Training for cross-country

This article is a transcription of a recording unearthed from a series of lectures Dr Reichmann presented at an international soaring symposium given in Australia in 1988. The content is timeless.

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from *New Zealand Gliding Kiwi*

The modern Olympic sports have developed to be competitions in physical skills. The psychological state of the athlete plays an additional role, while the intellect has a minor influence on the question of winning or losing.

Gliding seems to be different. The main emphasis is given by the intellect, physical condition is a prerequisite and the psyche plays an additional, important role. Considering these facts, gliding training is different from the common interpretation of training in physical sports. To achieve the aim of the individual or even the absolute maximum in performance (the aim of any training according to the definition in *Mayers Encyclopædia*) in the sport of gliding, training has to develop the physical, the psychological and, in addition, the intellectual.

As far as physical skills are concerned in gliding, we may understand this as not only the physical condition of the pilot but also the ability to control and to steer a glider perfectly. That means in any maneuver the yaw string should stay in the middle, thermals should be centred quickly, the pilot should be aware of stall situations early enough to prevent any danger, and spin recovery whenever needed should be a routine as well as outlanding procedures.

By psychological skills we may understand this as good motivation and positive thinking. Generally the stress should be limited to just an amount which allows the pilot to reach the maximum performance. Even in extraordinary situations when conditions may be very stressful, the pilot should still be able to control his mind and his reactions.

By intellectual skills we may understand this as a background of knowledge in gliding theory as well as the experience we have gained from other people or by our own flights. In addition, what I personally think is very important, the pilot should know about the importance of facts influencing flight decisions. He should be able to set the right priorities even if he has to handle a lot of contradictory inputs!

Quite often, maybe every minute, many alternatives like "should I fly more right or left? ... faster or slower? ... should I circle or not? ..." and so on, have to be recognized, weighed, and should lead to a definite decision. It may surprise you, but the combination of state of mind and physical condition in gliding seems to meet the Olympic ideals better than some well-established Olympic sports just performed at Seoul. Maybe some Greek athlete of the past who raced in a cart towed by a lot of horses would prefer today to fly a gliding competition trying to win nothing but honour instead of joining the Olympic games which suffer from omnipresent public relations people, from politics, and from lots of money.

You may wish to hear a lecture which comes from practice, deals with practice, and leads to practice. So I will try to meet this interest and perhaps get you to continue to think about training a little more, do something more, maybe fly a little better, or help others to improve.

Questions concerning training are seldom like mathematics: beside a clear right or wrong there is a maybe, a let's try, and a very individual influence of the person who deals with training. I cannot do otherwise than give you my opinions. They may not always be the same as yours. Nevertheless I will do it frankly and sharply enough, and so try to encourage you to question me when you think it's worthwhile or necessary.

The Glider Here are some ideas on which glider could do which job in training:

- Any glider whose penetration performance is somewhat around or better than, let's say 28, should be well for training purposes.
- Good pilots fly well in any glider. Bad pilots fly badly in every glider.
- The development of a pilot's skill should be very independent from the performance of the glider.
- Money can buy a good sailplane. Money cannot buy a pilot skill — sometimes it's the contrary!
- Easy-to-handle and easy-to-read instruments make it easier to fly.
- High-tech computerized instrumentation needs the attention of the pilot. Only very few pilots know not only how to handle all functions of their computers but also know the more or less inevitable faults of the complicated pressure measuring and calculating systems which characterize instruments.

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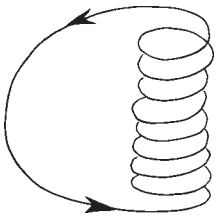

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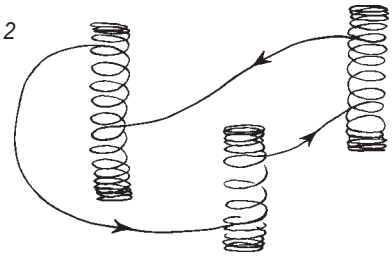

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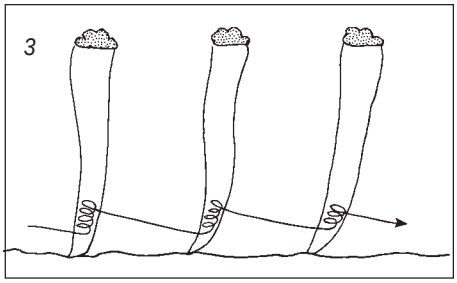

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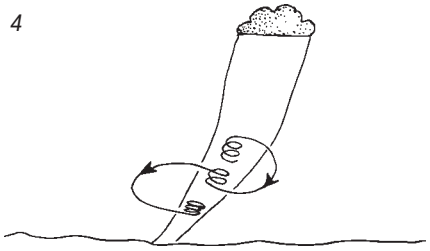

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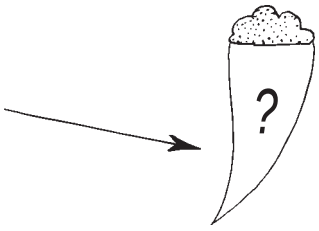

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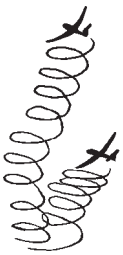

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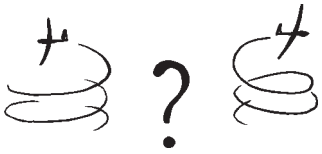

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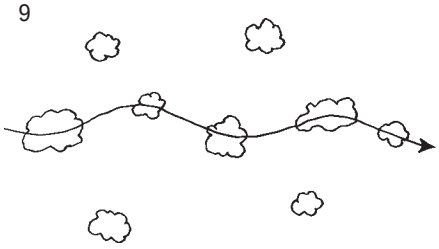

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Final climb
= speed setting
= initial climb

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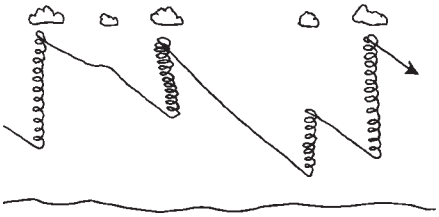

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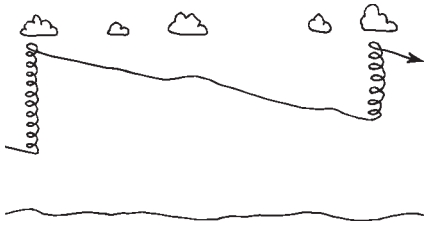

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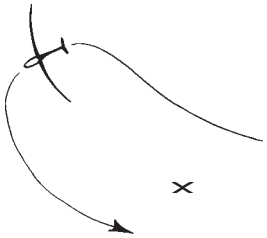

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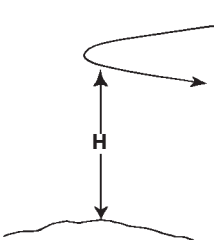

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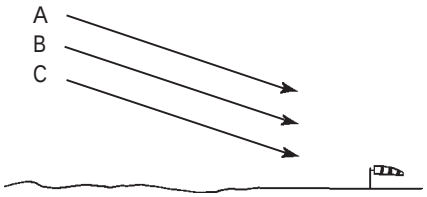

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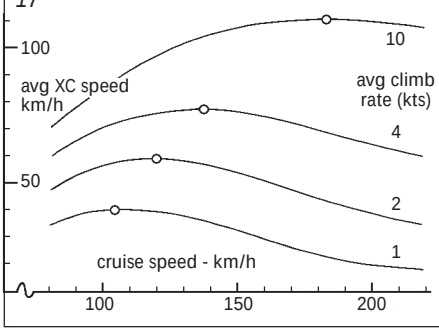

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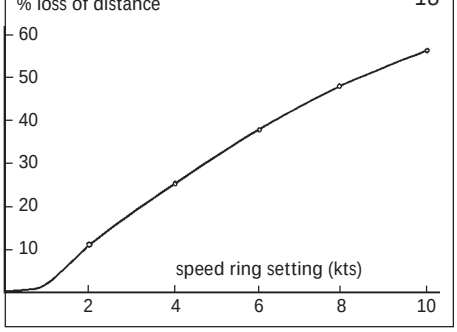

I know these sentences sound a bit extreme. Sure, a pilot needs some 20 hours to get accustomed to fibreglass when he only flew old gliders before. After another 20 to 30 hours in large Open class gliders the pilot should also be able to fly these gliders well enough for a competition entry. The result in speed and distance is always produced by the combination of glider performance and pilot skill.

But, the pilot's skills themselves may not be developed more successfully by using sophisticated gliders at a rather low level of pilot skill. Do you know the proud and at the same time anxious faces of some well-situated private owners who have little experience but have just bought the very best glider? There is no way to perform better without the uncomfortable and time-consuming way of learning and training. Good, if they bought two-seaters which they share with experienced pilots. Wonderful, if there is sponsorship, but dangerous if there is neither of these but only the strong ambition which comes almost automatically when they own a supership. Compared with single-seater sailplanes, two-seaters have a lot of advantages and very few disadvantages concerning cross-country training. Motorgliders offer special possibilities and advantages too but they may leave the pilot with a false feeling of safety as no outlanding (which has risks) may be necessary, and he may lose low altitude and outlanding experience.

Flying tasks for training As a lot has been published on this item it might be sufficient to give a survey and to add some proposals, some of which have been practised in training camps. Others are just ideas.

Training in thermal skills

- Leave the lift and use airbrakes to lose 1500 feet of altitude, then try to find and centre the same lift again (figure 1).
- Change thermals as soon as the climb rate drops below a fixed value. In case you drop lower than a fixed altitude use weaker lift also (figure 2).
- While always in reach of a safe airport landing, try to use thermals at low altitude. Fix a minimum flight altitude (figure 3).
- While always in reach of a safe airport landing, explore the trigger point and the very low part of a thermal. Circle lower, step by step by leaving and entering the thermal again or just by using the airbrakes (figure 4).
- Predict the strength of the next thermal in out loud before you fly to it. You will be astonished how often you are wrong (figure 5).
- Try to outclimb everybody but always without disturbing their flight (figure 6).
- Circle during a whole day only in the direction you don't like (figure 7).
- Fly with a maximum allowed wing loading in weak conditions.
- Centre thermals differently from what you are used to doing (figure 8).
- Climb like the birds. Centre thermals according to your feelings; no visual or acoustic vario reading.

Training in straight flight

- Low altitude loss. Minimize circling time (stop watch or computer control) by deviations (figure 9).
- Minimize in-flight navigation by improving flight preparation. Try to do it so well that you almost don't need to use the map when flying.
- Experience different alternatives when you fly together with your friends (figure 10).
- Try to fly according to the speed-to-fly rule (figure 11).
- Fly with a too high speed setting — but stop this game before you have to land out (figure 12).
- Fly with setting 1-2 knots in strong conditions but circle only in the very best of thermals (figure 13).
- Avoid load factors less than 0.5g to avoid loss by excessive drag.

Turnpoint training Fifty percent of pilots who have documented at least ten flights never have a problem with the turnpoint photosector. We should always teach our student pilots how to fly and to photograph a turnpoint long before the disappointment of a negative flight document occurs.

The fixed camera mount is a must, especially for newcomers. There is a very simple method using suction cups to attach the camera to the plexiglass of the canopy.

Fly a turnpoint photo-safari. Take one photo per turnpoint only. Check photos and sector after the film has been developed (figure 14).

Final glide Fly a calculated final glide to every turnpoint. Arrive at the turnpoint at an altitude you choose before the flight (figure 15). Fly calculated final glides to your airport. Diminish the calculated arrival height as you get more experience and when conditions are strong (figure 16).

Landing

- Every landing has to be a spot landing after a standard approach pattern. Try to touch down and stop within 300 feet.
- Become a frequent outlander by choosing and flying tasks to the maximum of the daytime. You will soon consider outlandings to be a normal standard procedure and you will stay in practical experience.

Organized training in clubs and camps For successful training in groups, the absence of any envy is a must. This is easy to say but rare to find! We should see our aim in making talented pilots much better than ourselves. The club should provide material and financial help for talented pilots whose talent to make money is underdeveloped.

- Fly the same or a similar task together.
- A pilots' meeting before and after the flight will provide fun, provide motivation, and be good for thirst and for camaraderie.
- Start your race at the same altitude and time. For better comparison meet again after a while at the altitude of the lowest participant for a new racehorse start.
- Groups may team fly against other groups or against individuals.
- Fly according to the competition rules of the competition you prepare for.
- The best pilot should tend to fly a slower glider instead of the best when racing against each other.

- Fly Pilot Selected Tasks (PST). They are fun and you will learn a lot.
- Try different possibilities of team flying ranging from close pair flying to loose information teams.

Two-seater training

- Learn from observing and asking a good pilot during his flight by being a passenger.
- Change control between pilots after approximately every hour.
- Explain what course you steer and why. Say what you expect the conditions to be next.
- Accept corrections to your flying style.
- If you are interested in optimizing a two-seater flight, have a definite splitting of tasks. One of you should be the responsible pilot. The other would advise but never complain! Navigation, radio, calculations etc. could be the task of the second pilot. If you like, you could add very important arrangements on who will prepare meals and drinks. In fact, flying two-seaters cross-country is great fun!
- For training purposes the task could be that each pilot does exactly what he needs to train instead of doing what he knows he can already do best. Disadvantages in two-seater training occur when the pilots don't fit together and when it's not clear who is responsible and for what task. I know of a crash at the home airfield of two instructors flying together in a K13. When their club friends came, they were still arguing who was responsible. Each of them thought the other had control, but apparently nobody did!

The psychological situation of two-seater pilots is different from that of the single-seater pilots. Being accompanied by a good pilot may lead to a wrong feeling of safety. In any case, he may hesitate to correct you even in a dangerous situation. Long time training for long distance flights should preferably take place in a single-seater.

Motorglider training A motorglider is ideal to discover what is possible and ideal to see how far you can go. In addition, a self-launching motorglider makes flying a lot easier and almost independent of help.

In our national training camps in the French Alps, the motorgliders fly much further than the gliders because the pilots do not fear the very uncomfortable retrieve through the mountains.

It is interesting that motors are not used during almost all flights! In soaring, an outlanding is a long procedure which starts when or even before getting low. Motorglider pilots should not forget how to do all this. Sometimes it may happen that the engine will not start when needed. Considering this, the pilot will decide to start the engine well in advance of a possible outlanding. So he might miss a chance to recover by soaring methods. In competitions those difficult situations usually determine the final results. Flying a motorglider with the possibility to start the engine when conditions get difficult leads to a different psychic situation of the pilot as compared to pure sailplane soaring. This happens automatically and maybe necessarily.

Physical fitness Physical fitness is important for cross-country training but will not be a subject here as there already exists a lot of literature. Just do something regularly. Don't do it excessively and have fun with it. To learn more about it read a specialized book or ask your doctor.

Training the intellect As mentioned above we should try to get enough knowledge and especially try to get an overview of the factors which influence the flight result. We should be able to judge their importance. Some examples:

- A whole generation of glider pilots suffered from the imaginary need to fly exactly according to the speed ring although already in 1938 Polish publications showed that there is very little influence of the speed-to-fly on the average speed (figure 17).

- A lot of pilots flew and fly unnecessarily low average speeds when they get low, because they are anxious and fly with a zero setting. They don't know that with a setting at 1 knot they have almost the same glide angle and lose much less average speed in case they recover and complete the task (figure 18).

- The speed-to-fly rule: *final climb = speed setting = initial climb* can be converted into *final climb = initial climb* which is very important, while "speed setting according to climb rates" is of more minor importance.

As a result, the speed setting may be open to competition tactics. We may fly faster when we want to catch a gaggle in front and we may fly slower when we are uncertain in estimating the conditions. Both 'faults' lead to very little loss in average speed.

Motivation and stress Stress by itself is not at all something negative. The right amount is just good for maximum performance. Motivation on the other hand must not necessarily always be something good. Too much motivation limits the ability of information uptake and you may fall back into decision tactics which you overcame a long time ago.

Maybe it's helpful to try to have fun in flying. This should lead to enough motivation and avoid excessive stress. In any case, fun is the best value by itself, or isn't fun the reason why you fly?

If this is not sufficient as advice, try to find a reasonable book out of a wide variety of publications on motivation and stress problems and hope to find a way to solve such problems. The secret of quite a lot of very successful pilots sounds more or less simple, like

HAVE FUN, TRY YOUR BEST, TAKE IT EASY

I think the fact that fun seems to be important for gliding success is wonderful. We don't have to struggle one against the other. We try to use a very little bit of the immense power which Nature wastes in the air each day. We get information from Nature herself, from clouds and birds, maybe from other competitors also. We may see them as companions rather than as opponents.

Maybe it's just this which leads to an international friendship among pilots from all over the world, no matter which nation or political system they come from. ❖