mark the task, so that I can rub it out next day and not get confused with the next day's task. It is particularly important to mark the photo sector for turnpoints.

Instruments

Your old favourite vario which you are used to and comfortable with is best. Do not try

out a new vario in a competition, unless you've had to because yours has broken.

Make sure the batteries have plenty of life in them, carry spares in your harness all the time so you can change the battery on landing if you have had to go on to reserve. If you do not do it straight away you might forget.

Most new varios these days are a combined package of variometer, altimeter, air-speed indicator, speed-to-fly calculator, barograph and even built-in GPS. These features are very important considerations for a performance pilot, but they will not lead you to your next thermal! Be practical in balancing cost against features when selecting a new instrument. Get a second-hand instrument first up and build on your flying skills. By the time you can make real use of all the flash gizmos, new and better ones will probably be available.

Towing Equipment

Bridle, lapsash, attachment point on the glider, weak link and radio are all essential. Nothing happens at all without good **reliable** radio communication. You need a quick easy way to clip on the mike for take off. Think about it before you arrive in the paddock.

Provide your own weaklink; it is your responsibility, no-one else's. A spare bridle is handy, or at the very least a spare release, because sometimes they break and its frustrating if something like that prevents you from taking off. Have a hook knife somewhere on your harness so that you can get at it and use it in an emergency. When there are all sorts of ropes and lines about, there is the possibility that one could get caught

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in the wrong place, or your release might fail. Along with realistic weaklinks, a hook knife can get you disconnected if you need to in an emergency. Efficiency and organisation are essential in a towing competition. Practicing beforehand with the other members of your team is vital.

Money

A very important item of equipment. You may land out near a pub and where would you be without the cash for a beer? More seriously, you could be waiting a long time for a retrieve so it is only sensible to carry enough money with you for a meal, phone calls and possibly petrol. You may be retrieved by a car with an empty tank.

Fuel

Not really hang gliding equipment, but amazing how often it gets forgotten. Petrol stations in country towns are seldom open 24 hours, so make sure your driver fuels up before he/she comes looking for you, especially if you are far away.

Fast efficient retrieval is a great advantage in competitions – you get back in time to sort out your gear, put your radio on charge and get a decent night's sleep ready for next day's flying.

Navigation and Map Reading

Reading a map is an important skill in flying cross-country and like any other skill it takes practice.

The best maps to use are 1:250,000 topographic maps, but if these do not cover a large enough area, the 1:1,000,000 WAC charts are good, as are the military ONC and TPC maps. They are designed for pilots and show features recognisable from the air. Failing either of these, a road map is better than nothing.

The smaller scale maps (ie, 1:50,000 or 1:100,000) do not show a large enough area for most XC flights and the scale can be confusing because you can see so far from the air.

Practice flying courses rather than ambling off any old where downwind when you fly cross-country.

Study the map on the ground, decide where you want to go and pick some obvious feature as your goal. Not just "Narromine" for example, but perhaps Narromine Silos or the road junction just to the north of town.

Once you have decided where you will try to go, look for obvious landmarks along the way.

Roads which are marked red or brown on the map will all be grey bitumen from the air and possibly not easy to tell one from another. On the other hand, railway lines tend to stand out, as there is usually only one.

Major rivers and lakes can be useful landmarks, particularly if they have a distinctive shape, but beware of small creeks – there may be loads of them and not all will be on the map.

Draw a line on the map along your intended course and circle the major landmarks along the way so you can pick them out easily. When you are in the air, you can pick out the landmarks from a great distance and fly towards them.

In mountainous terrain, mountains and valleys provide the landmarks. Before you take off, identify all the peaks you can see from launch on your map. Pick out large obvious ones by the contours on the map, which you should then be able to recognise on your way. Again, lakes make a useful marker, as they are highly visible from the air.

When you have flown several times in the same area, you will get to know what the towns look like from the air, but at first, they all look very much alike unless you know of some particular distinguishing feature.

Remember to use the sun as guide to direction, especially if you don't have a compass. Obviously, the sun will be in the west in the afternoon, so if you have it to your left, you must be facing north.

Make sure your driver (if you are lucky enough to have one) is using the same map as you so you can explain where you are more easily, eg: 'just below the C of Cookamidgera', etc. Alternatively, with a GPS, tell your driver your distance and bearing to the goal or next turnpoint. The driver can get your position with great accuracy this way. In addition, if the driver has a GPS (and knows how to use it) you can radio the co-ordinates of your obscure landing position, sit back and wait.

If you find reading the map in the air hard, don't despair, keep practicing and if all else fails, you may be able to follow other gliders. In a competition there will be heaps about – just hope they are not all as lost as you are!

Turnpoint Photography

Taking turnpoint photos can be a fumbling disconcerting task, as you try to fly one-handed, avoiding all the other gliders in a

gaggle, getting tossed about in rough air and sinking like a brick as you round the turnpoint, take the photo, try to put your camera away again and beetle back to the ridge or thermal as fast as possible to attempt to get up again.

Familiarise yourself with the rules for turnpoints. They are standard FAI rules and you will find them in the HGFA competitions manual. Mark on your map the area you will have to be in to take the photo.

You must demonstrate that you have gone around the TP – vertically above it is dangerous. If it is a building, take the picture as soon as you can see the back wall. This will prove irrefutably that you were past it. If it is a road junction, you will just have to go far enough past it so that it is obvious in the photo.

Use vertical objects such as trees or power poles close to but beyond the TP to judge this. Remember, you must not be more than one kilometre away from the TP. The TP itself must be visible in the photo.

Devise some arrangement whereby you can get your camera out and put it away again with a minimum of fuss and bother. Velcro on the back of the camera can be helpful to stick it to the harness temporarily when you get close to the TP. Needless to say, tie the camera firmly to your harness with string or bungee.

Taking the photo quickly can save a fair amount of time when you are racing and may mean the difference between getting that next thermal and missing it. The more you can cut down on the fumbling the better.

Finding a fumble-free system of using two cameras is harder so it may be better to just use one to begin with.

Remember you need to be organised. You need to be familiar with your equipment and know when to replace or recharge all the different batteries. You need to practice flying courses like you would be doing in a competition, and you need to practice flying with, and using, maps cameras and GPS equipment if you have it. You need to watch other pilots. Watch their successes and failures and figure out flying strategies for yourself. Launch early so that you can fly with the faster pilots (for a while at least). If you launch after them, they will disappear into the distance and you might not see them until you make it to the pub. Learn to lead out confidently, because as long as you follow, the best you can do is second.





FAI PROFICIENCY BADGES

Ian Jarman

IS YOUR CLUB LOOKING TO ORGANISE FLYING SKILLS ACTIVITIES FOR YOUR MEMBERS THAT ARE NATIONALLY (INDEED INTERNATIONALLY) RECOGNISED, PROVIDE MEANINGFUL CHALLENGES FOR ALL SKILL LEVELS AND WING TYPES AND REQUIRE MINIMUM ORGANISATION AND SUPERVISION? THEN THE FAI RECORDS AND PROFICIENCY BADGES MAY BE THE ANSWER.

The FAI Proficiency Badges provide an appropriate challenge and focus for all kinds of sport flying. There are a number of FAI badges (standards of achievement) which provide a range of progressively more challenging flights which are ideally suited as club organised activities and ideal for all levels of experience across all disciplines.

For hang gliders the standards to be achieved are:

Delta Bronze Badge

A distance flight of at least 15km, or a gain of height of at least 500m, or a duration of flight of at least one hour.

Obviously this badge could be achieved on any sort of glider and is a suitable target for any restricted certificate pilot. Clubs could organise bronze badge days for their less experienced pilots and those that need

to work on their landing technique. The club safety officer or committee should endorse the claims when submitted to the HGFA for issue of the badges. The badges would then be provided for presentation at a suitable club gathering.

Delta Silver Badge

A distance flight of at least 50km, and a height gain of at least 1,000m, and a duration flight of at least five hours.

These do not need to be achieved in the same flight. Once again clubs could organise sites and days for intermediate and advanced pilots to log these flights. Once again glider performance is not an issue and the club could have the observers witness the pilots flights and endorse their log for each qualifying flight before final claim is submitted to the national office for issue of the silver badge.

Delta Gold Badge

A distance flight of at least 300km, and an out and return flight or triangle of at least 200km.

We are starting to get into the more demanding realms here, but there are several ridges in Australia that offer the potential for 200km Out and Return (ie, 100km out and 100km back). The Illawarra escarpment offers some potential here, but the Eucla cliffs are possibly more reliable. A 200km triangle can be attempted on a good light wind summer day just about anywhere in inland Australia. If this were done in accordance with record rules a new national record would be set. For the badge, a near completion of the triangle still qualifies.

The final hang gliding badges are Delta Diamonds of which there are three separate badges:

Diamond Distance

A distance flight of at least 500km

Diamond Goal

A goal flight of at least 400km

Diamond Closed Course

Return or Triangle flight of at least 300km.

For paragliders the standards to be achieved are:

Eagle Bronze

Distance 15km, or Duration 1 hour, or Gain of Height 500m.

(As anyone of these flights will qualify for the badge perhaps clubs might increase the challenge by requiring all three flight achievements on separate flights.)

Once again these challenges are very appropriate for Restricted pilots with limited experience..

Landowner Rights and Pilot Responsibilities

HGFA Operations Manual

The following extract from the HGFA Operations Manual is self-explanatory. Without the ongoing acceptance of landowners our sports would not be possible – all pilots must work to maintain good relations with land owners.

Craig Worth, HGFA General Manager

Operations on or over private or public property must be conducted with due regard to the rights of the landowner.

Hang gliding, paragliding and microlighting operations rely on the good will of landowners. When outlanding, pilots should:

- endeavour to contact the land owner to explain their situation and thank the landowner for use of their property;
- refrain from having retrieve vehicles drive across paddocks; and
- walk from the paddock taking care to leave fences, gates and any other property as found.

Civil Aviation Regulation 93 states:

“Nothing in these Regulations shall be construed as conferring on any aircraft, as against the owner of any land or any person interested therein, the right to alight on that land, or as prejudicing the rights or remedies of any person in respect of any injury to persons or property caused by the aircraft.”



Eagle Silver

Distance 50km and Duration five hours and Gain of Height 1,000m.

Restricted and Intermediate Certificate pilots under club supervision could attempt these flights. These do not need to be achieved in the same flight and once again clubs could organise sites and days for pilots to log these flights. Glider performance is not an issue and the club could have the observers witness each qualifying flight before the final claim is submitted to the national office for issue of the Silver badge.

Eagle Gold

Distance 100km and Duration five hours and Gain of Height 2,000m.

These do not need to be achieved in the same flight. Again clubs could organise sites and days for advanced pilots to attempt these flights. The club could have the observers witness the pilots log for each qualifying flight before final claim is submitted to the national office for issue of the silver badge. Flights from sanctioned events as supported by the results would also count for these badge flights.

There are two separate Eagle Diamonds:

Diamond Distance

A distance flight of at least 200km.

Diamond Gain of Height

A Gain of Height of 3,000m or more.

For microlights the standards to be achieved are:

Bronze Colibri

- a) 20 hours solo including at least 50 flights
- b) Three precision landings within 10m of centre given spot
- c) One precision landing within 20m of spot from a height of 1,000ft agl with throttle fully closed. Demo of correct go around (overshoot) procedure
- d) Two 75km XC flights over a triangular course, one with an outlanding at a designated point.

Silver Colibri

- a) 100 hours and 200 logged flights
- b) Two flights to approximately 1,000ft agl stop engine complete
a 360 degree turn and land within five metres of spot.
- c) Four 150km XC flights with any landings or turnpoints pre-declared.

If clubs are looking for suitable programs to offer their members perhaps these FAI badge flights offer a suitably graded set of goals where pilots of all levels can advance their skills and sense of achievement. (These

activities would qualify under the NSW Disability Insurance Scheme where the club has organised to control the flight attempts.)

We in the HGFA office would love to be issuing badges regularly throughout the coming year and for the more advanced pilots there are many spaces in the record books for your name.

HOW TO SET A NATIONAL RECORD

It is obvious that if you are up to the gold and diamond level badges then you are starting to approach national and indeed world record standards. The tables of Australian records indicate that there are many records that are up for grabs. This is because that some of the records are now somewhat dated and new equipment should make surpassing the old mark reasonably easy or the record has yet to be claimed at all and hence any attempt in accordance with the rules will give the pilot a national record.

Setting a national record does not require you to be a champion. All you need is average advanced pilot skills and an ability to organise the logistics and paper work. According to Rohan Holtkamp holder of several World and National records, the hardest part is completing the record claim documentation not the flight.

SO WHAT IS REQUIRED TO ATTEMPT A RECORD?

An FAI sporting licence. (This is available from the HGFA National Office for a small fee and comes with the rules for attempting records and the necessary claim forms for submitting your flight details.)

You will need to arrange at least one FAI official observer to witness the critical parts of your flight and to verify the claim forms and documentation. Another pilot or member can do this or your driver can be appointed as an official observer. These people will need to take at least Associate Membership of the HGFA to cover the period of the record attempt and claim. You will also need an approved barograph (most of the newer flight instrument sets come with a barograph – the FAI home page lists the approved instruments [www.fai.org]) and for out and return or triangle flights, a camera. Then all you need is to set your sights on a specific record and go after it.

Full details are contained in the FAI Sporting Code – General Section and Section for hang gliders and paragliders and Section 10 for microlights and motorised hang gliders and paragliders. For further information contact the HGFA Office.









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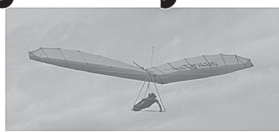
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Glossary of Terms



ACPUL – European airworthiness testing body for hang gliders and paragliders.

Aerodynamics – The study of the movement of a body, such as a hang glider wing, through the air.

Aerodynamic controls – Moveable surfaces used to control a glider. These consist of elevators, elevons, rudders, spoilers and ailerons. Flex-wing hang gliders usually do not have aerodynamic controls, whereas rigid wings usually do.

A-Frame – A triangular set of three tubes used for support and control (control frame).

A-Line – Line to the leading edge of a paraglider wing.

AGL (agl) – Above ground level. Altitude above the ground, generally measured in feet.

Aerofoil – A curved surface designed to generate lift when moving through the air.

Airspeed – The velocity of a glider through the air. This is not necessarily the speed of the glider over the ground.

AMSL (amsl or asl) – Above Mean Sea Level. Altitude above sea level.

Angle of Attack – The angle the relative wind makes with the chord of the wing.

Aspect Ratio – Ratio of span to chord, or squared span divided by wing area. Higher aspect ratio usually means less induced drag.

Attitude – The amount of nose-up or nose-down relative to the horizon.

Bank Angle – The angle the wing makes with the horizontal in roll.

Barograph – Instrument which traces altitude during flight. Used to verify record claims.

Batten – Stiff shaft inserted into the sail to hold shape.

B-Line Stall – A manoeuvre to disrupt the smooth flow over a paraglider wing by pulling down the B-lines. Used as a quick descent manoeuvre.

Blue Thermals – Thermals that don't produce clouds due to low moisture content.

Bomb-out – Landing area beneath take-off or the action of landing near take-off without flying a significant distance.

Brake – Control to alter speed or direction of a paraglider.

Camber – The amount of curvature on the upper surface of an aerofoil.

Carabiner – An oval ring used to attach the harness to the hang loop.

CB, Cunimb (Cumulonimbus) – An

overdeveloped cumulus cloud which indicates thunderstorms associated with very strong lift, sink and turbulence – to be avoided by all aircraft.

Centre of Gravity – The point along the keel where the pilot's weight is suspended.

Chord – Measurement of an aerofoil from the leading to the trailing edge.

Cirrus – Very high ice clouds.

Crevatte – A paraglider collapse resulting in a wingtip entangled in the lines.

Collapse – Partial or complete loss of pressure in a paraglider, resulting in a loss of aerofoil. Usually recoverable with brake input.

Cumulus – A 'heaped' cloud found above thermals.

Control Bar – A triangular set of three tubes used for support and control.

Co-ordinated Turn – A steady state turn in which a slip, skid or stall does not occur.

Cross Bar – A spar running perpendicular to the keel which holds the leading edges in place.

Cross-country (XC) – A distance flight in a glider.

Damping – Tendency of a glider to resist motion in a particular direction. Damping in pitch is a tendency to resist a change in angle of attack.

DHV – German association and airworthiness testing body for hang gliders and paragliders.

Dihedral – An upward angling of the wings from side to side. Used to create roll stability.

Divergence – Tendency of a glider to enter an ever-steepening dive when flying fast.

Dive Stick – A device holding up the rear of the sail at the wing tip to provide dive recovery.

Downtube (DT) – One of the uprights of an A-frame.

Downwind – Flying in the direction the wind is blowing (flying with a tailwind).

Drag – The energy losses of a glider due to the friction of the air or as a by-product of the production of lift (parasitic and induced drag respectively).

Fairing – A streamlining device used to reduce parasitic drag.

Flare – The action to pull full brake on landing a paraglider or to push the control bar forward and up to land a hang glider.

Glide Angle – The angle between the glide path and the horizontal.

Gliding – Unpowered flight that continues from an elevated point to a lower point.

Glide Path – The flight path of a glider.

Glider – An unpowered, heavier-than-air aircraft, includes hang gliders, paragliders and sailplanes.

Glide Ratio – The ratio of the distance travelled forward to the distance dropped by the glider. One of the main measures of glider performance. In calm air this is equivalent to the lift to drag ratio of the aircraft (L/D).

GPS – Global Positioning System, an navigation aid/instrument which uses satellite data.

Ground Effect – An improvement in glide caused by proximity to the ground.

Ground Speed – The velocity of a glider over the ground. If any wind is present, airspeed and ground speed will differ.

Hang Loop – A loop of webbing or rope used to attach the harness to the glider.

Harness – A suspension system that supports the pilot and attaches him to the glider.

Heading – The direction a glider points in flight (different from actual flight direction in a crosswind).

HGFA – Hang Gliding Federation of Australia. The governing body of hang gliding, paragliding and microlighting in Australia.

Keel – The spar running fore and aft in the centre of a glider.

Kingpost – The upright tube on top of a glider used to support the wing when not in flight. Also supports the reflex bridle.

Lapse Rate – The rate of temperature decrease with height.

Leading Edge – The forward-most part of a wing. The spar that forms this forward part.

Lee – The side of a cliff face, mountain, building or row of trees that faces away from the wind. See "Rotor" turbulence for dangers involved in leeside rotor.

Lift – Rising air used by a glider pilot to soar. The upward force created by a wing.

Lift to Drag Ratio (L/D) – A comparison between the lift forces and drag forces created by a wing. An important measure of performance which determines how far a glider can fly with a given amount of altitude in calm air.

LZ – Landing Zone.

Max Glide – The best possible (maximum) glide ratio for a given pilot/glider combination.

Microlight – A motorised ultralight aircraft using weightshift controls and a wing similar to a hang glider. Also called a trike because of its three-wheeled base.

Min Sink – The best possible (minimum) sink rate for a given pilot/glider combination.

Nose Angle – The angle between the leading edges.

Nose-in – An accident in which the pilot lets the nose of the glider get too low on take off or landing so that it hits the ground.

Nose Plate – The plate holding the leading edges and keel together at the nose of the glider.

Pitch – Amount of nose up or nose down.

PLF – Parachute Landing Fall, technique used to minimise injury to the paraglider pilot in the case of a hard landing.

Riser – Webbing connecting the harness to the lines of a canopy.

Reflex – An upward bending of the rear of an aerofoil which creates pitch stability.

Reflex Bridle – A line from the kingpost to the rear of the sail which creates reflex in a dive.

Relative Wind – The apparent wind as the glider is flying. Since the glider is always falling with respect to the air around it, the relative wind is different to the actual wind.

Reserve – Emergency parachute.

Ridge Lift – Rising air which results from wind being deflected over a hill.

Roll – Lifting or dropping of a wing from side to side.

Root – The centre of a wing. The keel area on a hang glider.

Rotor – An organised swirl of air behind a cliff face, mountain, building or row of trees. Rotor turbulence is often considered to be the most dangerous kind.

Sink – Falling air which makes the glider lose altitude faster than normal.

Sink Rate – The speed with which a glider descends vertically through calm air. Usually expressed in feet per minute (ft/min or fpm).

Skid – Sliding towards the outside of a turn.

Slip – Falling to the inside of a turn.

Soaring – Extended flight achieved by finding and staying in rising air.

Span – The total width of a glider from tip to tip.

Speed Bar – A device to lower the angle of attack (and therefore change the flight characteristics) of a paraglider. Also a shaped reinforced base bar which allows greater pitch movement in a hang glider.

Stability – Tendency of a glider to return to straight and level flight when upset.

Stall – A loss of lift, usually caused by flying too slow.

Sweep – The angling back of a wing in a planform view.

Tailwind – A wind from the rear or in the direction of flight.

Thermal – A mass of warm rising air which provides lift.

Trailing Edge – The rearward part of a wing.

Turbulence – Gusts or swirls of air that may make it hard to control a glider.

Upwind – Flight heading into wind.

Variable Geometry (VG) – A system which allows a hang glider to change shape (and therefore flight characteristics) by moving the cross bar. Also known as Variable Billow (VB).

Variometer (Vario) – A device which tells a pilot whether his glider is rising or falling relative to the ground.

Washout – A twist in the wings yielding a gradual lowering of the angle of attack from the keel to the wing tip. Helps create pitch stability in a swept wing.

Weightshift – Means of controlling a hang glider by moving the pilot's weight in relation to the centre of gravity.

Wind Gradient – Slowing of the wind as the ground is approached.

Wing Loading – The weight to area ratio found by dividing the weight of the glider and pilot by the wing area. Usually measured in kilograms per square metre (kg/m²).

STANDARD MEASUREMENTS

Altitude	feet	ft
	metres	m
Distance	kilometres	km
	metres	m
Wind Speed	knots	kt
Airspeed	kilometres per hour	km/h
	miles per hour	mph
Rate of Climb or Descent	feet per minute	ft/min
	metres per second	m/sec

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