

Five Years With a Powered Harness

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Hanging out in lift below a cloud with the engine off

My two main flying partners of 20 years both retired from the sport. My main flying site, which would often see as many as 10 or 15 pilots on a good day, now has only a handful of flights in a year. And it seems every year there are more demands on my time.

In early 2001 I bought a Swedish Aerosports Mosquito NRG. While powered harnesses (PH) are not for everyone, I know that without mine I would no longer be an active hang glider pilot. I would like to share what I have learned in these past five years regarding the compromises and trade-offs involved. Pilots vary widely in preferences and opinions and only the individual pilot can decide how it balances out for him or her. Cost is considerable - new units are \$6,000 and up. During flight there is more complexity, additional weight, handling changes, and general coaxing and maintenance of a small 2-cycle engine. And yes, there is noise.

On the other hand, imagine being able to fly *and* have a life. No crew required, and your flying site could be as close as your back yard. Wind direction is much less

important, and you can soar sites that were previously inaccessible. There is less pressure to fly on a given day because you don't have a long drive (and probably a whole day invested), so it is easier to make decisions in favor of safety rather than airtime. If your field is close to where you live, you can often assess the conditions without ever leaving home. If the wind direction changes, depending on your field, it may not matter. And once you are set up you can do multiple takeoffs and landings with ease.

A recent convert to a powered harness, Bruce Decker of Colorado, posted one of his flying days on a discussion list. He took off from his backyard at 7:15 am to motor over to a pancake breakfast at a nearby airport. He took off again after the breakfast, this time in thermic conditions. Shortly after gaining altitude he was able to shut off the engine and had over an hour of soaring flight on his way back home. He landed at noon and went to his son's track meet at 2 pm. If you are thinking that sounds like a good way to spend a day, then you may want to consider a powered harness.

I asked other owners "what do you wish you had known" when they bought their harnesses. What



Launching at the local airport

follows is condensed from those replies and my own thoughts:

Flying

I have written two previous articles about powered harnesses (Oct '01 and March '02) so I won't go into the details of the changes in bar position or launching technique here. Those articles are online on my website (see Resources at the end for the URL). A summary is that good Flat Slope Launch skills are required, and you will find that the control bar trims at a lower position relative to your body. There are about 40 pounds of added weight with a PH, much of which is below your feet, so you will feel less nimble in turns. Personally, I found these changes easy to adapt to. I always fly relative to the glider trim position, so I hardly notice the difference in bar position. With the extra weight I also have more roll authority.

When using the engine there are more changes. The glider has a greater tendency to want to 'wind in' on turns, and on a thermally day, at full throttle, it can become a bit of a wrestling match. However, learning new techniques can make things a lot easier. With any of the prone PH models you have a variable thrust line - it can work with you or against you. That is a complex topic, but the very short version is that some old habits of flying (like leading a turn with your feet) can be counter-productive with a powered harness. But by learning to use the thrust to your advantage you can make the handling a great deal easier under power.

Performance

Most pilots are familiar with Density Altitude (DA) which increases as air density decreases. Unpowered, this means that you must run faster to launch and will land at a higher speed. The effects become more noticeable with power. To simply maintain altitude at a constant angle of attack requires *increased* power when DA increases (because velocity must increase). At the same time, *available* engine power *decreases*. Those two values can come together surprisingly fast. Conditions that might make for an easy takeoff at 70F can become surprisingly hard at 85 or 90F.

First generation PH's all used the same Radne 120cc motor. It is an engine with a proven record and is sufficient for flying at DA below 4-5000 ft (at 2000 ft actual elevation on an 85 degree day the DA is around 4500 ft). For pilots at higher altitudes, however, attempts to fly have spawned jokes about Salad Shooters.

That is changing. A new US entry, Hidden Mountain ("there is a mountain hidden in your back



The training hill where the author first learned to fly 25 years ago - it was his dream most of those years to be able to see it from this vantage point.

yard”) has introduced the X1, which has significantly higher levels of power. This has made takeoffs routine at much higher DA levels (10,000 ft DA and above). Other manufacturers are offering improved tuned exhausts and other modifications.

At it’s best, however, a powered harness is a low power compromise between powered and free flight. If you only want to motor around, you probably won’t be happy with the relatively slow climb rates of a PH - better to consider a trike or other ultra-light. A powered harness is best thought of as a self-launch device for a hang glider. It’s best use is to simply gain enough altitude to start working whatever lift is available,

although on a stable, calm day, it can be fun to motor around and see the sights.

Mechanical

Powered harnesses use small 2-cycle engines. That means gasoline, oil, spark plugs, and regular maintenance. The motors are reliable mechanically, but they still require fiddling. Vibration loosens things. Fortunately that is confined to the power harness, as the hang strap is effective at isolating the glider from the vibration. Carbs need adjusting and things wear out or break. Some pilots become involved in tuning their engines with carb and exhaust modifications (to increase power and reduce noise). The point is, you will not be spending all your time flying. But you will be saving time driving to the mountain, and airtime will be easier to come by.

Other Pilots

One pilot wrote “The most surprising thing I found out about (powered harnesses) that I did not expect is how much negative feedback I would receive from having so much fun.” I have experienced this as well. I realize many pilots are offended by the noise, and I have chosen not to fly anywhere that I don’t feel entirely welcome. Besides, there isn’t much reason to. If I drive all the way to a mountain site I would prefer to free fly. I use power to fly closer to home and in a wider range of conditions. So the strength of some of the reactions has surprised me.

Some pilots object to it as being “unpure” or cheating. I’ve heard comments such as “driving mindlessly around the sky”. I guess I can understand that, although perhaps if they tried launching from the flats on a warm, light wind day they might rethink the “mindless” part. And for me the cost of remaining “pure” would have been leaving the sport. Using the PH keeps my skills current - if I can launch from the flats in challenging conditions, then a mountain launch - for those rare free flying opportunities - is easy.

Social

The social aspects are what I miss the most. I fly by myself. I wish it were otherwise, and if enough people started using PH’s, it could be great. It could be like some tow parks, where you can make it



The area has many ridges, all tree-covered, with few roads to the top. The powered harness has allowed access to many of these that were unavailable before.

a family affair. Fly for awhile, come back and eat lunch, visit with the spouse, and take off again. Except you don't need a tug or crew and don't need to wait your turn. Or you could plan a group cross country trip where you know you will be flying together. Shut the engine off and thermal when you can, but if you hit a sink cycle, use power until you find lift again. The Brits and French have been doing week-long touring bivouacs with powered harnesses for several years now. I'd love to do that sometime. So what if it is "unpure" and "cheating" - I'm of an age where I no longer have anything to prove. I only have rare opportunities to fly, and when one of those come along, I want to fly, not be frustrated by the conditions.

Safety

Although I reach this conclusion cautiously, I am coming to believe that a powered harness is a comparatively safe way to fly. There is the spinning prop, which could be lethal if a mishap sent prop pieces flying, but that is common to any form of powered flight.

The majority of accidents I know of result in equipment damage rather than injury. You are usually taking off on flat ground, and most powered harness mishaps happen during launch, often without leaving the ground. As long as you have wheels, even most "blown launches" simply result in grass stains and a red face.

A number of pilots commented that they feel much safer taking off with a powered harness than by any form of tow launch. The forces are lower and you are in complete control of them. You control

the direction of the force, without having to follow a tow line or worry about tug position. If you get turned by turbulence, you can simply continue flying in the new direction, so long as there are no obstacles. If things go wrong you simply spit out the throttle - no need to fumble for a release.

A major safety consideration is simply having a large enough field that is free of obstructions. You can't afford to depend on any assumptions about how fast you will climb or that the engine won't quit. You need to have a way to turn or land at all times.

Final Thoughts

For myself, buying a powered harness is one of the best flying investments I've made since I bought my first glider. The first few times I launched a hang glider from *flat ground* brought back that same sense of magic I experienced 25 years ago when I took my first flights. It still feels like magic, and has added new dimensions and wonder to my flying, while taking away nothing. I am still able to free fly whenever I have the opportunity, but now I've added many more opportunities and conditions for flying. I have been cloud hopping while pilots 20 miles away were sitting on a mountain top kicking rocks hoping for the wind direction to change. I have finally been able to fly 'sites' I have looked at for years, but that had no road access or launch. And yes, I have just motored around under a layer of stratus clouds in glass smooth air enjoying the sights. And even then, the flights ended with a quiet sled ride.

Resources:

Wind Drifter has reprints of my earlier power harness articles, as well as discussions of the effect of power on handling, links, and other information. There is also a current list of manufacturers:

<http://wind-drifter.com>

Flphg (foot launched powered hang glider) Discussion List is a friendly place with a world wide body of knowledge about powered harnesses:

<http://groups.yahoo.com/group/flphg/>