FLYING FASTER

and

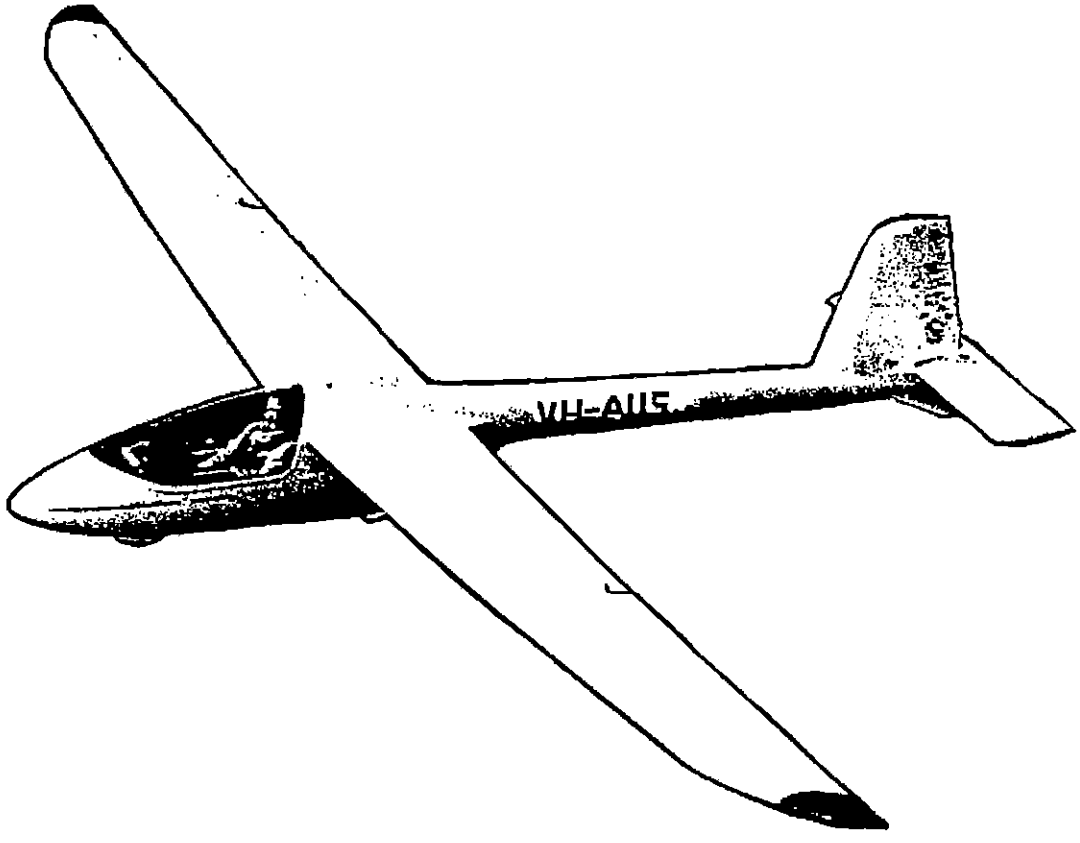
FURTHER

PART 2

BECOMING COMPETITIVE

in GLIDING

Version 2.5 July 1998



Compiled by Maurie Bradney

from

Original and numerous other sources

Maurie Bradney (front seat) as competitor and coach to Dr Hidesake Shimizu at the FAI Nationals at Gawler, 1995.

Foreword for Part 2

There are no additional techniques, tricks or refinements that the competition pilot needs over the ordinary glider pilot. However, competition does introduce some new demands that can be prepared for and developed. While a pilot may undertake a one or two week gliding camp or expedition, it is an easy matter to have a rest day when it is needed.

In competition, rest days are not available except when forced by the organisation or weather. Even then they may not be restful for the pilot. This makes competitions endurance events. The pilot must be able to produce the best effort on every day. This is a psychological as well as a physical workload. Most of this Part 2 is about learning what the relevant factors are and making the necessary training to be able to compete on the most favourable terms.

Competition also gives the need for an additional set of tactical game play. Management of this is more psychological than physical.

Acknowledgments:

While most of the material in this section is original, quite a few people contributed in writing, conversation or simply by being fellow pilots. Some will recognise their work, while others may be hard pressed to find more than a sentence or two of their contribution which may have started out as several pages. In these cases I think that I have retained the concepts that they espoused. Especially when they agreed with me!

Lisa Frank wrote all of the Psychology section. Wendy and Harry Medlicott, Hank Kauffmann and Terry Cubley helped in many areas. Bruce Taylor, Paul Mander, Michael Giles and Brad Edwards also contributed. Vicki de Prazer, Sports Psychologist, Angie Calder and Antony Schache, physiotherapists at the Australian Institute of Sport helped a great deal as did many others of the staff at AIS.

Pictures, drawings and sketches have come from a multitude of sources. Some are original and those which have come from magazines such as "Sailplane and Gliding" and "Soaring" or the internet have been considerably reworked.

This part is still under development. In September 1997 I competed in my first International competition for ten years. I put into action the then current version (V2.4). From that experience I have made some additions and some revisions of content, but essentially the spirit has remained the same.

Maurie Bradney July 1998

Personal Preparation

Once the decision has been made to enter a major competition the next step is to commence preparation.

The place to start is with the pilot. There is more to be gained by polishing the pilot than polishing the sailplane. And polishing the pilot can be done all the time!

It is essential to realise that the focus of effort must be on the skills and factors necessary to achieve the performance and not on the performance itself.

A holistic approach is the best way to integrate the necessary factors into your life. The personal factors necessary for good gliding performance are the same as those for healthy life, so it merely becomes a matter of deciding the particular combination that you need and to organise the time to integrate them.

Overview

In any top level competition you will find that no pilot is markedly better at any of the basic skills. The differences in performance come from the decision making. There is plenty of evidence to show that good physical condition and mental toughness are key factors in making good decisions.

A gliding competition is an endurance event. Only a good standard of physical fitness will carry you through it without any fading off or loss of performance towards the end. The higher standard you have the better chance you have in maintaining your level of competitiveness for the whole competition. This type of fatigue is very subtle. It shows earliest as indecision leading onto poor decisions. If, after reviewing a flight you wonder at some of the silly decisions you made, you may have been a victim of fatigue. There can also be other more direct reasons such as dehydration or low blood sugar. These are under your control and preventable.

Physical Fitness

If you haven't already done so, do Dr Kenneth Cooper's "12 Minute Fitness Test" (see FF & F pt1) or the "Multistage Fitness Test" (Shuttle-run test from the Australian Coaching Council) to establish your current level of fitness. There are 5 levels which are:

Very Poor, Poor, Fair, Good, Excellent.

Most people who are not involved in an athletic sport will test as **Very Poor** or **Poor.** A few will make Fair. If you are Good or Excellent you need do nothing different to what you already must be doing. If you test lower, then you need to work to improve to at least **Fair** and preferably **Good.**

Decide on a programme to suit your needs and put it into action. Any programme needs at least three months to make a noticeable difference so the earlier you start, the better.

The simplest program is walking. It needs to be at least 40 minutes of continuous exercise done 4 to 5 times a week to make improvement. This is between 4 and 5 kilometres distance. If you can take jogging this can come down to 20 minutes as long as it is continuous. Once you are at the Good level, then 2 or 3 times a week is all that is necessary to maintain it. It needs twice the effort to improve than to maintain a level of fitness.

The only equipment necessary for both is good quality walking or cross training shoes, so make the investment. Damage to knees, ankles or feet will be counterproductive and must be avoided. If the shoes are not too bulky they can double up as flying shoes as well, so there is no real extra expense.

This is not a weight reduction programme. It is of no significance for pilots to be at the top end of what is considered a healthy weight for their height and frame. Unless you want to look good in a Tshirt it will be of little value to lose weight. If you are heavier than that, then it may interfere with improving fitness, but that is all. The same exercise will do if you want to reduce but you must increase it to 6 or 7 times a week. It takes three times the effort to lose weight than it does to maintain a fitness level.

Stretching

Competition gliding involves sitting in the one position for between 3 and 6 hours. Most pilots can make themselves comfortable for this length of time, but just the lack of activity does take its toll on muscles and flexibility. As a means to avoid stiffness, aches and pains, a program of stretching should be commenced. Make the effort as it will be worthwhile. 5 to 10 minutes twice a day is sufficient. Various simple stretches are illustrated throughout this document.

Nutrition

Eat the right foods. The 80/20 system works well. 80% fruit or vegetables, 20% protein (meat) is recognised as a balanced diet. Most Australians are way out of balance towards the protein side at something like 30/70! Not so obvious, is that most meats contain fat, so a heavy meat intake means lots of fat too. While fat is high in energy, that energy is not readily available and is usually stored. The result of that is a low level of fitness and obesity which we see around us every day.

Try some Asian cooking and the small portions of meat that they call for.

If you don't already do so, try eating a larger, well balanced breakfast. Some fruit, cereal, (select a low sugar one) an egg and bread or toast. A small amount of meat (fish is better) instead of the egg or as well if you like. Balance this against eating less in the evening. Food eaten early in the day gets processed to be readily available as energy while food eaten at night is mostly stored. All too often as fat!

"Food for Sport" (Heinemann), "The complete guide to food for sports performance" and "Eating for Peak Performance", (both Allen & Unwin) are typical of the many good books on the topic.

At the competition it may not be possible to get anything but "junk foods". With some care, even with these, it is possible to keep a balanced diet. It is essential that any change of diet does not cause a stomach or bowel upset. If you are susceptible that way, have suitable (approved) medication available. If you have a good level of fitness you will get through the two or three weeks of poor nutrition without difficulty.

Food on the airfield and in flight

It can be very hot on the airfield and you can easily be there for many hours before take off. Ensure that you do keep well hydrated in this period. Always ensure that you have plenty of water in addition to your flight water for this time. If you cannot eat lunch before take off, take it with you. Do not miss it out.

If our flights were all under two and a half hours food would hardly be a consideration. Water would be all that is necessary.

The fuel for the brain is blood sugar. The level of this will drop between two and three hours after eating. It will remain below normal unless something is eaten to restore it. With flights longer than this we must eat something to keep our blood sugar adequate for good decision making.

As we are not doing anything strenuous, low blood sugar shows up as indecision, reduced or loss of concentration, bad decisions or even poor coordination. You may recall having some or all of these symptoms? The same symptoms occur if you allow yourself to become dehydrated!

Food which can put a small amount of sugar into the system slowly is the best. It is better to work on a "constant level" system by eating small amounts often.

Fresh or dried fruit can do this. Taking in a small amount of protein as well will help spread the release of sugar over a longer time. Nuts are convenient and effective at doing this, but as nuts are high in fat content, they should be few and the type of nuts carefully chosen. Muesli bars and the like are OK if they have fruit in them. Each variety needs careful checking as many have high sugar and fat contents.

Glucose may be useful if you are going to land within 20 minutes. It gets sugar in to the blood fast and gives the system a good boost. Then that causes the body to make an insulin production response that lowers the blood sugar level for some hours. This effect must be avoided if you still have a longer time to fly.

Water is important. Just a small amount frequently is all that is needed. Do not wait until you feel thirsty. This is a sign that you are already dehydrated! Your needs can be well over a litre. Two or three small containers are usually easier to handle than one large one. The flexible "camel back" type of water containers that are made for cyclists are useful as they can be fitted into almost any space and are easy to use.

Fluid balance is very individual so that it would be a good part of preparation to know what your needs really are. Work from other sports indicates that average needs are 6 mls/kg body weight each 2 hours to be fully hydrated. About a litre each 4 hours for an 80 kg pilot. This takes no account of the effects of heat, altitude or stress. However, it does provide a starting point that we can compare with.

Alcohol

Control tests reported in the BASI magazine just a few years ago related pilot error, as determined by the number of mistakes made by a pilot during a pre-flight check, with alcohol consumption. These tests showed that a quite moderate alcohol consumption substantially

increased the number of mistakes and that *the effect continued for some days after the alcohol was consumed!*

While no pilots drink alcohol within 8 and more usually 12 hours before flight, a significant factor is that the effect may last several days! Many athletes and some pilots, notably Ingo Renner and Brad Edwards have abstained from alcohol in preparation and during a major competition.

To be of any real use this must be done for three months before the competition. This is the period needed to completely remove any substance from the body.

If you don't feel like abstaining, then consume only a small quantity each day. The medical profession has advertised that a maximum of one (750 mls) bottle of beer, or two bottles of light beer, or four glasses of wine or equivalents are unlikely to do any harm and may do some good. As women have a lower tolerance to alcohol, they should have no more than two thirds this amount. This amount is the recommendation for good health and still may be too much for the level of decision making needed in competition. Not surprisingly, an excess of alcohol is also a factor in obesity. Drink less alcohol and look better in a Tshirt.

Drink more water if you feel thirsty. In places where the water can be suspect, drink mineral water, bottled fruit juice or a low joule soft drink. Fresh fruit juice is often diluted with water and if the water is suspect, then so must be the fresh fruit juice.

Sports additives for water

Despite advertising to the contrary, these all have a very similar formula. The early versions (1975 - 85) had too much sugar for our purposes. Current versions are better balanced, but it would be wise to use them at about half to one quarter the recommended strength to avoid a sugar overload. Some fresh research with cyclists and distance runners has come up with the addition of Glycerin BP (available at supermarkets and chemists) at 50 to 25 ml per litre to water or half strength sports drink will improve the body absorption of water and hence reduce the need to both drink so much and urinate. This may be particularly helpful for women pilots.

As all the sports additives contain glucose, this in combination with heat and water bacteria can cause the bacteria to multiply at a tremendous rate. It is an important health precaution to clean containers used for these every day. A special smaller easy to clean container for the sports drink can help make this easy. Use pure water only in your large flexible container.

Drugs

I have not heard of any drugs that can be of use to the competition sailplane pilot. All run out of effect before the flight is over and then can be a considerable safety hazard. Some pilots were reputed to be using beta blockers to counter the effects of high altitude (in addition to oxygen!).

The sporting regulators consider some of the drugs regularly prescribed for common ailments as performance enhancing. Taking these may leave you open to a protest and disqualification. Lists of what is acceptable and what is banned are readily available. If you take any drugs at all check that they are acceptable. The Australian Sports Drug agency in Canberra regularly publishes lists.

Oxygen

Flight regulations state that we should use oxygen from 10,000 feet up. These heights are possible once or twice each competition and are the rule in mountain competitions. Make sure you have it available. A nasal cannula is the most convenient and comfortable. Oxygen is also a useful aid to repair a hangover!

If you are very fit you may be able to go to 12,000 feet with no apparent effect. This may be the case but it really is an illusion. Lack of oxygen in the early stages, is very insidious and creeps in as a feeling of well being. Decisions will be affected by this and they are critical when racing. It is a very sound practise to start using oxygen from 8,000 feet up.

Smoking

If you do, stop now!!. This affects fitness in so many ways that you will ***NEVER*** be able to achieve what may have been your true potential of performance. Smokers should go onto oxygen at 8,000 feet. or lower.

Mental Preparation

There are many things that can interfere with concentration, and so degrade performance.

It needs great mental strength to cope with landing out on the first day and not losing your will to win for the rest of the competition. This is a necessary attribute of the would be champion.

Even in Australia, where competitions are relatively friendly, opposition pilots or crew will make remarks or take actions deliberately calculated to upset you. In international competition this behaviour is often carried to an unbelievable level.

Some defence against these is essential.

If you are a Zen disciple or practice TM or yoga, this will probably be adequate to protect you from these problems.
If not, then some protection needs to be created.
A simple form of non mystical mediation described in
"The Calm Technique" by Paul Wilson (Greenhouse Publications) works well.

A useful on the take-off grid or in the cockpit technique is "Centering".

(See the additional note on this.)

Combined with "Progressive Muscle Relaxation" (described later) or one of the similar forms of relaxation, these may be all you need.

There are many possibilities. The essential thing is to develop an immunity to the occurrences that can happen during a competition to distract you or destroy your competitive will. Practice is needed to have the technique available when you need it, so start now.

Male advantage?

Gliding is male dominated, but as it is one of the few sports where muscular strength is not a requirement, there is no reason why women should not be successful in competition.

Endurance, at the level that we are involved in, may favour women.

As few competition flights exceed 6 hours, urination is not usually a problem in Australia's dry atmosphere but may be so in European conditions.

So far, competition success of women is matched by their relative involvement, which is 8% in Australia. However, with changing social factors, we could see an increasing proportion of women in the sport.

Start Now! and keep a training log

Lifting your physical fitness level takes time. So does learning to use relaxation techniques. Three months is needed to make any noticeable difference. However, it will be worth while, as the improvement will be permanent if you keep a modest programme going. Better fitness will help improve every aspect of your life. Make a simple log so that you can check off your activities each day and give each a 1 - 5 rating. This will also be a reminder to do them.

Nutrition	Exercise	Attitude	Relaxation	Stretching	Sleep quality
1,2,3,4,5	1,2,3,4,5	1,2,3,4,5	1,2,3,4,5	1,2,3,4,5	1,2,3,4,5

Review

Remember, the real area of competition is the flying. That is where the greatest effort of practice and training must be made. Improving your fitness level and mental abilities to be able to keep working at top level are just (significant) factors in the overall performance.

The test and some analysis

⇒ If, at the end of the competition you found yourself improving on each flight, you did not do enough flying practice. Do more for the next competition.

⇒ If you found, that in the last couple of days your performance was dropping off, then you were not fit enough. Work harder on your fitness.

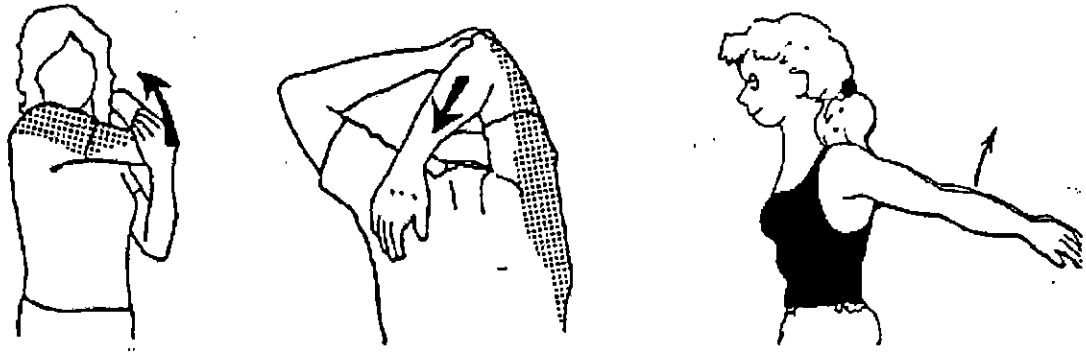
⇒ If you performed badly on one or more days by being spooked by the opposition then the mental preparation was not adequate. Put more effort into this area.

⇒ If none of these was the case, then you have flown as well as you can at your current level.

⇒ If this didn't make you the winner, then you need to work at lifting your performance level.

⇒ Remember, in the top five area there is very little difference in the performance level of pilots. The one who works to get that tiny bit more is usually the winner.

Some arm exercises you can do anytime to help improve passive flexibility.



Australian Institute of Sport: Department of Physiology & Applied Nutrition

Guidelines for pre-hydration strategies in Gliding

Prepared by: Hamilton Lee, B.Sp Sc. & John Smith, Ph.D.

There are a number of ways that you can prevent dehydration during flying. You need also to consider pre-flight and post flight hydration strategies. Here are some suggestions:

1. Water only

2. Sports drink - also provides carbohydrates and electrolytes. The fluid is better retained than water alone.

3. 1/2 Strength sports drink + Glycerol - Recent research shows that glycerol may enhance water retention above that of sports drinks alone

4. Monitor body weight pre and post flights to determine actual fluid loss

5. Also consider using a "Humidiflyers" (trade name) face mask to reduce loss of water during exhalation whilst flying.

6. Skinfold measurements over time may be useful during extended (many days) competitions to monitor body fat changes over time.

Preparation of Glycerol drink: Mix glycerol at 100 ml per 2 litres of drinking fluid (water or 1/2 strength sports drink) or 5% by volume measure (not weight).

Glycerin (glycerol) - Available at chemists and supermarkets. Ensure that the quality is fit for human consumption.

* Please note that the benefits of using glycerol are as yet inconclusive, however to date we have found no adverse effects using the concentration described above.

Recovery

Recovery from what? Most pilots complain of a bad back. They get it from rigging and derigging - they say. Many pilots can hardly walk after a long flight. Recovery will help these pilots get back full mobility quicker. With the right preparation pilots might avoid those problems altogether.

Recovery is a specialist area of sports medicine. For a healthy, functioning athlete the term refers to adaptation to training stressors. This adaptation needs to be physical and psychological in nature and the recovery processes involved are often referred to as restoration and regeneration.

It does need to be considered at the planning stage of any training programme. Its incorporation will help to establish a well balanced programme that is more likely to be adhered to than one without it. The effectiveness of any physical training programme is determined by how well the athlete can recover before the next session.

At the minimal state it is the inclusion of some activities to help recover from the major stressors in your programme and the monitoring (and recording in a log) of key parameters Make a quality assessment wherever possible.
Use a 1 to 5 scale; very poor, poor, fair , good , excellent.
These are:

- Sleep quality
- Morning heart rate

  If you are working on a fitness improvement programme this should reduce slightly over a three month period. Generally it takes three months to achieve any change.
- Weight Check this at the same time each day. This may help you adjust your exercise program. Remember that muscle is heavier than fat.
- Exercise program Note the time spent and type of exercise, quality, if significant.) If you are working on more than one type (walking, swimming, aerobics, stretching) make a separate entry for each.
- Nutrition Consider this in relation to your training programme in combination with your normal worklife. You may need to make changes to get a better result.
- Hydration Give this great attention. Current thinking is that a good deal of poor decision making in the air is due to dehydration. Probably a lot of low quality thinking on the ground has the same cause too!
- Relaxation techniques These should be practised at least twice a week.
- Visualisation Gliding lends itself very well to this technique. This should be done at least twice a week.
- Make allowance for some non specific relaxation; reading, watch television, or some such at least once a week.
- Sport specific practice. In our case flying. As well as the time, note the type, (lone cross country, group flight, one on one race or whatever.) Note the quality or placing. A useful recovery after flying is to walk or do light exercise or stretching for 5 minutes.
- Record each day how you **feel** about your training. Very poor, poor, fair, good, excellent. Feeling tired after a training session (of any sort) is normal, but a continuous tired feeling would indicate fatigue or poor recovery.

Extending this a little further, you may find that you need to do some specific recovery exercises. Typically, if you find you get back pain from flying or exercise, some massage or other treatment will be useful. Similarly, if you tend to tense your legs or arms. After some time, you will probably find that you need to modify it to include more recovery items. Use showers or spa baths after exercise. Consider alternation of hot and cold to help recovery.

Prioritise all weekly commitments (work, study, training, domestic chores, social). Add a variety of recovery activities around these commitments such as massage, swim, spa.

Do not wait until you are in a competition before you get concerned about good quality sleep. Put the following tips into practice.

1. Practise relaxation techniques before going to bed.
   (relaxing music, muscle relaxation, breathing exercises, visualisation)
2. Lie down to sleep ONLY when you are sleepy.
3. If you don't fall asleep within 30 minutes after turning out the light get up and do some relaxation work (see Point 1)
4. If you wake up in the night and can't go back to sleep follow Point 3.
5. Reduce thinking and worrying in bed - learn to switch off.
6. Get up at the same time each day even if you have a late night.
7. Things to avoid in the evening
   1. Caffeine (eg. coffee, tea, coke, chocolate) 2.Nicotine
   3. Alcohol 4. High protein meals (reduce the amount of meat)

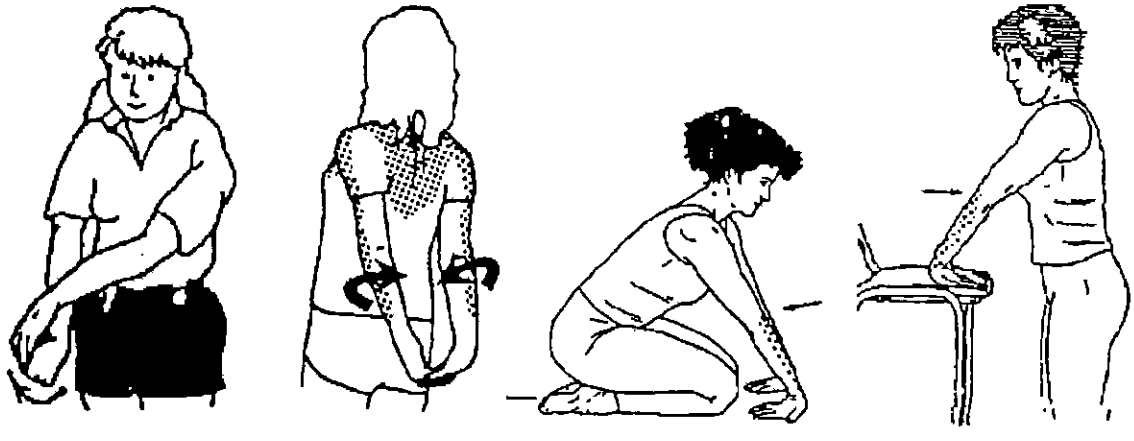
Stretching exercises to improve static passive flexibility

Because glider flights involve sitting in the one position for a considerable time pilots will have problems with muscle stiffness, cramps and the like. Stretching of the parts most affected can alleviate this and a well practised program can possibly avoid it altogether.

To make the best use of these the exercises should be done frequently.

⇒ Stretching will be facilitated if preceded by a 5 to 10 minutes of light aerobic activity.
⇒ The stretch position is assumed slowly and gently.
⇒ Hold the position for 15 to 30 seconds.
⇒ Move further into the range as the stretch eases.
⇒ Stretch before and after flying.

Diagrams of various suitable stretches are shown throughout this publication. Select some that exercise the neck, lower spine and legs and do them regularly.



Sport Psychology 1

Stress coping strategies

Relaxation techniques can effectively reduce stress, either generally in your life or in specific situations. If you regularly practice relaxation you will notice the benefits in your everyday life and will be able to manage a particularly stressful situation more easily. In gliding, relaxation techniques may be used as preparation for demanding flying and at critical times while flying.

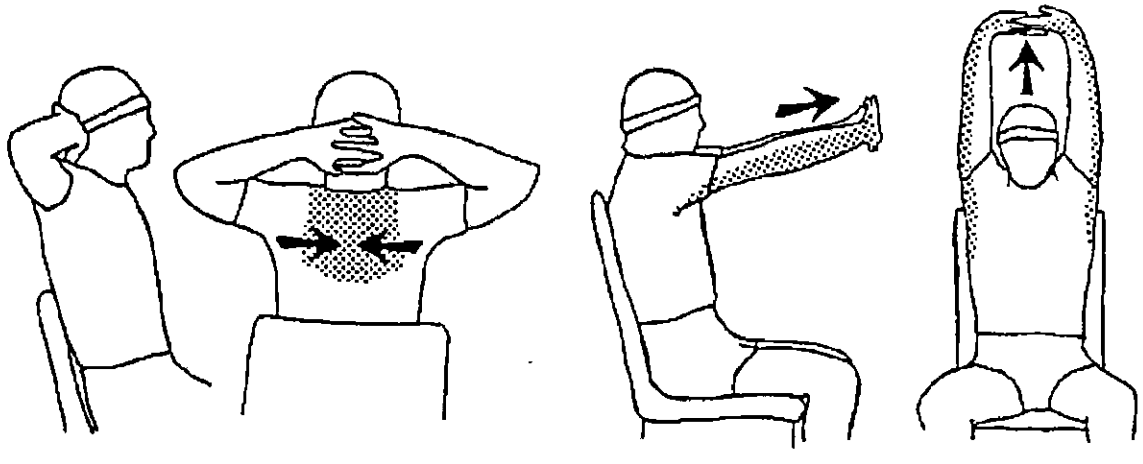
The most common features of stress are muscle tension, sweating, headache, shallow breathing, increased heart rate, feelings of anxiety, poor concentration, and fatigue. The relaxation response induces reduced heart rate, decreased rate of breathing, decreased muscle tension and a feeling of peace and contentment.

The two main relaxation techniques are progressive relaxation and meditation. There are long and short versions of both of these methods. You might use a long version on a daily basis as part of your routine and apply the short version on occasions such as waiting on the airfield to launch or even in the air.

During a gliding flight, a short version of a relaxation method might be used to monitor and to trigger relaxation with minimal effort. To be able to apply relaxation techniques effectively in the air you will need to practice relaxation on a regular basis. You will become practiced at relaxing your mind and body if you have a daily routine of the long version of progressive relaxation or meditation. After a period of practice you will be able to trigger relaxation by simply scanning tension and need not work through the long version in detail.

Try to set aside 10 minutes a day to relax. You will find it easier to focus and relax the various muscles with practice. In time, you may find that you no longer have to tense the muscles first, but can simply release them to feel a sensation of relaxation flowing through your whole body.

Some spine and arm exercises to improve static passive flexibility.



Progressive muscle relaxation

1. First adopt a comfortable position. It may be sitting in a chair, on the floor or laying down.
2. Take a deep breath in, let it out slowly, and focus your thoughts on your body.
3. Now tense the muscles of your toes and feet, hold for several seconds, then let them relax completely. Notice how the muscles feel heavier.
4. Move to the lower legs and repeat this tensing/relaxing routine. Now do the same thing with the muscles of your thighs.
5. Now clench and release your buttocks. Then move to your back muscles.
6. Allow your fingers, hands and arms to relax in turn, and then move up to the shoulders.
7. Focus on your neck, scalp, jaw and forehead. Don't forget to include the eyes and face; you may be surprised how tight those muscles are.
8. Finally, focus on your whole body once more. Use your imagination to visualise any residual tension 'draining away' down your body, into your feet and away.

Meditation

Meditation is a mental experience rather than a physical technique. It can create a sense of fulfilment and contentment, and involves making your mind as 'still' as possible.

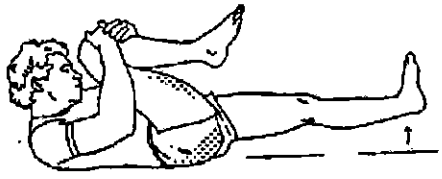
1. Find a comfortable position.
2. Relax physically using progressive relaxation.
3. Still the mind.

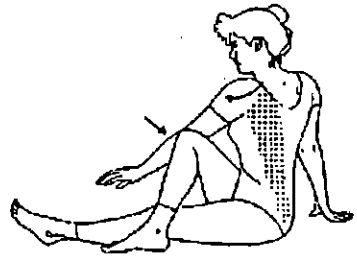
   -focus without analysing your thoughts or actions

   -focus your attention on one thing such as your breathing

   -observe, and concentrate on observing, without reacting; let sounds, thoughts, feelings come and go, like waves rising and falling

Some exercises to improve spine flexibility.



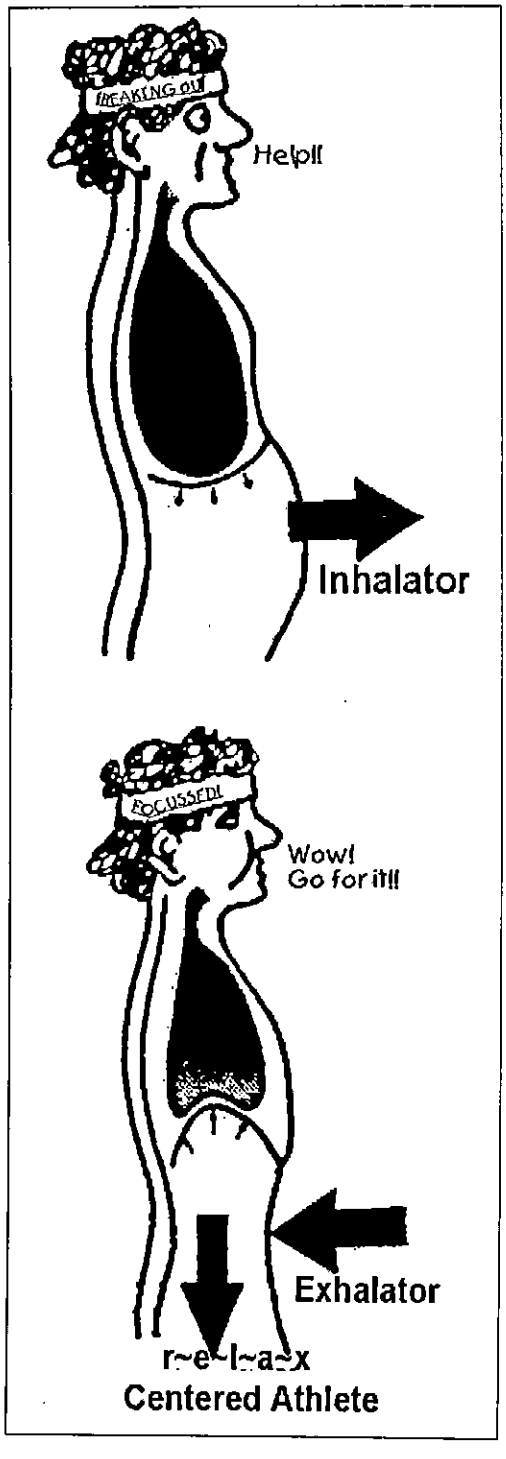


Centering Procedure

A different type of centering to that which glider pilots expect!

1. Stand comfortably with your feet shoulder distance apart and your knees slightly flexed. This is similar to a seated cockpit position!
2. Consciously relax your neck, arm and shoulder muscles. Smile slightly to release the tension on your jaw.
3. Focus on the movement of your abdominal muscles. Notice your stomach muscles tightening and relaxing.
4. Take a slow, deep breath using the diaphragm. Notice you are extending your stomach.
5. Consciously maintain the relaxation in your chest and shoulders. There should be minimal chest movement and absolutely no hunching or raising of the shoulders.
6. Exhale slowly. Let yourself go. Feel yourself get heavier as all your muscles relax.
7. Do this two or three times.
8. Focus on your job right now. Use your training to find your correct focus point.

You can even do this in the cockpit while you are waiting for take off or at other times



Seven Steps to your own competition training programme

Preparation for an important competition, such as a Nationals or World Competition, may be a plan that covers one season or many years. This can be conceptualised in 3 stages. Planning, Practice, Implementation. This is about the first stage - Planning.

Step 1

Start with your goal. Write it down. Almost certainly you will find that you need to have ***intermediate goals*** so write them down too. Then work to the present. Consider then if it is reasonably possible in the time available. It may be that you need to modify the goals or time scale. If there are a number of, "I must place well enough to move to the next step" situations, then these will provide review steps to modify the goals or time scale as you go.

It is essential to realise that it is not the goals themselves that need to be the focus of effort, but the skills and factors necessary to achieve those goals! If you put the maximum efforts into those factors, and you have the innate abilities, the goals will be realised.

Your activities outside of gliding will all be affected to some degree. You must make adequate room for these to be accommodated or incorporate them into your gliding life. You may even decide to shift your gliding goals further into the future while you concentrate on a profession, partnership or making the first million dollars. A plan can still be made.

Step 2

Discuss your primary goal with the person(s) this will affect the most. Hidden agendas are great destroyers of friendships and relationships. Have your agenda out in the open and you will get the maximum amount of support.

You may wish to be modest about it to the extent of saying "win a place" rather than "win" or some less ambitious goal. Even if you think you are acting alone, make the effort to discuss your primary goal with someone. The practice and preparation will become a large part of your life and is bound to affect everyone you associate with in some way.

Step 3

Make a broad financial study for your plans. If it looks reasonably viable the detailed analysis can come later, but do not forget to get to the details with adequate time to take action. It will be of little use to be fully prepared only to find you cannot afford to get to the competition. The general study may show that you will need financial assistance and the search for that will become a part of your preparation.

Step 4

Make provision for feedback of your progress. This is best done by bringing a coach into your plans. In addition, start a cooperative group for both flying practice and discussion. If your usual place of gliding is at some distance from where you live and work, these may be different people. It will be best if none of these are direct rivals, but as talent is short and the need for good quality practice is high, you may need to include such people.

Step 5

Review recent past performances in the light of future aspirations. Now you are ready to make a detailed list of the major skills and factors you will need to consider.
If you haven't already done so, check through the other chapters, particularly "Personal Preparation" and "Analyse your Strength's and Weaknesses" and make a list of factors specific to yourself and your goals.

Use the six divisions in the chapter "Pilot Improvement Programme"

Strategic Technical Organisation Mental Physical Practice STOMPP!

Strategic: Collect;	Maps for the competition area(s)
	Relevant weather information
	A history of other competitions at the same site(s)
	Travel information
	Accommodation availability
	What else?
Technical: Find;	Accurate performance data on your sailplane type(s)
	Study again all available meteorology books.
	Be sure you can understand all your instrumentation
Organisation: Find out;	Selection requirements
	Crew requirements
	Team requirements and organisation
	Your own finance available for this project. Include future projections.
	Is financial assistance available from: team, association, club, family, company, sponsorship?
	What support equipment is needed?
Mental: Continue or start;	Visualisation
	Progressive muscle relaxation
	Meditation
Physical: Continue or start;	A physical fitness program
	Examine your nutrition needs. Make reforms if necessary
	Check any medications are sport acceptable.
Practice: Make a plan;	To fly regularly
	Fly with different wing loadings
	Work on an improvement programme for flying skills
	Commence a detailed analysis system for every flight.
	Get competition practice (possibly intermediate goals)
	If possible practice at the competition site

Expand each of these areas into as many sub areas as you think are necessary.

What about the non gliding part of your life?

Separate the ones that you cannot control. You will at least have to keep yourself informed about them and any changes that occur to them. Then construct a time line or calender and place the significant events on it. Work through it in detail to get a weekly programme with daily items. If you can work with gantt charts they are excellent for this type of project planning.

The various sections of FF & F will help in identifying the details of each area. You need to note your needs of each and get them onto your action plan. FF & F is designed to give the starting points and guidance for all gliding areas. The personal ones you must sort out for yourself.

Before going too far on the planning process, take a long, hard look at yourself. Now is the time to be very honest. To embark on a project that will impinge, if not dominate, every aspect of your life for 4 to 10 years is a major undertaking. Review every aspect in this light.

Step 6

Commence a training log. This needs much more than just your flight log. A diary of at least a week to an opening is needed, and possibly a page to a day will not be too much.. Alternatively you could use a computer. If possible use a database, as that will allow analysis once you have accumulated a significant amount of data. As well as being a reminder to keep at your planned programme, it will show trends that will allow you to refine your programme.

If you have taken on a diet you will need to log this too. The computer diet programs are quite good in tracking whether you are getting sufficient amounts of the various vitamins and minerals. Some of these also have provision for exercise and the overall effect that the combination should have on you.

See the section on Recovery for details of a physical training log.

Provide somewhere to log feedback. If you can regularly get this from a coach, great! Make sure it is detailed enough for your guidance. Your flying and discussion groups can help here too.

Step 7 Start Now!

Analyse Your Strengths and Weaknesses

It is natural to assume that any pilot who enters a competition hopes to win. It is almost a certainty that if a pilot enters without that intention and hope, then they will not win. A positive attitude is essential. However, a realistic appraisal of the possibilities is needed to ensure that those expectations are realistic relative to the occasion.

Remember, it is the skills and factors that create the winning performance.
The performance itself is the cumulation of them.

Some examination of these factors is necessary to decide which you can control and work on and those which are outside your control and hence can be put aside. Some of these are of a strategic nature. If you are planning for a competition closer than 6 months you may not be able to make a large difference in some of them. However, just starting on them will be of some assistance.

If you are not flying in competition, but simply trying to improve your performance you can use the same analysis.

Internal things we can do something about. External items we cannot affect and hence should not worry over them. The pilot needs to learn to quickly identify and discard external items. This will than allow more power to be applied to the internal matters. These are also the items that can be included in training and preparation.

Here are some items that have been identified as being of concern in flights.

You may be able to add to these?

Internal Thoughts	**External**
Pre flight	**Pre flight**
Psyching by opposition pilots	Crew relationships (not pilot - crew)
Dealing with pressure	Information from home
Confidence	Media
Currency	Previous experience in likely conditions
Mental preparation	Where am I placed?
Belief in weather forecast or own analysis	Family and other catastrophes
Expectations from task	What other pilots are saying (not psyching)
In flight	**In flight**
Stress	Information changes new forecast
Tactics	What others are doing
Mistake management	Radio others
Wondering what others are doing	Performance??
Concentration	Information from ground
Doubts about weather/situation	
Confidence	
Annoyance with some person, item	
Perseverance determination?	
Senses	**Environmental**
How do I feel? body comfort?	Weather! actual v's predictions
Relaxed? Tense legs, shoulders, neck, hands?	Clouds
Airflow	Terrain
Visibility	Visibility
Drink	Gaggle behaviour? What standard?
Food	
Radio information	
Perception of performance	
Response of aircraft	

Listed are items that you can do something about.

Give yourself a 1 to 5 score on each of the following factors. If you consider a factor to be irrelevant to the particular competition or situation, then give it a 3 score. There are 20 factors to give a 100 maximum so you can think of it as a percentage factor if you wish.

Currency, flew yesterday, last week, last month?	❑
Recent competitions. Last summer, each competition is 1 point	❑
Annual flying. 100 hours/year gliding count 2. Add 1 for each 100 hours/year.	❑
Competitive sailplane, equal to the best in the class? If so count 5.	❑
Experience on type, totally familiar? 80 hours for this with 40 this year count 5.	❑
Instrumentation, adequate? Can you use it easily?	❑
Aircraft preparation, nothing more you can do?	❑
Crew, support equipment, practiced, working well?	❑
Competition type and or venue compatible with your experience??	❑
Overall weather knowledge. ***No pilot knows enough***! (less than 5)	❑
Site knowledge, flown there before? Often? Never?	❑
Practice at site, nearby or similar. (Before the comp.)	❑
Environment at site, helpful to you?	❑
Anyone in the opposition who concerns you?	❑
Psyching by opposition? Your ability to cope?	❑
Are you well practised with one or more relaxation techniques?	❑
State of fitness, can you take a month's hard flying, no worries??	❑
Self monitoring, how good is your ability to adjust?	❑
Do you have a good confidence level about this competition?	❑
Choose one additional factor, favourable or otherwise.	❑
Your score overall?	= ___ %

Having done that, now get someone who flies with you regularly (either in the two seater or competing on the same tasks) to score you. Alternatively, a coach who knows you well can do this.

Compare their result with your own. You may be surprised to find their results are quite different. Combine them and you will have a list of the factors that you need to work on.

This analysis can give direction to your training program. It should be repeated at intervals as a check on positive progress.

A coach can also help as a source of information, by giving direction to your efforts and providing feedback on your improvement programme.

The best practice for competition flying is competition flying. No other flying creates the competitive pressure.

A problem in training for a major event is that there are rarely enough competitions at convenient times to provide the best training. Always fly with a companion. This provides a continuous check on your own performance as well as the chance to improve. Not only does it provide competition, but also gives training for team flying.

One feature of a gliding competition is that each day is a fresh new chance to win. Yesterday's result does not influence today's except in our own mind.

It does need mental discipline to remember this and act on it.

It is difficult to isolate something like a bad score from a land out as history. This also applies during a flight. Whatever has been done is already history, and need not interfere with what you have yet to do in that flight. Fly the best you can each moment and keep doing it for the whole flight. Competitions are won by being consistent.

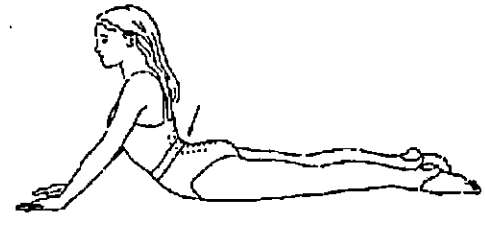
A powerful positive factor to avoid is distractions. It is too late to argue about some aspect of the rules, task setting, or some failure of the organisation. That must be put aside and argued for the next competition.

Equally, we can try to put aside personal and business distractions.

All concentration must be applied to the current task, under the current rules.

Being able to use a relaxation technique is the best way to meet problems and distractions.

More exercises to improve lower back flexibility.



Pilot Improvement Programme

This programme is an overview of the factors that must be considered if you wish to lift your standard of flying. Accurate information about strengths and areas of potential improvement, combined with realistic goal setting practices increase the likelihood of achieving those goals.

Gliding is an experience sport.
Nothing will improve your gliding more than time in the air.

This is probably why Ingo Renner, four times world champion, with more than 23,000 hours of high value cross country gliding, is so difficult to beat.

"The more I practice the more I get lucky" attributed to Jack Nicklaus is just as true of gliding. However, we can do lots more to make sure good gliding is not brought down by silly, preventable mistakes.

The management of stress has come to be recognised as one of the most important skills a sports person can have. This must also take a high priority in your programme.

While the approach is holistic, for convenience, development can be viewed 6 areas
. *STOMPP!*

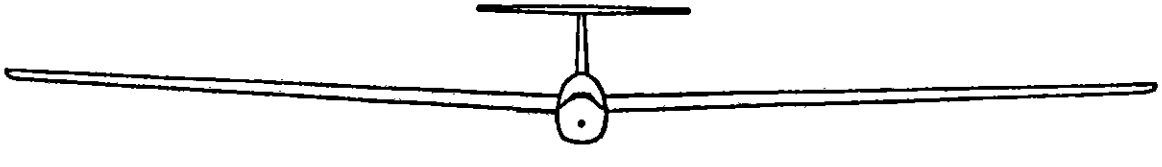
STRATEGIC TECHNICAL ORGANISATION MENTAL PHYSICAL PRACTICE

Because our equipment is so important to the overall result, **technical** can be divided into; (a) personal knowledge (b) sailplane and equipment preparation.

There is inevitably some overlap between the areas. It is impossible to discuss physical development without touching areas of mental approach and strategic plans. Similarly some areas of technical must also flow into strategic considerations.

Development of skills takes time so that it is useful to plan in short term and long term goals. Typically this could be, what can be done for the next local competition? (short term) and what can be done to achieve a place in the next Australian Team? (long term). A series of short term goals along the path to the main goal works well as it provides rewards and encouragement as you proceed.

If the next World Competition was at a totally unsuitable site for Australian experience, then the long term goal could be either to expand experience to include the site or to miss that and plan on the following competition. **Goals must be realistic, not pie in the sky stuff.**



Listed are 25 relevant factors. Add others if you feel they are necessary

⇒ **STRATEGIC:** site knowledge, recent competition experience, practice at the site or similar.

⇒ **TECHNICAL:** (a) personal knowledge; currency, experience on type, total experience, overall weather knowledge.
(b) sailplane; competitive type, instrumentation, sailplane preparation, support equipment.

⇒ **ORGANISATIONAL:** sailplane preparation, planning for a competition, crew, crew training

⇒ **MENTAL:** confidence level, ability to adjust, self monitoring ability, ability to relax, who is the opposition? psyching by the opposition.

⇒ **PHYSICAL:** state of fitness, current health.

⇒ **PRACTICE:** do as much as possible.

Make a training diary

A gliding log book is not enough. You need a separate book to keep notes on your whole preparation programme. A week at an opening diary is suitable, either in a pocket or A3 size.

In the planning areas you can write up your training programme, and enter every aspect of what you are doing about improving. Physical, Mental, Nutrition, Technical reading or courses and so on. Do not leave a single thing out. If you are working with a coach or mentor, get them to give advice and make comments.

Work with a Coach

When comparing gliding with other sports, one of the conspicuous absences is coaching. People in other sports think coaches are essential. Pilots aspiring to improve can do so far more rapidly and cost effectively by working with a coach. Other sports have proved this.

Feedback: from a Coach, Mentor or one or more pilot partners.

It is essential that some means of getting feedback on your progress is built in to the programme. Also, you need to learn how to use this feedback. The following principles ought to be adhered to when receiving feedback.

Listen, rather than immediately reflecting the feedback or arguing with the person providing the feedback. Then take time considering the points raised.

Often, our first reaction to hearing something said about us or our behaviour (particularly if we perceive it as criticism) is to deny the correctness of it in order to protect our ego. In doing so, we lose an opportunity to learn from the information.

Because we tend to be sensitive to the evaluation we receive from others, it is easy to "project" our fears of what people might think of us onto the person providing the feedback. For this reason it is important to clarify what it is that the feedback provider is actually saying about us or our behaviour. This can be done by checking our perceptions out with them. That is, ask, "do I understand you correctly? or are you saying...?"

Feedback can reflect, in part at least, a bias of the person providing it. However, it may still be quite valid. Listen carefully and check out the parts you are doubtful about. One way of obtaining a more accurate picture of our behaviour is to seek more than one opinion.

At the same time you can take advantage of the opportunity to obtain information on other aspects of your performance, not just the items that the feedback provider wants to talk about.

It is appropriate for a coach to decide to give you feedback on an element in order to bring about a change in that behaviour. This is also an opportunity for you to obtain information that might help with regard to changing another aspect that is of concern to you.

Decide on a course of action based on the feedback received.

Feedback is the cornerstone of the planning stage because the effective use of feedback is necessary to update the goal setting process.

Once you have identified an element that can be improved, and have decided on a course of action to bring about the improvement, a timetable or schedule can be devised and implemented. You can then reward yourself for sustaining this commitment.

Goal Setting

Goal setting is a very useful tool to employ for any improvement program. It is better to have a series of minor goals that can be met rather than to have one major end goal. If the end goal is failed, but most of the minor goals are met it allows some sense of achievement to be maintained, and may prove a useful analysis tool.

Goals must be:
⇒ Specific
⇒ Measurable
⇒ Affirmative
⇒ Realistic
⇒ Target timed

Informal Coach and Pilot Interactive Sessions

With a group of 3 to 15 people, there can be a lot of value achieved by conducting an informal discussion, rather than providing a lecture. The coach will need to provide guidance and sometimes direction, but in general, pilots will attack any reasonable topic with relish. The results can be beneficial to all.

It is essential that a board be available to put a summary of the groups findings.

Suitable topics are:
What are your worst and best cross country experiences?
Where do you get information from in flight?
Dissect a possible scenario - a what if? situation.

Gliding Training Flight Analysis

Specify a technical skill or Goal for this flight. _____

Specify any secondary goals _____

Skill	Evaluation for this flight				
	Very Poor	Poor	Satisfactory	Good	Excellent
Numeric Score	1	2	3	4	5
Technical Quality					
Blocking out of Distractions					
Effective control of Emotions					
Quality of Preparation					
Quality of Decision Making					
Concentration during Flight					
Effort					
Willingness to Learn?					
Selection of Information					
Communication					
Flight Goal					

What were you most satisfied with in this flight? _____

_____

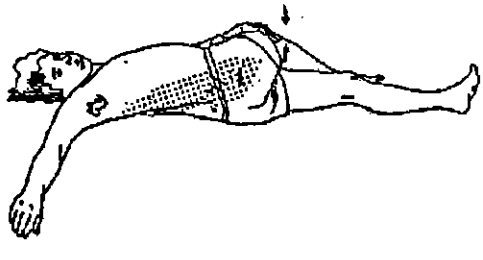
What were you least satisfied with in this flight? _____

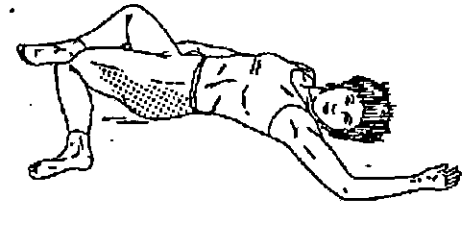
_____

What will you do to improve? _____

_____

Some exercises for the lower back.





Detailed flight analysis.

The GPS log, either direct or via a datalogger, can provide a detailed analysis hitherto not available to glider pilots. It can now allow us to collect statistical data akin to that of cricketers or footballers.

Perhaps we may not want to get that detailed, but with only a few points separating placing in a two week long competition, even a tiny improvement is worthwhile. It may reveal fundamental errors that can give a quantum level of improvement, or as a minimum confirm that a pilot is doing most things correctly. This latter can be a confidence builder that in itself will give some improvement of performance and so is worthwhile.

Simple electronic varios give a ratio of time thermalling against total thermal time. This is a very basic measure and needs a lot of interpretation and additional data to be useful.

Gliding is a very complex sport. (Which is its attraction for many.) We cannot expect to immediately achieve the analysis of simpler more fixed location sports that have over 100 years of history and development behind their analysis. Commencing is just a small step in creating a logical analysis to use for a pilot improvement programme.

In addition to the obvious obtainable from a barograph from the datalogger we can get:

- Position where we contacted each thermal
- Distance and time interval between thermals
- Number of circles in each thermal
- Time and size for each circle
- Wind drift and countering behaviour
- Off track diversions
- Turn point behaviour
- With some use you will think of many more items, perhaps some that are of much more use than these listed ones.

The logging options may need to be adjusted in order to get this amount of detail but it will be worthwhile. You will need 4 or 5 second recording intervals. If your equipment cannot do this, then if you are a serious competitor, you must consider an upgrade. You will also need access to a PC to download and view the data for analysis.

With some additional information (reason for the off track diversion - good cloud or street, other glider, whatever) further analysis can be made and the whole flight can be broken down to a number of basic performance measurements.

◊ Thermal strength range - average - low & high
◊ Climb height gains per turn and thermal - low & high
◊ Height range for flight
◊ Missed thermals
◊ Caught thermals
◊ Second bite thermals
◊ Recentres
◊ Low saves
◊ Following? Leading?

The concept is new to gliding. However, gains have been made in almost every sport by such detailed analysis. We will not get far into this analysis before significant improvement will be evident.

After a number of flights from the one site we may be able to find positions where we consistently find thermals. This can allow us to develop a thermal map of the area. Having this exclusively in a competition could be a winning advantage!

Competition Preparation List:

Mark items that are fully prepared or need attention. Cross out those that do not apply. If you are working with a team or coach forward a copy to your team captain or coach. Do this at regular intervals (each month or more often) up to the competition date.

Pilot _____ **Competition** _____

Site _____ **Practice starts** _____

Class _____ Sailplane _____ Handicap? _____

Insurance due date? _____ Form 2 due date? _____ Ballast system O K? ❑

Your weight? _____ Cockpit gear? _____ Oxygen system available? ❑

Min cockpit weight? _____ C of G for you? ❑ Sailplane Seals? ❑ Instruments OK? ❑

Flight equipment: Parachute repack? ❑ Oxygen filled? ❑ Cameras, new battery? ❑

Films available? ❑ GPS Checked? ❑ Turnpoints entered? ❑ Software setup? ❑

Maps WAC ❑ Survey ❑ Road maps ❑ Planning equip ❑ Apparel ❑ Uniforms? ❑

Ground equipment: Car ready? ❑ Trailer checked? ❑ Base radio ❑ Battery charger ❑

Ballast loading gear? ❑ Glider moving gear ❑ Electrical Plugs ❑ Baro/datalog charger ❑

Competition requirements: Entry ❑ Accommodation ❑ Comp Licence ❑

Crew arrangements firm? ❑ Travel ❑ Passport ❑ Visa ❑

Personal targets: Diet ❑ Exercise ❑ Alcohol Abstinence? ❑ Mental preparation ❑

Technical knowledge? Site ❑ Local Met ❑ General met ❑ Technical, glider ❑

Flying preparation: Hours on type? (Min 40) ❑ Competitive practice? ❑

For team coordination, list the types of equipment.

Vario 1 _____ Vario 2 _____ Radio _____

GPS type _____ Data logger type _____

Sailplane Preparation

If you need to do anything major with the sailplane begin well before you need the machine for competition. Maintenance is notorious for taking much longer than you estimate. Here I will cover only minor aspects of preparation.

Airframe: Give it a through clean. Examine the leading edges of all surfaces. If there are any small chips in these areas they should be filled, as they are in the most critical area for performance.

Use silicone wax remover to make sure the area to be fixed is really clean and you will get good adhesion. Fill with gel coat (or with whatever finish has replaced it) using a spatula.

Sand off very carefully with fine wet and dry paper. Use it wet. You may need to do a final finish with cutting compound so the fillings are invisible. When all repairs are done, polish the entire airframe with a plain wax. Solid wax put on with a machine polisher is best, as it melts into any tiny holes. Then finish with a lambs wool buff.

After this is done all it needs is a clean with a moist chamois. Wax finishing once a year is enough unless you fly very frequently all year.

Control Surfaces: You may have to remove some wax from these areas to get good tape adhesion. Use the sealing system recommended by the makers. Take particular care to make sure control movement is not restricted or stiffened. If it is, strip off the tape and start again. It is essential to get this correct as poor control surface taping can have a major effect on handling as well a performance.

Bug Wipers: These are usually not needed in Australia. In some countries they are essential to performance. Consider them if you are taking your sailplane to a European competition.

Canopy: Good sealing around the canopy can give the greatest benefit in reducing flight noise. It is easy to tack a thick wool thread at 5 cm intervals with contact. This is quite effective.

A silicone seal is good but is very difficult to do well. It will also alter with temperature and can distort the frame. The silicone must be put on as a very thin, even strip.

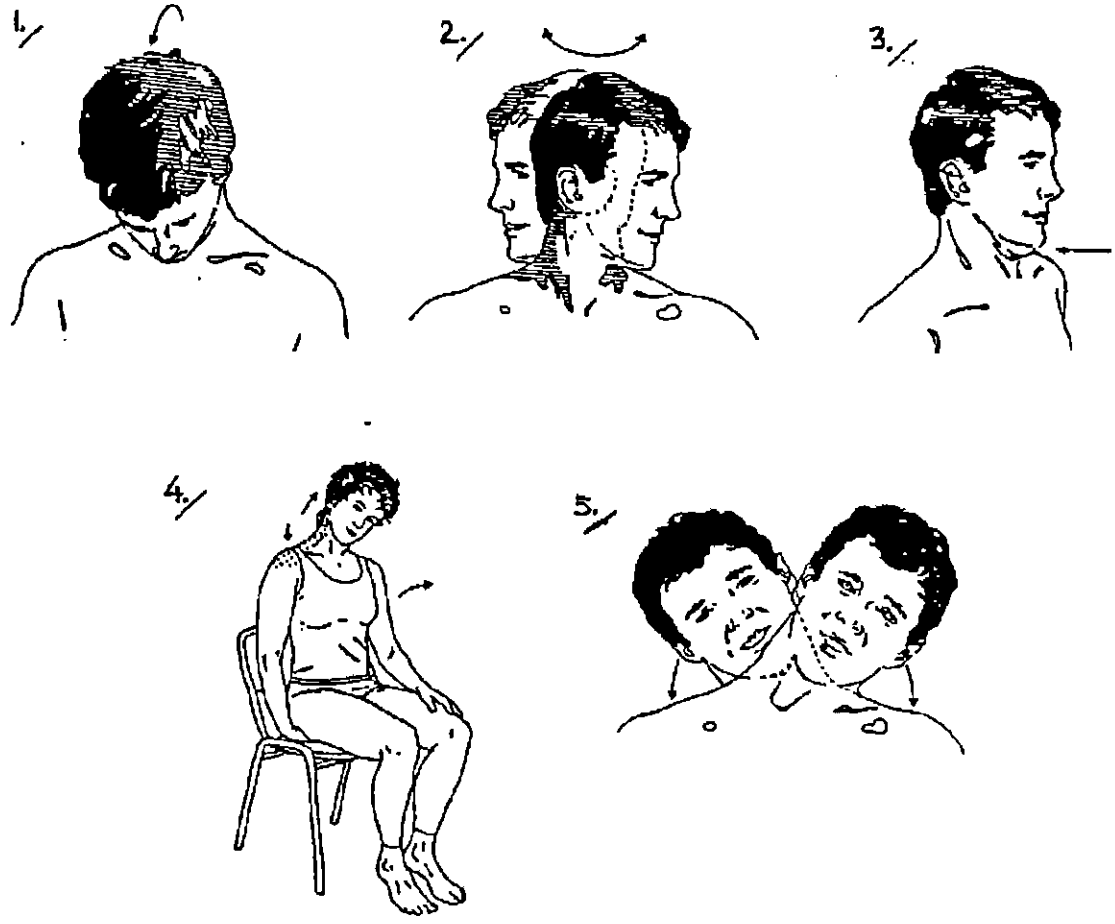
Between these two is a foam adhesive strip. It is easy to attach and can be very effective.

Wheel Doors: Check these and adjust if necessary to get a good fit. Replace any worn bungies or springs.

Gaps: Cover all junction gaps with tape. Electrical tape will be necessary if there is any three dimensional stretch. Otherwise use cloth tape. Tessa brand is best for both.

Electrical: A dual battery system is a must. Each should have its own fuse at the battery. Good quality wire of the correct load capacity, with appropriate switches and fuses for each instrument, helps keep the system safe and reliable. As with plastic tubes, you must neatly tie and bundle electrical wiring so it will not foul as you get in and out.

Some neck exercises you can do while waiting for the traffic lights.



Instrument Preparation

Although you may not be setting up your own sailplane or making major instrument changes, there are still plenty of things you can do to ensure instrument function is correct and reliable.

It is worthwhile to spend some time with instrument handbooks so that you can fully understand what information the instrument can provide and how to get that information.

The two key instruments, the ASI and thermalling vario should be together on the top row. If there is room, the speed director should be on the top row also. If this is not possible, then on the next row down with the distance/height readout.

Sometimes it is possible to move instruments about without altering the system. Altimeters and radios which need little attention in flight can be lower on the panel.

If you cannot change a less than ideal instrument placement then accept that you must work harder at scanning. You will be at a small but constant disadvantage to pilots with a more efficient instrument layout.

The instruments must all work correctly. To do so there must be no leaks in the system. There are schemes and equipment for checking this. This should be done before any competition.

Do not assume that because you checked it when it was installed that it will not leak two years later. Plastic tubing hardens with heat and age. After a few months in service just the tiniest disturbance can cause a leak. Even small leaks can cause significant delays in instrument response and incorrect readings

Tubing should be positioned so it cannot be fouled by the pilot getting in or out. Whenever you shift instruments, use new tubing. This can be done many times over for the price of one unnecessary retrieve. Simply replacing all the tubing in the cockpit area with new tubing is worthwhile. This is not possible, or even necessary for the tubing runs that go from the cockpit area to the rear fuselage. These are reasonably protected. However, do check that tubing in the sidewalls or immediately under the seat cannot be fouled or squashed by control movements or G loads.

Some simple flight checks can be made on instruments. Try flying the sailplane in a gentle slip and see what difference it makes to the ASI and the varios. Then try the same with a gentle skid. Most varios will read half to one knot difference (usually higher) with some slip on. For those who believe in flying slipping turns to thermal better, this is an important check to make.

Even electronic varios have significant lags. You can check the time lag of your vario by joining at or near the same height, another glider that is well established in a thermal. Preferably one about 4 to 6 knots so that the height gains are obvious each turn. As you approach the other glider, note but do not act on your own vario reading and simply join by formating on the other glider.

Check the time it takes from the time of commencing to circle to the time when the vario has a steady reading. It may take a few tries, but knowing the real lag of your vario is a valuable aid

to efficient thermalling. Knowing this will also give you great confidence on those very difficult broken thermal days.

Sometimes it is better to install a gust filter (a rigid small volume, such as a petrol filter) in a venturi line and sometimes the pitot line to an electronic vario or fast response mechanical and operating it on the fast setting rather than using a slow or damped setting.

It is worth some flying with and without this to check which allows you to use the instrument better. This is particularly so for the vario you use to centre thermals with.

The compass is an often neglected instrument. It is sensitive to electrical fields as well as the earth's magnetic field. A compass swing is a must to ensure that it is working correctly or at least to know what its errors are.

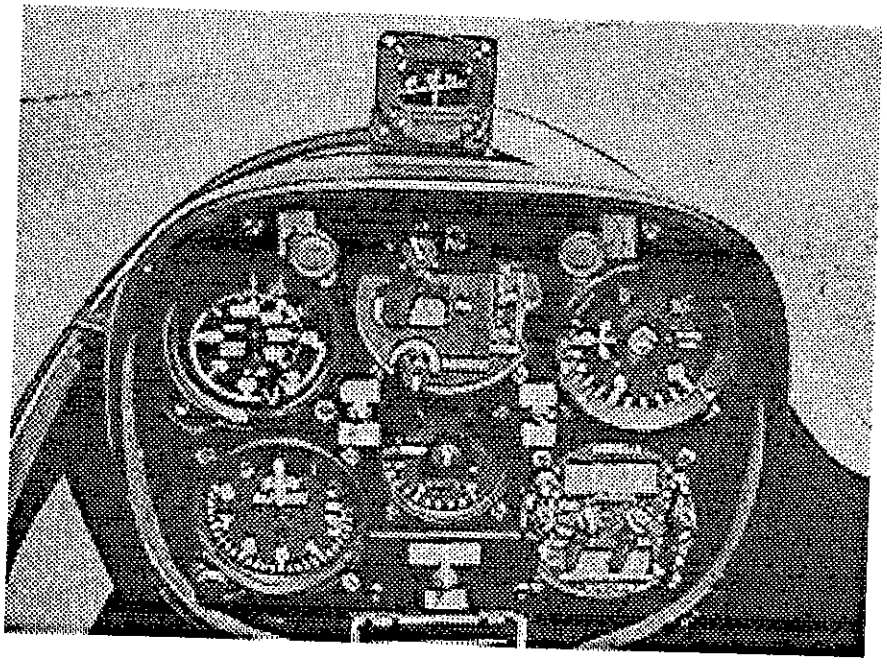
In circling flight it is of no use whatsoever. It is only useable in reasonably steady straight flight. However, if it is wrong, it can lead you astray and turn what may have been a good score into a zero score day or turn a certificate flight into a no achievement one.

Changing instruments around on the panel can change the inbuilt errors. Make sure that you check it after the changes and before the competition begins.

The camera is important. No matter how fast or long a flight may be, if the turn point pictures are not correct it may as well never have been done. The camera mount is also important. To take the picture that you think you are taking it must be firm and correctly aligned. It is worthwhile taking a film of trial pictures on a practice flight.

I am appalled that pilots loose flights that must cost thousands for the sake of a $4 film or another 30 seconds care to load it.

Care with instruments and equipment is well worthwhile. It comes back as good results.



A well equipped panel with a little more than basic instruments.

With an increasing amount of electric and electronic instrumentation, some attention must be paid to their power supply. Batteries have only a moderate reliability, so that having a second battery is highly desirable. It may even be preferable to have separate electrical systems for critical instruments, so that power demands on one cannot possibly affect another. Older radios which have high power demands are very bad at this.

Glider wiring gets rather like the proverbial "mare's nest" as instruments are added and changed even on well looked after gliders.

It is worth while checking out the wiring loom and if necessary, replacing the whole lot with good quality wire, switches, fuses and connectors. As well as making good soldered joints and insulating them properly. Once material and equipment is on hand, this can be done in a few hours.

Instruments are becoming ever more complex. Some have a great deal of information available to the pilot. It is worthwhile putting time into studying the handbooks and spending some time in the cockpit on the ground getting familiar with the switching needed to get the information that you want.

The point of more sophisticated instrumentation in the cockpit is to reduce the pilot's workload and allow concentration on the tactical situation.

Such instruments can be seductive, in that with so much information available the pilot is tempted to play with the instruments and be diverted from the purpose of the flight. Train yourself to use the instruments with the least effort and distraction and the maximum effect.

Using the Gaggles

Gaggle flying is an integral part of competition flying. So, as a competition pilot it is normal to become proficient at using them. All the other pilots will be intent on doing the same thing.

On a cumulus day, once sailplanes have started a race it is unusual for gaggles to develop. Seemingly each pilot has such faith in his ability to read the clouds to find the best lift that gaggles rarely develop. It needs highly disciplined team flying to keep a gaggle together in cumulus conditions.

On blue days it is a different story. Perhaps because gliders are easier to see, perhaps pilots do not have faith in the forest theory. Whatever the reason, gaggles always develop and are usually maintained up to the point where gliders commence their final glide.

Being able to join and keep flying safely in the gaggles is only the basic skill required.

The tactical use of gaggles will depend on a number of factors. To work them to the fullest extent, it is necessary to be flying a glider that is evenly competitive with any other in the class. This must apply to the wing loading capabilities as well as the basic performance.

This also applies to the pilot. You must be able to handle your glider well over the full range of wing loading. This means you must be able to climb with the best pilots at the heaviest wing loading appropriate to the day.

You must learn to match your gliders wing loading to the conditions.

If you cannot match the heavy wing loading then the heavily loaded gliders will leave you behind on the strong days.

When the weather is weak the lightest gliders will climb away, or even leave you to outland while they pussyfoot home.

Most gliders can be flown at 35 to 45 kgs/sqm. and in each class there is only small differences between types. These loadings suit most competition days in Australia.

The World Class PW5 is at 29.5 kgs/sqm at the maximum weight of 300 kgs. Generally it will be flown at this weight for all competitions.

A necessary gaggle skill is to be able to use the feel of the glider to improve your climb rate. Often the first three or four gliders will start the gaggle with 4 or 5 knots climb, but by the time the gaggle has grown to 10 or 15 gliders, the climb rate will reduce to 2 or even less. This is not the weight of the gliders weighing the thermal down, but simply that in order to fit in with each other the gliders are not flying in the core for the full turn.

It needs a high efficient scanning rate and a good feel of the glider to vary the bank angle to work into the best lift. Still, while doing this care is needed not to cut other gliders off and cause them to take avoiding action. This can put them into the path of yet another glider with disastrous results.

The history of glider collisions is that neither pilot sees the other until too late. So top quality lookout and care in manoeuvring is needed to develop and use this skill.

If you are confident that you have everything in your favour, you can plan on leaving last and use the gliders ahead to mark every thermal. That way you will catch them up with minimal time lost searching and centering thermals. If the earliest starters got it right you will catch them as they mark the thermal to climb to final glide height.

Sound a little too magic? It has been done. However, I think that the chances of doing this are getting less each year as there are more and more good pilots.

If you are a little less confident you could leave with a group and hope to stay with them the whole course. If you reach the top of the thermal first, set off slowly, with the McCready set back a little. Soon the others will pass you , but lower. They will reach the next thermal first, but you will reach it higher or at least as they come to your height.

The more adventurous pilots pushing faster and lower will only escape you if they hook into a thermal better than the average by some 3 or 4 knots. Of course, that is what they hope for. Being alone when they hit the thermal reduces the chance of them doing this on the first turn. The time they loose centering is what you pick up by having them mark the thermal core for you.

This is the tactic of the "Leach". Despite some pilots making disparaging remarks about leaches, they themselves will be expert at doing it.

If you keep track of who is doing what, you will find that the lead changes in a rolling over sequence. The best pilots, if they cannot escape the gaggle will be at the top in the last thermal for the final glide. They may slow a little some 20 to 40 kilometres before to achieve this.

Tactically it is better for the adventurous leader to leave just after the front runners and deviate a little to the side so that the gaggle can be joined again if it gets the thermal, and yet a strong core found can be taken advantage of before the gaggle get to it. This is best used nearing the final glide or if there is another gaggle ahead, so that it may be joined and used the same way to leap from gaggle to gaggle.

A frequent competition situation is when the whole class starts too late and the conditions deteriorate as the leading gliders come into the last 100 kilometres. This is where the very late starters sometimes catch up, but more often they find they have driven too low before realising that the situation is changing. They will need to scramble to get home.

If you can discern sufficiently early, that the conditions are changing, the tactic is to slow a little and conserve height more than before. It may be necessary to lighten your glider to remain high. The late thermals are always stronger at height, so that the high pilots are working a stronger order of lift than the lower ones. The high ones will quite rapidly pass the low ones and soon be on a final glide.

This is also the tactic to use if you are coming home late.

If you fall in with a cooperative gaggle, everyone will leave a thermal at the same height and time. Do not cruise directly behind another glider, but 5 or 6 wingspans out to one side. The others should all spread out in a similar fashion.

With several gliders searching in cruise it becomes obvious when the next thermal is encountered. The thermal core is quickly found.

Flying this way in a group, rather than a gaggle, a very fast speed can be maintained. However, any glider which is lighter will soon fall behind.

Competition Tactics

All the tactics that apply to tasks except for starting also apply to competitions. There is no reason to change them. Once a task is commenced there is no more to be done than to fly as well as one possibly can. If that does not win then the whole standard must be improved.

The nature of competitions does allow whole additional sets of tactics to be considered.

In a competition made up of many days we need to consider some overall tactics. Flying the best you can every day is a good tactic, but there is more. In competition there is always the temptation to push that little bit harder, fly a little closer to the risks of landing out than you normally do. This flying on the edge can be very tiring, even if you are in the peak of fitness. This then increases the chance of landing out and blowing the whole competition.

In other sports the top experienced athletes often say, "I have only one or two world standard winning performances a year in me, I must work to bring them out on the right occasions." How many times do we hear of athletes working up to an Olympics, winning everything, only to make a mediocre placing in the one competition that was more important than all the others?

Athletes and pilots are like racehorses, they have "form." What all the preparation is about is to bring that "form" to a peak at the commencement of the major competition of the year.

This is a matter of pacing, and like athletes, glider pilots must pace themselves too.

The time to bring out the top performance is on the first and second day of a competition. Statistically, in 50% of the Australian standard class nationals, the pilot who has won the first day has won the competition even though they may not have held the lead all the way through. This may be a function of the way the scoring system works. The other classes are not so consistent , but follow that general trend.

After that, fly a little more cautiously, and work to score 950 points each day. Do not be concerned if others win a day. If you are in the lead keep to your cautious standard, but be prepared to put out your best efforts on the last two days. Those are the days that everyone who is trying to catch up will be beginning to fly a little more risky. Good quality flying then will either win or bring you up into the top group.

There are some pre flight tactics. If the competition allows the pilots to select their own grid position, then these become a part of tactics. If a wave is likely you may need to get airborne early to give yourself the best chance of working into it. Similarly, you may want to be in a good position to leave early if the task has been overset and it is a certain distance day. If the task is fairly short and it seems that you may be loitering for an hour or more before starting, it will be more useful to be a late take off. Consider all these possibilities, and have your glider prepared adequately early for your crew to put it in position early if that suits your needs for the day.

There are a number of flying tactics as well. These are almost all before the start. In task flying one simply sets off immediately after launch or after the first thermal. Competitions normally hold the opening of a start gate until after everyone has launched and has had a reasonable time to climb to a suitable start height. This is usually 10 to 20 minutes after the last release but may be longer.

The time between launching and the opening of the start gate can be put to good use.

The most important decision to make is when to start. In Australia, tasks are set with the expectation that those who make 80% of the fastest time will get home. So, generally there is time to sample the thermals, and see if they match those forecast in strength, height and quality.

In the speed POST task, which is essentially a race over a set time period, a well set task will insure that all gliders will be forced to start soon after the start gate is opened. If not they will be working weaker conditions at the end of the day resulting in a slower speed.

If the thermals do not match the forecast, consider what your options are.

To make good decisions in this area, a reasonably detailed flight plan is necessary. Even for POST tasks a general plan will be helpful.

The flight plan can then be used to determine start time. This gives the first basic decision. Has the task been overset so that it almost certainly become a distance task? If so, then a start must be made as soon as possible after the gate opens.

Maybe there is a better tactic? See what the others are doing.

On blue days, particularly when associated with poor lift, the way for most pilots to achieve a good result is to leave at the same time and fly the task with a group of good pilots. If you leave on your own you will certainly be caught and then the only option is to fly with the gaggle. It is extremely difficult, and generally risky, to try to get ahead of a gaggle.

Start time tactics vary according to conditions. On days with a high density of cumulus clouds, the starting times of other pilots is not so important as gliders quickly become separated and difficult to see. Gaggles do not develop to any great extent. It is better to start when you see that the cumulus on track are developing nicely. This way you can get in phase with a good "surge" of cumulus and may be able to stay with it for the whole task.

Don't wait indefinitely for the day to improve. If conditions are not good between 1 and 2 pm then they are unlikely to get much better and will probably get even worse towards the end of the day.

As your planned start time approaches work high and upwind of your chosen start point. Try to start on a surge when clouds ahead are developing well. If you miss a surge, then the area around the start point may well take another 20 minutes or more to generate new strong thermals. You will need to asses if it is better to start anyway or to wait and start possibly 30 minutes later than your original planned time. Sometimes this is OK, but it can be a risky tactic.

If it is in the last few days of the competition the top runners may be more concerned with covering each other than completing the task! They may all land out but their scores for the day will be similar. It does not matter that another pilot, who is in any case too far out of the running to overtake the leaders, wins the day. This will maintain the same relative places of the leaders in the competition. This tactic has been used successfully many times in National and World competitions.

This can give an opportunity for pilots just out of the top group to pull up several places. It is worth the risk of leaving early and keeping the chance of task completion high, than going with the top runners gaggle and an almost certain outlanding.

A basic tactic is to let some start and then to follow soon after. It is almost always possible to catch another glider that starts up to three minutes ahead. Allow more time and you probably will not see that glider again until you are home. Of course, it is always possible that the pilot gets stuck somewhere and you catch up. To expect that is to depend on luck rather than skill.

More often than not the task setters get it right and you will have about 20 to 30 minutes wait after the gate opens to get to your optimum start time.

If others start earlier, question why? If it is all the locals it may be a good move to start too. If no one will start question why? What do they know that you do not?

Did the weather forecast indicate an improvement in height after a certain time? Thermal strength is related to height, so any height improvement has a double advantage.

Once you have made the initial climb after launch, search for wave. If you can find one it may give you an initial start, or even winning advantage. Each 1000 feet above the thermal height, will be a free two minutes. If you do get high and are in position to start, then do so, even if it is somewhat earlier than your planned time. Waves are fickle things and may not be there at all at a later time.

Obviously you need to keep track of what the others are doing in this pre start period. Remember that a start time need not be reported until 30 minutes after the start. If the person you want to start near holds that report to the maximum you will not see them that day. Also, crews can report starts, so that the pilot may be long gone before you know about it.

The competition pilot needs to learn to ***recognise every glider type*** from a distance and needs to ***know everyone's markings***. It helps to also recognise pilots voices as they often talk without using a call sign.

Know who everyone is, and what sailplane they are flying. Know who the local pilots are and what their level of experience is. Learn this in the practice period.

If the local pilots start early or hang back, try to find out why. You may even go with them before finding out.

The only positive way to keep track of particular people is to sight them.

At a competition with both 15m and standard class it is easy to mistake one for the other. It can be disconcerting to be hanging about thinking there are plenty of gliders starting as late as you, only to discover they are all the other class!

Do not get into thermal races, or difficult gaggles before the start. This can wear you out so that you are tired before you even start! Concentrate sufficiently to check out all the likely things for the day and no harder until just before you start.

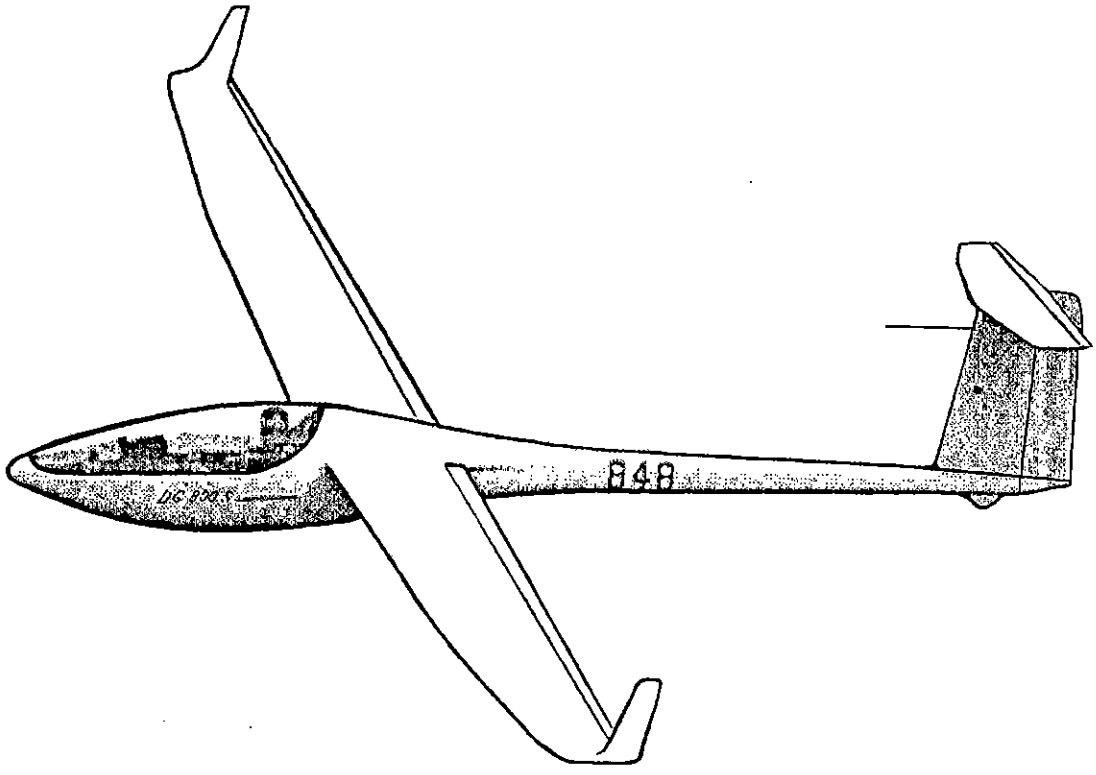
If the weather is as expected there is no reason to alter your planned start time. About 10 minutes before that time look for a good thermal a little upwind from a start point and climb to maximum height.

Try to start a few minutes after some other sailplanes. They will mark the first few thermals for you and you will almost certainly catch them.

You will not catch and probably not even see sailplanes that start more than 5 minutes ahead of you unless they get stuck somewhere.

Other sailplanes will mark thermals so do not be afraid to use them. They will use you.

Be careful not to follow those of another class who may have a different task! If it is a multi class event, know what task the other classes are flying. This may be of some help during the flight. It will certainly avoid being confused as you see sailplanes heading off in a different direction to yourself.



Competition Crewing

The purpose of the crew is to help the pilot fly to the best of his abilities and experience. This can help the pilot win.

This could give the crew a very broad range of activities. Only the practical ones are here.

In a nationals or a smaller competition a pilot may have only one crew. For an internationals three are allowed. One crew member must be nominated as the crew chief. It will be necessary for the pilot or crew chief to divide the duties in the most effective way. This needs to be discussed by the pilot and crew chief and possibly the whole group together.

Each pilot's requirements are different and often change from one competition to the next. Before the first day of crewing it is necessary for the pilot and crew to discuss what the crew will do. As the competition proceeds any changes to be made must be discussed too.

During a competition, the pilot will have varying amounts of stress to handle. While people respond to stress in many different ways, almost certainly the pilot will be highly sensitive to almost anything that is not normal. Noise is a typical one. Crew need to learn their pilots particular stress signs and act so that they can be minimised as far as possible.

Pilots need to remember that while crews are capable of intelligent thought they are not mind readers!

The crew has a full time occupation as there are duties before, during and after each flight.

Here is a checklist of pre-flight items. The crew must be told of any item the pilot wants to do. These items should stay on the checklist and be marked accordingly. They still need to be checked off each day as having been done. Pilots can forget!

Sailplane:

Daily Inspection, clean, with all tapes in 100% condition. Replace any tape that isn't. Stow or replace covers.
Ensure cockpit ballast for pilot weight is correct and secure.
Water Ballast loading; Are there any specific pilot requirements? Wing tanks, tail tank. Always full or different each day. Are there any temporary tapes?
There is a need for the crew to understand completely how the water ballast system operates and how to solve any problems it may cause.
Batteries; Who will arrange charging? Are there spares readily available? Spare fuses?
Radio; Check that it is operational. Make a list of all the frequencies to be used during the competition and what they are for the crew. Does the pilot have a list?
Barograph or Datalogger Does it need sealing, signing or other official checking?
Cameras; Film loaded, official clock or board photos taken, glider registration taken. Who loads films and does these actions?
Camera mounts; Which side? Check each day.
Oxygen system; Operational and sufficient oxygen.
NEVER USE ANY GREASE NEAR OXYGEN SYSTEMS.
Pilot land out bag.

Pilot drinking water fresh water, additives if any and sufficient. Does more need to be purchased?
Pilot in flight food. Lunch and other.
Tie down gear. With position reporting papers.
Parachute.
Cockpit cushions.

Car:

Fuel state sufficient? Who will arrange for filling?
Tow out gear; operational and ready.
Grid comfort gear; chairs, umbrella, water.
Any additional items for the day on board?
Car or Base radio; checked operational?

Trailer:

Parked ready for use? Any keys? Who holds them? Make extra copies if necessary.
Lights checked all serviceable.

Place the sailplane on the grid:

The crew must check the position. Are there any special requirements for the day? When the sailplane is on the grid, the handling gear can be stowed in the car. Does the sailplane need to be parked with the wings level? If so, a wing wheel or other stands must be used. Is there a need to have a tail dolly with the glider for movement up the line?

Tow ropes:

In some competitions each sailplane has its own rope. It is a crew job to retrieve it after the launch.

On the grid:

The pilot should make all the detailed flight preparation of maps, flight plans, start and turn point data, finish lines and any other requirements. However, the crew may assist in putting such data into flight computers or GPS or even discuss these items as a part of the preparation. This can be used as a check. Similarly, the crew may have a pre flight checklist that they go through with the pilot once they are on the grid together. These items need to be discussed and agreed upon pre competition or early in practice.

After takeoff:

Once the sailplane takes off the crew enters a period of full alert and preparedness to go into action quickly.

A listening watch must be kept on the appropriate frequency for pilot messages. This will probably be the airfield control frequency which the pilot will be obliged to stay on while in the vicinity. Other frequencies may be used if the sailplane is out of the area. It is a good idea to team with other crews so that a number of frequencies can be monitored at this critical time.

Once the pilot has contacted a thermal and is climbing to a safe height a brief message **MUST** be sent to the crew. This will move them from full alert to relax but to still be available mode.

The pilot may not contact a thermal and be forced to land back at the airfield. This is likely if the sailplane is one of the first wave to take off. It is also likely on marginal days.

The crew must retrieve the sailplane quickly. Depending on the needs of the sailplane type (and the pilot) water may need to be refilled. Some discussion on how this can be handled is needed in the practice period.

The pilot may discover that some critical item has been forgotten (What went wrong with the checks?) and may want to land to get it.

Some sailplanes are particularly sensitive to loose tapes. Some are almost unflyable due to noise or vibration if critical tapes are loose or come off. This would necessitate landing to be fixed. Spare tapes and glue should be held with the car on the airfield as ready spares for such sailplanes.

Once the pilot is settled at a safe height preparing to start it is likely that information may be requested. It may be useful to devise a simple code or private frequency for items that may help the opposition. The pilot needs to discuss with the crew the likely information wanted. Typical is temperature and its rate of increase.

Once the pilot starts, then the crew need to be on listening watch. How effective the communication can be will depend on the efficiency of the base radio, its antenna, where the radio is positioned, and set adjustments. If communication is required at any range (100 kms+) then the squelch control should be turned off or set so that the radio speaker is making some noise. There is a higher chance of a signal getting through if the squelch is minimised and the volume low rather than the reverse.

In a major competition it is worthwhile putting a base radio in a high location with the best antenna that can be obtained. In mountainous areas it may be necessary to set up a remote radio site.

It is problematical just how useful information can be to the pilot. Some like it. Some think it is a distraction. Sometimes it can be critical to a flight or even safety. Another area to discuss.

Approaching the likely finish time the pilot will want the local wind and any significant weather information. The crew should be updating this frequently and on standby to reply on request. Alternatively it could be broadcast from time to time in the expectation that the pilot will receive it. Possibly pilots nearer to home will receive it and be able to relay.

As a general principle, crews should not call pilots.

Once a finishing message is heard the crew needs to be ready at the most convenient place to retrieve the glider as soon as it has stopped rolling, maintaining a good lookout for other landing gliders. On most airfields this needs to be done as quickly as possible to keep the landing area open for further arrivals.

After landing:

After sailplane retrieval is in hand the pilot usually has to hand films or data loggers in as soon as possible. The pilot may have personal needs to attend to. Also there may be some recovery exercises that need to be done in this early post flight period.

The crew can then secure the sailplane and clean off the days collection of bugs. This is always best done as soon as possible as they tend to harden and stain the finish if left on for any length of time.

Batteries may need removing for charging and other equipment, such as oxygen, may need attention. Tapes need checking.

The night weather needs considering too. If thunderstorms are forecast it may be better to derig into the trailer or get hangarage. Even a rain forecast should provoke this consideration. Some extra simple work is better than making a rush effort to repair damage.

After securing the sailplane the pilot and crew need to go over any additional tasks that are needed before the next day's flying.

While the flight was being made the crew may have more duties than maintaining a radio watch. These can be diverse and numerous depending in the accommodation and living situation of the team. This is another area that the pilot and crew need to arrange early in the competition period. ***Pilots, remember that crews are not mind readers.***

In foreign countries, especially if English is not the first language, even the simplest item (such as two sticks to hold the wings level) that needs to be obtained can take an inordinate amount of time. If there is more than one crew it is better to delegate this so that there is still one person readily available on the radio or at the airfield at all times.

The crew should be organised to do a retrieve without any delay. Once the sailplane has landed the race is over for the day. However, this is not a reason to take any longer than necessary. Retrieves have a history of taking far longer than is ever thought possible. The sooner the crew can get to the pilot the better. ***Retrieves are another story, or volume of stories.***

What the pilot can do for the crew:

Here are some things that the pilot can do for the crew.

Where the crew is most needed is when the pilot is unfortunate enough to outland. This is where the pilot needs to cooperate with the crew and help a retrieve to be carried out with a minimum of delay and fuss.

Your crew is ready to go as soon as the message is received They will usually have an indication that you are going to outland from radio reports and will have the trailer ready to leave as soon as the position is confirmed.

Some retrieves require hours of driving and the sooner the crew can leave the better. A GPS coordinate is a great help but full property details are required whenever possible. ***Always give a contact phone number.*** Either your mobile or that of the farmer, the name of the property and any features that may make it easy to find from the road.
If directions are given by the farmer please ask him for the most direct well signposted route. Short cuts can sometimes be more confusing than helpful. If at all possible, divert when an outlanding seems inevitable and land near a major road.

While waiting for your crew to arrive remove all tapes etc from the glider and have it ready for derigging. If you are close to the road, estimate the time it will take your crew to arrive and ***wait at the entrance gate.*** If the homestead is some distance-from the road, wait at the house or just outside the house gate. We have all heard stories of pilots enjoying a dinner or drinking a few ales while their hapless crew is driving up and down remote country roads in the dark looking for them. You should have already ascertained the easiest way to get into the paddock. There are only a few things worse than trying to find a farm gate in the dark!

Your crew is probably tired after a long drive and more than a little annoyed at having to do it. Don't give them a hard time. They have found you, show some gratitude. They are there to help you, and you may need them again next year!

We all know how draining competition flying can be. Your crew is most likely a pilot who ***does*** understand. Any friendship under competition conditions can be strained at times. Consideration shown by both pilots and crews make for a more harmonious and successful competition.

Pilots in competitions without crews:

Fairly often in smaller competitions pilots find that there is just no crew available to go with them. The only option is to give the competition a miss or go crewless in the hope that if they do land out someone will help.

It is not too difficult with good single person moving gear, for the pilot to do all tasks without needing any help at all. The pilot will, however, need help during rigging, de-rigging and in the case of an outlanding.

Help during rigging and derigging is not usually a problem. The major problem is when the crewless pilot outlands.

Here are some points that could help this pilot have a hassle free retrieve.

Your car and trailer must ***both*** have the registration of the glider prominently displayed.

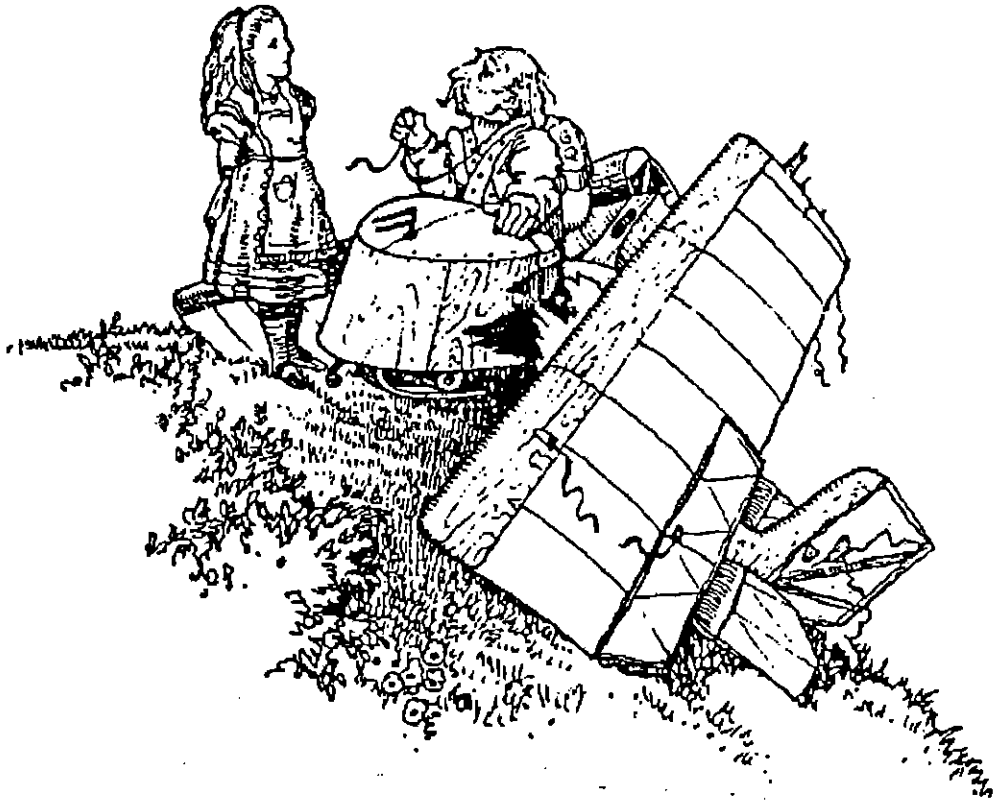
Before you take off make sure that all dollies and associated gear that may be needed on a retrieve have been placed in the trailer or car. Make sure it is the trailer if the car is small or has lots of other gear. You must have room for two people without any repacking.

The car should be kept full of fuel and sufficient cash left somewhere in the car for fuel to be purchased on route. As it is sometimes very difficult to purchase fuel in remote areas it will be useful to have at least one jerrycan of fuel in the car or trailer.

A full check list, left in a prominent position in the car, should be provided. The check list should cover any peculiarities your car and trailer may have. What is the safe towing speed for the combination? Some cars run on LPG. How does it change from gas to petrol? Does it have a starting problem and so on.
Your check list should also include any equipment needed to be placed in the trailer from the tie down area. A full set of road maps for the task area should also be available in the car together with your mobile number if you have one.

The people who spend some considerable time coming to retrieve you don't have to do it. Please treat them well when they find you.

There is one recurring theme throughout this section. Communicate, Communicate, Communicate! Make sure everybody does it.



Competing at the Top

Team work in individual performance sports

Individual performance sports like gliding usually attract self-reliant, self-motivated and self-disciplined people who are used to making their own decisions and accepting responsibility for their subsequent performance.

These are all very desirable characteristics but may present a challenge in a team situation, particularly in those sports where few participants have learned to accept outside help.

For a team to function effectively, individual members may have to change their approach somewhat (and perhaps relinquish a certain degree of personal control), to maximise the opportunities available to the team as a whole.

For this to happen, team members must be convinced that their own performance will benefit from such a change. Accordingly, coaching and team management in the individual performance sports should be generally supportive (rather than directive) in nature and must provide all members with an opportunity to enhance their own performance.

Working in an international team

Once you are selected in an international team the game has just changed. Your team mates are the very same pilots that you competed hard against to get selected! Now you will be asked for a high degree of cooperation with them. This may require considerable effort. However if you are going to present your best effort you must be totally unstinted with your cooperation. And, of course so must all the other pilots.

If this does not happen there will be some discord, and one or more pilots will not be able to give their best performance. It is worth the effort, and win or lose, all will be better for the experience.

This does not require team flying. That is a separate skill again. What is possible in that regard will depend on the background of the particular pilots.

What is needed is information sharing. If team flying is a possibility then it will be a bonus.

There are a number of prerequisites for this to be successful. These are:

⇒ Team cohesion depends on every aspect of living together. This needs some give and take.

⇒ A team only works if there is something in it for everyone. Work to make it that way.

⇒ If contact (between team members) is not normal or habitual, then the Captain ***must*** initiate it and continue to facilitate it.

⇒ Remember, for those who have worked on their own, accepting help (let alone advice!) from someone else is not easy.

⇒ ***Everybody must know everyone else's game plan. No one can have a hidden agenda!!***

Once team members are clear in themselves on these points and are prepared to apply the necessary effort, then the cooperative system can be worked out to suit the particular group and competition.

Additional team members

A national team will have a Team Manager, whose duty it is to ensure that all the background needs of pilots and crews are met. Also there may be a Team Captain. The Team Captain will preferably be a non competing pilot, but may be competing in a small team. The Team Captain's role is to ensure that each pilot is flying to the top of their abilities. Both of these people need to commence their duties as soon as a team is announced. Pilots will need to get used to working with these two. The responsibilities for the various duties need to be established so there is no duplication or working to cross purposes.

Pre competition

At an early time in the competition preparation period there is need of a pilot's meeting to go over all concerns. If this cannot happen prior to arrival at the competition site, then it must be as early as possible after arrival. There may need to be a number of such meetings to get all aspects of cooperation clear before the competition, and preferably as early as possible in the practice period.

Pre flight

Most teams have found that it is useful to have a group discussion immediately after briefing. This on some occasions may mean that crews miss it due to the needs of putting gliders on line and other preparation. This needs to be confined to the days task. Any pilots or team members (we generally can recruit one or more local pilots who can advise on conditions) who can add to the knowledge pool should table any information they think may, however remotely, assist in the task.

The topics are: weather, task geography and tactical options for the day.

Post flight

This is often a difficult meeting to have as outlandings and domestic items often mean that all pilots cannot attend reasonably soon after the flight. The pilots should discuss the flight as soon as they reasonably can get together. Over dinner, or immediately after, should be the latest time for this meeting. As a fall back, if a meeting is not possible on the day of the flight, then before briefing the next day is a suitable time.

Topics should be: weather - was it as expected? navigational problems, pilot performance, any unusual or strange factors encountered.

In flight

Communication in flight may vary considerably with the particular pilots and situation. There may be little or lots of it. Crews need to be prepared for lots and not be too disappointed if there is little. Little communication generally means that the pilots are working hard and do not want interruptions.

For cooperation there is a need for a number of protocols to be established and it is done that way exclusively. Consistency will help lead to trust in the information given.

Position reports: Distance and bearing from an easily visible and identifiable feature. Add height and if relevant climb rate in average showing at the time. If other teams are a problem the control features can be coded. If GPS locations are suitable to use these should be named, numbered or coded as well. Agreement must be reached on this in the practice period.

Messages: Always give the message whether communication is established or not. Glider to ground communication is frequently better than the reverse.

Requests: These should be limited and brief. Pilots need to establish the best form for this exchange. If a request for information has information itself it is more useful than a bald request and has more chance of being answered.

What the pilot needs to prepare

Know the rules. These must be studied so that the pilot has a clear understanding of them. If there is a problem of interpretation, bring it up at the first available occasion. Try to resolve all doubts about meaning before the competition starts.

Remember, if there is some aspect of the rules that you do not like or strongly disagree with, there is nothing you can do about that for this competition. If you want change you can campaign on that for some future competition. Do not let that distract you from the current competition.

Be as prepared as possible. The point of overload is determined by preparation and training. Adequate preparation and training will ensure that you do not reach that point.

Team Flying

With more than one pilot in a class there is the possibility of team flying. We have seen that the French and Poles have used this to good effect in recent years. Even if it does not produce a winner, it puts those pilots who are doing it in the top group.

Obviously it requires practice, but it also requires that the participants are all of a suitable nature and temperament to be an effective team. If this is not so, the results are more likely to be disadvantageous to one or all.

The good team member must be able to:

- ◊ **Accept with equanimity that one of the other team members may win.**
- ◊ **Accept the wishes of the other team members.**
- ◊ **To be firm about one's own wishes.**
- ◊ **Be compatible in flying style.**
- ◊ **Be willing to share.**

Communication is the key feature of team flying. This needs good quality reliable radios and practice.

It must start on the ground well before the competition.

In order to keep the air radio talk within reasonable bounds and also to avoid impinging on the concentration of team members, it must be clear between the team;

> ***What information they want.***
> ***What information they don't want. This may take some practice to discover.***

In general, radio talk should be giving information, not asking questions. If there is any concern that this information could be useful to other competitors, then a code can be devised for that type of information.

If thermal strength information is included then the varios of the different sailplanes must be checked against each other.

If team flying is to be a serious option it really must come from the pilots concerned. If it is to be imposed by team organisers or managers, then it should be done at the selection time, so that compatible pilots will be in the team. This is not the case with our current methods of team selection and as a consequence we cannot expect to impose it.

Remember that the Poles and French have been doing this for years. It would be totally unreasonable to expect our pilots to match their standard by starting in the practice week of a future world comps.

Competition Routine

Once you get to the competition site, as early as possible in the practice period, it is most useful to establish a routine. This will to some extent make up for the change from your normal life and can provide a strong settling factor.

A key factor of this is that the routine covers all your necessary activities with adequate time. Make all the time allocations generous. It is important not to be hurrying anywhere and also have sufficient time to spare to cope with minor contingencies which are inevitable in such a situation. The program can be tightened up once you are settled, if that is necessary.

If this is established early, then your time at the competition can be relaxed so that you can devote your entire energy to the competition itself. After all that has almost certainly been the focus of your endeavours for the past two years or more.

Accommodation is important. If what you have started with is not satisfactory, then it has to be changed or enough changes made so that it is not an irritation.

Satisfactory meal arrangements must be made. While it may not be possible to exactly repeat what you have at home, you should be able to keep it sufficiently similar so as not to cause any bodily upset. If your physical and mental preparation has been good, a not so perfect diet will not cause any significant deterioration in the two or three weeks of a competition.

I find that it is almost impossible to keep a physical exercise program going during a competition. Perhaps others have more success with this? If there is a rest day and there are no urgent jobs needed, a light amount of exercise can be very beneficial.

The need for some mental relaxation will certainly be very individual. If you do relaxation exercises or meditation regularly, then it will be important to make an allocation of time and place to continue this.

Sites with Ridge, Wave and Thermal Conditions

These are the sites that are the most difficult for Australian pilots, simply because we have no such sites to practice on in Australia. Our mountain areas do not have ridges organised into lines suitable to the prevailing winds. Mostly we explore them using thermals with the occasional working ridge. We have few ridges that are reliably soarable for more than 20 kms and our wave sites are not reliable either. Possibly the frequent occurrence of thermal wave may give us sufficient training in that mode.

World competitions in recent years in Italy, Austria, New Zealand and France all use such sites. This practice is likely to continue as, not only is the scenery the best there is in the world, but the demands on the glider pilot fit the European concept that a world champion must be a versatile pilot. Not one who has limited skills only.

This becomes even more difficult as each one is very site specific. Being skilled in these forms of soaring from one site merely makes a better starting point for learning about another than flatland soaring experience only. Flying from a mountain site can be exhilarating and relatively safe soaring. Racing from them becomes another matter.

For the Reiti, Italy competition, the New Zealand pilots put in three months of practice in addition to the pre worlds and still did not win! Of the non locals they would have had the best background experience. Here are some comments about each site from various pilots who have flown there. Some of these may be able to be transferred.

Things to remember for ridge and wave flying

In an extensive mountain and valley area it soon occurs that you have only slopes available as a visual reference. The horizon is never horizontal! Initially this is quite difficult to cope with. There is a need to use the ASI more and it takes many days of flying to get used to and overcome.

Remember that when flying in wave or along ridges, gliders will be travelling quite fast in both directions along it!! Keep a good lookout and remember the rules of passing and meeting.

Water ballast does not usually freeze. There is too much mass too well insulated, unless you are up there all day. Fill the main tanks to three quarters only and do not attempt to drop at heights above freezing level. The water will freeze in the outlet and block it up. However, the water in the tail tank, being a much smaller mass, will freeze. Put anti freeze into the tail tank to prevent this and the consequent problem that it can cause. Alternatively leave it empty.

There is already a large collection of knowledge of most mountain areas. As it is essential to tap this knowledge when starting in a new area, find people who know the area and become their student until you have sufficient grasp of it to venture alone.

Some notes from Reiti, Italy. (World comps 1985)

At Reiti, almost all the ridge lift was actually anabatic. This is caused by the effect of sun heating on the higher slopes. This is sometimes confusing as if the winds are weak, the side opposite to the prevailing wind will be working strongest and often both sides will work to some extent! In the afternoon it is always the western side that works best.

When anabatic lift is the main sustaining lift, quite often thermals will be found on corners, or in convergence areas in a similar fashion to the way wave is formed. It needs good visualisation of flows to work out how such systems may work.

Unlike ridge lift, anabatic lift is usually too weak by one quarter of the way down from the top. It is always best to try to work right on top or only a little down from it. Much lower and you will need to go out into the valley and try to find some thermal or find a lower ridge where anabatic or ridge lift is working.

Notes from discussions at Omarama, New Zealand. (World comps 1995)

The Australian team with Billy Walker, Justin Wills, Richard Halstead and others.

For New Zealand, predominantly the winds are westerly with variations north and south of west.

With the mountains mostly in north-south ridges, this gives both ridge and wave at the same time. Numerous factors, some very obscure, influence this. Sometimes the wave effect from one ridge cancels out the lift normally expected on another ridge. Sometimes it may enhance it. However, there is sufficient consistency so that the usual patterns may be learnt.

To get into the wave, first you must work as high as possible on a ridge.

This may not be to level with the top of the ridge if the ridge has a very shallow slope near the top and it is fairly flat on top. If it has a sharp top then it may be possible to get higher than the top.

Once you are as high as possible, then push out from the ridge into wind.

Fly fast enough to move against the wind But not so fast that you lose lots of height. Only experience will be the guide to this. At some distance out you should find a rotor. This will be quite rough and you may have to work it like a thermal for a thousand feet or more. Then you should find the wave. This will be immediately obvious as the lift will become quite smooth.

Sometimes you will find a wave without having to use a rotor.

When working the rotor you will have to work forward (into the wind) with every turn. When you decide to turn from the position of flying into the wind, make it very steep and then straighten up to fly forward each time you are into wind. This will make your turns like a letter "D".

If you do not find the rotor or wave return to the ridge and start again. Try a different part of the ridge that may give more height, try a slightly different line when moving out from the ridge, or try both.

From some ridges there are specific locations that will always have a good lift if the wave is working. "Hugo's Elevator" is one adjacent to the Ewe Range. This range is also known as Aubrey's Range. Hugo's Elevator is a bowl in the hill that must be in the same alignment to the wind that creates a wave. This wave needs a North West wind.

To be able to contact these rotors and waves with the maximum of certainty it is necessary to be good at understanding which ridges are working and being able to work them up.

In an area of mountains and valleys such as around Omarama, it is necessary to think of airflows

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This applies universally for any mountainous area that produces ridge and wave lift together.

It is not enough to have a ridge and a wind blowing against it. ***If it can, the wind will blow around the ridge rather than over it.*** This is particularly so if the wind is cold. Then there will be no lift. This canalisation can occur well above ridge height. If a valley is near the wind line then the wind will channel through the valley. This canalisation may cause very strong winds in the valleys and very little on the ridges.

If there is thermal activity, it will assist the ridge lift.

We also need to think of the mountains upwind of the place we are at. A wave produced by them may place a down flow on the ridge here. This will normally be very close to the ridge. Even if this is the case there still may be some ridge lift further out from the ridge.

This down flow will then channel along a valley, usually the nearest and out to the east. All the river valleys that exit the ranges to the east have very strong winds along them. Great care is needed if you are landing at one of the airfields in their vicinity.

When a number of valleys flow into a larger one there will be a spreading of the air which will reduce the wind speed.

It may give a convergence. This will be the source of a thermal or rotor. There are a number of areas that are very consistent in producing lift through convergence.

The most notable convergence is the Tyree Pet. This is an isolated wave that can go to great (as yet unused) heights. It is at the convergence of two wave systems from the Pisa, Ruggedies, McClays and Tyree Ranges.

A convergence may also enhance ridge lift and give rise to a wave by striking a corner of a ridge.

Where the valleys are wider the slowing of the winds will also allow the ridges to work better than where they are narrow with strong winds and strong canal effects.

While the airflows are very complex, there is sufficient consistency and pattern that it can be learnt. This pattern will be different for different wind directions so that there are a number of different patterns for any one location.

Easterly airflows that come up valleys are usually very shallow. Rarely more than 2000 feet deep and often as little as 300 feet. If the upper wind has a westerly component the tops of the ridges will still be working on the west side.

Think of wind and gather every piece of information about it as you fly.

Notes from France from, Bruce Taylor, Paul Mander and David Jansen.

(Lavender glide, Pre World comps 1996)

The wave systems were weaker and not as well organised as they were in New Zealand. There was a need to learn when to leave the wave or cumulus and go down onto the ridges. Also the reverse.

The passes were very significant. It was vital to know each and the lift patterns around them. It was often necessary to work weak lift (1 to 2 kts) nearby to get high enough to go through a pass.