

# DETECTING THERMALS FOR FREE FLIGHT HAND LAUNCHED GLIDERS

(OR HOW TO TROUNCE THE OPPOSITION)

An abbreviated version of an article posted in 2003 on [www://f4bscale.worldonline.co.uk](http://www://f4bscale.worldonline.co.uk), a site which is no longer available

The first objective of any model glider flier is to have a model that flies well, once the model is trimmed for perfect flight the next objective is duration.

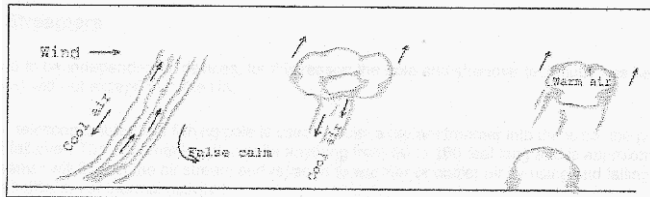
If you are flying on a local park you won't want the model to go too high or too far, but competition HLG fliers strive to achieve at least one minute duration - a 'Max' - (*Ed. Note: perhaps that was the "max" in England in 2003*) for each and every flight (hardly ever achieved), so how do they do that?

Answer: By 'picking lift' - launching into Thermals.

Thermals are very elusive, they are visible to all and sundry as we casually lean back in our folding chairs, but as soon as you venture forward for a competition flight with model in hand, they will collapse before you like soap bubbles popped by a fickle finger!

A thermal is warm rising air which (hopefully) will carry your model to a great height. There has always been some debate as to the actual shape of thermals. Thermals are said to be either columns of warm rising air, doughnut shaped bubbles and some fliers perceive them to be large bubbles of warm air which form at ground level then break away to float skywards. It may be that thermals are large columns of warm air with a cool (downward flowing) core, centring on a thermal is a common phenomenon, if a free-flight model centres on a thermal the result is a downward almost vertical spiral which is often terminal!

Whatever shape thermals are - you will want your glider to be in one! There are many variables that are involved in producing thermals ie; air pressure / cloud formations / sun intensity / wind strength / the surrounding terrain, the list goes on!



What the surrounding countryside looks like and the amount of thermal activity it may or may not generate is not something that the would be 'maxer' should trouble themselves with. All competitors on the day will experience the same amount of thermal activity. What we need to be able to do is to 'pick the lift' as and when it arrives at our launch point. Picking or spotting the lift will give us distinct advantages over those fliers who have no knowledge of detecting thermals and launch as and when they have the urge!

How do we do go about finding the lift ? The first and obvious way is to stand next to a competitor of known pedigree and launch at the same moment as he/she does (commonly known as piggy-backing ). I don't recommend that method. The flier you are watching is sure to be aware of your strategy and may try to lure you to launch into 'sink' — definitely not recommended.

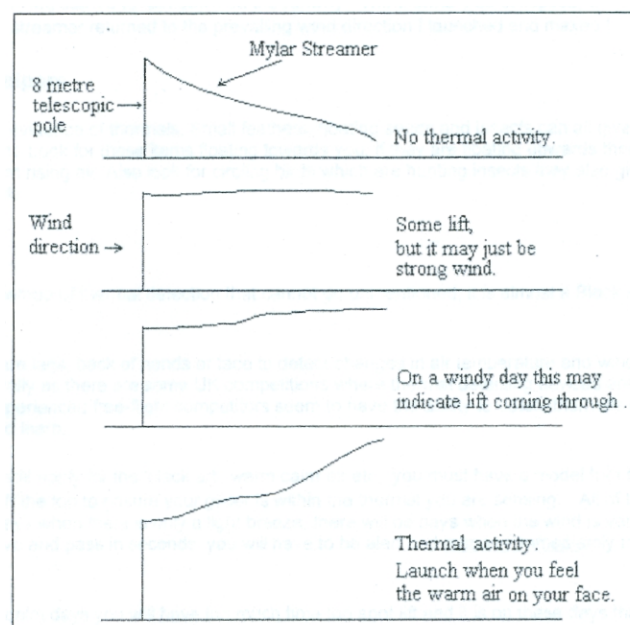
I must point out that thermal picking is not an exact science and many an experienced flier has been seen with head in hands as his models wallows slowly earthwards in a patch of 'sink'. Even experienced fliers get it wrong from time to time.

We will assume for the sake argument that thermals are columns of rising air. As this column of warm air rises, cooler air will precede it and a cool air will rush in the fill the space previously occupied by the rising warm air. There are strong thermals, weak thermals and patches of air that give the appearance of thermals but collapse moments after launch. We can't see thermals, so we need some means of detecting them and avoiding the down drafts.

HLG fliers need to be independent of devices, for this reason the pole and streamer technique has been developed and used almost without exception in the UK.

An eight metre telescopic fibreglass fishing pole is used to hoist a Mylar streamer into the wind, the pole is then fixed so that it can't fall over. The streamer length can be anything from 50 to 100 feet long and is approximately 10 mm wide. The streamer will float in the air stream and respond to warmer or cooler air by rising and falling. Giving the 'perfect' visual indication of thermal activity !

Now dear reader, I am assuming that you have just run out of the house and have bought, begged or borrowed an eight metre telescopic pole and mylar streamer!



At your local flying site erect the pole and streamer at least 60-100 yards upwind of your chosen launch position and watch the behaviour of the streamer as it rises and falls [and feel for the] warm air on your face) and attempt to launch into lift. Chances are that you won't have immediate success, you

probably launched into a down draft. The reason (in my experience) is that thermals do not rise straight up, they come along in inclined columns. The size and shape of these columns depends on wind speed, cloud formations and the strength of the sun. You alone will have to decide at what moment you are going to launch, wait for the warm air to reach your position, remember that the streamer is only an indicator, you must continue to 'feel' for the warm air. Launch too soon and your glider will be pushed down in front of the lift, launch too late and your glider will wallow in the down draft.

The strength of your throwing arm and type of launch pattern your model follows will also determine the moment of launch that is correct for you. If your glider has a vertical climb with a roll-off the top then launch in the centre of the thermal, if the glider has a right/right launch pattern, position yourself to the left of the pole so that as the glider finishes its transition to level flight in the centre of the lift, Now watch the streamer again, it will rise and fall as the warm air passes, it will also rise and fall as the wind strength increases or decreases, so can we rely entirely on a rising streamer to show thermal activity ?

Yes we can, because it is generally accepted that a combination of a drop in the wind speed, a rise in temperature and a rising (upwardly fluttering) streamer indicate a strong thermal - wait for that combination and LAUNCH! Be aware that it also possible to launch to the side of any lift that comes through, your position relative to your pole is most important. A row of three upwind streamers can indicate three very different situations.

Do not be fooled by swirling air, if the streamer changes direction by 180 degrees and indicates strong lift by fluttering at a steep angle - ignore it, in my experience it will collapse moments later, wait for the streamer to return to the prevailing wind direction then launch.

This swirling air phenomenon once occurred at a UK Nationals championship. Everyone was waiting for the usual signs of thermal activity. The wind began to swirl and changed direction. The streamer went up at an incredible angle, there was almighty rush of launch activity, more than a dozen models were launched, I tried to get the attention of my timer who seemed transfixed in her chair, after repeated arm waving from me she still didn't acknowledge my signal, I turned to walk towards her, as I did almost without exception all the gliders that had launched started to rain down on the runway! The thermal had collapsed, the best flight was about 12 seconds. As the streamer returned to the prevailing wind direction I launched and maxed !

Nature can provide evidence of thermals. Small feathers, floating seeds and insects can all give clues as to when thermals are present. Look for these items floating towards you, if they are floating upwards then you may be sure that they are in warm rising air. Also look for circling birds which are hunting insects they also give away the presence of thermals.

Now there is one method of thermal detection that cannot go unmentioned, it is almost a Black Art - the use of your legs!!

Using the skin of bare legs, back of hands or face to detect

changes in air temperature and wind speed has many advantages, especially as there are some UK competitions where thermal detecting devices are forbidden. Only the senior and more experienced free-flight competitors seem to have the ability to detect thermals using their legs, so watch them well and learn.

All the above rules still apply for the 'black art', warm calm air etc., you must have a model that has a vertical launch pattern with a roll-off the top to ensure your glider is within the thermal you are sensing. All of the above advice applies to perfect days when there is only a light breeze, there will be days when the wind is very strong, on these days the lift will arrive and pass in seconds, you will have to be alert and respond immediately the moment you spot the changes.

Conversely, on flat calm days you will have too much time too spot lift and it is on these days that you are most likely to pick false lift - the type of lift that collapses seconds after it formed! only experience will help you get around that problem.

**To reiterate** :- Wait for the wind to ease off, if the wind temperature rises and the streamer also rises - launch.

Remember, mother nature wrote the rules for thermal generation and she rewrites them as and when she chooses — be warned!

Good luck and happy flying.