

Finding Lift

Some advice is timeless and universal.

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Outside my kitting shop on Camano Island, Washington in the early 1980s. (image: Bob Dodgson).

How many times have you heard someone at a thermal contest say, "I always get all the sink. Every time it's my turn to fly, there is no lift." Then, there are other people who seem to get their air times most of the time. What are the secrets that enable some flyers to find 'lift' nearly every time they fly? This article assumes that the contest is properly run so that sandbagging, the deplorable crutch of the small-minded and unsportsmanlike competitor, is not allowed. After all, anyone can max every flight if he only goes up on tow after seeing someone else spot the lift.

Without a doubt, great thermal flyers have a gift. Most of the skills involved,

however, can be learned. The four basic ingredients in thermal flying are:

1. Being decisive and knowing the most probable areas to look for lift at any given time and having the guts to go for it.
2. Being able to recognize workable lift, no matter how weak, when your plane passes through it, while not being seduced by turbulent air that is not workable.
3. Having a plane and the flying skills necessary to work the lift as efficiently as possible.
4. Knowing when to leave a dying thermal and when to push the stick forward and reflex the flaps to force the plane to quickly fly out of a bad area rather than to aimlessly flounder around in down air as the less decisive flyers are often seen doing.

Knowing where to look for lift is a lot like playing cards. The best players are the ones who keep track of what cards have been dealt so they can know what the odds are at any given time. A good thermal flyer watches the sky and the other flyers very carefully, trying to establish probable patterns in the lift cycle. This enables him to figure about what part of the sky is due to kick off a thermal when it is his time to fly. Sometimes if there is a massive sink cycle that is killing everyone, just trying a different part of the sky is about the best you can do. In general, unless you have sure knowledge of a thermal do not do your thermal searching way down wind. If you find a thermal downwind, you cannot ride it for long because your plane will soon be blown to the limits of vision. This is assuming that you have a good multichannel glider, sporting an airfoil with a good L/D (ideally with camber changing capability) so that you can get home from most downwind situations. If you do not find a thermal while flying downwind you can find yourself in big trouble very quickly. It is much safer to search for lift upwind or off to the sides.

Under most circumstances, it is best to fly the search pattern at or near the maximum L/D of your glider. This is usually about 3 or 4 MPH above stall speed and 1 or 2 MPH above the minimum sinking speed. Your maximum L/D speed is increased with ballast. For an unballasted *Lovesong* for example, the maximum L/D is about 20 MPH, for a *Lovesong* with 20 oz. of ballast the maximum L/D would be about 23 MPH. The maximum L/D is near but slightly above the minimum sinking speed so if you keep your glider searching at speeds that fall within the range of the minimum sinking speed and the maximum L/D, you will get the most possible air time if you do not find lift and you will cover the most possible sky, thereby affording you the best chance of encountering lift during the flight.

In strong winds, you may have to adjust your strategy. However, in many windy situations there are no standard thermals and you can get better times by flying slowly into the wind and doing a little dynamic soaring by altering your trailing edge (TE) camber at the right instants to gain energy from changes in the wind speed. In these situations, flying fast at a high sink rate in a vain effort to find a thermal is a losing strategy. On other occasions, when there is thermal activity in a windy situation, ballast up and put the TE in the 'move out' position and search the likely thermal spots. With this strategy, you are gambling on finding workable lift. Good flyers will usually make the best choice as to which strategy to use in a particular windy situation.

Watch closely for tell-tale signs of lift within a half mile radius of the field. We all know that a circling hawk, eagle, buzzard or even seagulls can be a dead give-away as to the existence of lift. Small birds like swallows can be just as reliable. They feed on small insects which can become air-born by thermals. When these swallows are darting around in a small section of the sky, they are probably defining the boundaries of a thermal for you. Sometimes you may even be able to spot a column of dust or even debris such as paper or

thistle-down in the air as a thermal indicator. If you suddenly find yourself climbing out on tow higher than is usual for the wind condition, you have probably encountered a thermal on tow. Go for it!

Wind shifts are another thermal indicator. A sudden temporary shift in the wind direction can indicate that a thermal is nearby and is sucking the air toward it. If the air suddenly warms and the wind dies, you may be standing in the 'eye' of a thermal. Sometimes you can see wind patterns in nearby tall grass that indicate multiple or circular wind directions, another thermal indicator.

Look for variations in ground cover and terrain. Areas that are dark will absorb heat faster than surrounding lighter colored areas and so will be likely areas to kick off thermals. Ridges can also help thermals break loose if there is a little wind. A slope facing the sun is another possible thermal generating area. We all know about the old standbys such as: parking lots and dark roofed buildings. If nothing else you can always try to slope soar off of the windward face of the buildings or a well defined tree-line.

Two of the most difficult things to learn in thermal flying are being able to recognize what lift is workable and then how best to work it. In general, as you all know, thermals start at the ground and spread out as they go up in a funnel shape. Then, the funnel goes down wind as it rises. The wind also blows the entire funnel down wind usually including the base of it. When you are climbing out in a small thermal at low altitude and following it down wind and it suddenly disappears, if you cannot re-center in it, try flying back to the spot that you first picked it up. The generating spot may be producing a thermal that breaks off down wind while the original spot is sending up another column.

If other planes are in a thermal and they are higher than you are, you should

look for the thermal upwind of the higher planes. You will normally have to follow the thermal downwind or else it will blow past your plane and you will end up on the down side of it. You'll want to get out of the down air fast. When you are high, or when working thermals that do not seem to have a noticeable core or 'hot spot' it is usually best if you work them in flat efficient gentle circle turns. Some thermals have tiny areas of strong lift that can best be worked by standing the glider on its wing tip while doing tight, fast 16 foot diameter circles centered in the "hot spot". This is the only way that you can climb out on some thermals, particularly at very low altitudes. Some gliders perform more efficiently than others in tight circles (this is one of the many aspects of performance that gets top priority in the kits I design). Other thermals seem to require that you fly an upwind climbing leg slowly and on the verge of a stall (not quite letting the plane stall) while whipping around the downwind turn quickly at a faster speed. At low altitude one stall or false move can spell the difference between a max flight and a premature landing. How you fly a multichannel glider through the turn is of utmost importance.

If you know that you are in lift but you are not climbing or you are not satisfied with your rate of climb, try varying your thermal technique to find one better suited to that particular thermal. also, be quick to re-center if your climb rate decreases. At altitudes under 30 feet, you can't afford to waste a move. So if you are not losing altitude with a thermal turn, you should probably stick with it. Many times if you fly out of a bubble, you can't find it again even if you have the altitude to try. Don't leave a productive thermal turn, especially at low altitude but you can try shifting the center of the turn slightly while you circle to find the 'hottest spot' for maximum climb. Keep in mind that some thermals disappear quickly so it is important that you concentrate all of your efforts to climb to a safe altitude as rapidly as possible. Don't relax just because you have found a thermal. This is not the time to start BS-ing with your timer or to casually saunter over to the landing

circle. Climb fast! You may only have one chance and a few precious seconds of good lift. Take advantage of it while you have it.

In general, a thermal will try to turn the plane away when it encounters lift so be quick to force the plane to turn into the lift. You may have to try several different circle locations before you are centered in the thermal. Some thermals even seem to have centers that shift, requiring you to re-center your plane several times during a flight. If you stop climbing, try to find a more productive area of the thermal while being careful not to lose the thermal. If you can't do better in that thermal, then get out of the dying thermal quickly and find another one while you have the altitude to do so.

There are some occasions when a fixed area is generating lift which you can't work well by any type of thermal circle. Sometimes these may be called 'waves' and they may be produced by wind after it has blown over a hill or ridge in a harmonic of the original air pattern caused by the hill. At any rate, smooth gentle flying with minimal control input is the best way to fly this type of lift if it is weak and smooth. Fly large flat turns and figure 8's to stay in the lift area but make as few turns as possible.

The best type of plane for thermal flying depends upon the skill level of the flyer. For beginners, a self-neutralizing polyhedral floater like a *Gentle Lady* is a good choice. As skills increase, then more versatile and higher performance gliders are called for. The top flyers and soon-to-be top flyers will find more room for growth and more possibilities in difficult situations if they are flying a high performance multichannel glider. This is how I felt when I came out with the *Todi* in 1972 and this philosophy has guided my designing right up to the design of our new *Saber*. With so many great flyers flying good multichannel machines now, you are really handicapping yourself if you stick with your polyhedral type glider too long. One theory is that if you fly polyhedral for more than two seasons, your brain atrophies and you then

are unable to make the jump up to serious multichannel flying (I said it was only a theory come on — lighten up!)

Having the best plane, however, will do you little good if you have not mastered the ship. The more sophisticated the glider is, the better you the flyer must be in order to harness the added capability. Become so familiar with it that your glider feels like an extension of yourself, and you don't even have to think about the mechanics of flying it. This frees your mind to help you fly each lift opportunity almost on instinct as your thermal skills increase.

One of the most important things to remember is that altitude is time and distance in the bank. Practice your tow technique until you are getting the highest tows that you can possibly get. Use a Casio altitude watch to compare how high you get with various launching techniques and stick with the launch technique that gives you the most height. You have all seen great last ditch saves where a flyer thermals out from a 30 foot high final approach. You may call this good flying but in most cases, if the flyer had flown the early part of his flight better he would not have had to rely on a last minute save. The most important part of a flight is the first minute, when you are the highest and your options are unlimited. Have a plan of action before you launch, based on your skilled observations over the half hour prior to your flight. Come off of tow aggressively. Don't give up a foot of altitude unnecessarily. When you are high and just off of tow, do not get sloppy! Fly as if you were only 30 feet off the deck. Do not waste this important part of your flight worrying about getting to the landing area. After you launch, move quickly away from the winches and then stop and concentrate on your flying and on your pre-decided strategy for finding lift.

Pick a timer who understands finding and working thermals. He should not try to fly your plane for you but he should concentrate on watching the entire sky and all the other gliders and signs of lift. You want a timer who knows

thermal flying well enough so that if another glider flies through lift (even if the other pilot doesn't know that he has flown through lift) your timer knows it and can tell you about it. It is important that your timer knows your capabilities as a flyer as well as the performance range of your glider. Several times, I have found myself timing for a polyhedral flyer and have spotted a thermal for him within easy reach. To my chagrin, he made too many turns before heading for the lift or his glider just did not have the sky covering ability that I was used to or he chickened out just before he reached the lift and so my advice only messed him up. I knew that my glider and I could have easily reached the lift without a second thought but I learned that when I am advising someone else, I must take their skill level, flying style and glider performance into account if I am to help them. A good timer is a most valuable asset, but some top flyers become so dependent on their timers and advisers that you begin to wonder if they could actually even fly without their entourage. Thermaling 'by committee' is one way to do it but I have more respect for flyers who can do it on their own even if their groupies are not with them and even if they have an unfamiliar timer.

Perhaps the one thing that really separates the great thermal flyers from the okay thermal flyers, is the ability to immediately recognize when to stay with a thermal, when to leave it and when to re-center in it. How many times have you seen a gaggle of flyers slowly circling down to the ground in what was a thermal only minutes before. The smart flyer left the thermal as it was breaking up and quickly and decisively went in search of another thermal while still high enough to do so, thus saving his flight. If a great thermaler encounters sink he will recognize it immediately and will not waste precious altitude floundering in it. One of the hardest things to do, when in sink, is to reflex the wing trailing edge and pour in down elevator and thus increase your apparent sink rate to get the plane moving fast so you can fly out of the sink as quickly as possible. Fly anywhere just get out of the down air.

Whatever you do, do not retrace your flight path and fly through the same down air that you have just flown through. Anything is better than that!

Great thermal flyers are decisive, smooth and attentive. They can work any air within a range of half a mile or more, speeding out of sink and maximizing any form of lift. The great thermal flyer expects to get his time whenever he goes up and he doesn't give up until he is on the ground. Climbing out at 15 feet of altitude is not an uncommon feat for the skilled thermaler be it on final approach or elsewhere. It is a common sight to see great thermalers like Dave Banks thermal his *Lovesong* or *Saber* out from a hand toss.

If you have the basic skills and the best thermaling machine to fly, you can spend a lifetime improving your thermaling skills, learning to work lift that you could not work the year before or even the week before. You will find your decision making improving so that you can now salvage 'max' flights out of air that is eating everyone else alive. The thrill of thermal competition flying is that there is no end to how far you can go, each flight is a totally new challenge to be optimized. The person who best optimizes each flight opportunity is the one who wins the most contests. This personal growth in thermaling skill is to me the ultimate and ever-new thrill and joy in soaring.

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As part of RCSD's arrangement to publish Bob Dodgson's autobiography in a series of article, he kindly afforded us the opportunity to publish (or in some cases, re-publish) his past articles. This will be the first of many. Read the [next article](#) in this issue of RCSD, return to the [previous article](#) in this issue or go to the [table of contents](#). A PDF version of this article, or the entire issue, is available [upon request](#).