



The Golden Knights 4-way team jumps into the air column.



The Knights over the flying area.



Three of the jumpers practice vertical rotations.



A jumper flies several feet above the net.



A view of the tunnel outlet and the flying net and walkway above it.



The tunnel opening from below the net.

suit for freeflying. The power of the tunnel, along with its outdoor environment, made it seem just like freefall. There are a series of lights on the floor of the projection point, so a flyer looking straight down has no problem staying in the column of air. I think head-down freeflying would be the easiest thing to do in this tunnel.

My team had the most fun seeing how high we could “bootie fly” above the net (where we sit up with our lower legs more or less parallel with the ground so that our

jumpsuit booties catch a lot of air.)

Another fun feature was the ease of the verticals in the AAC. We were able to do three-man over-and-under rotations quite easily.

We had a lot of fun testing the limits of the tunnel and some of my teammates intend to return to the AAC with their families. It seems great for a fun afternoon with the family, especially for those who already jump. □

## A Talk With Designer Chris Landon

My team had a great time comparing wind tunnels and I learned a lot about tunnel design and production. I was able to ask owner Chris Landon a few questions about his new tunnel.

### Why did you build the tunnel?

I fell in love with flying, and came up with a unique and superior (wind tunnel) design, so I had to build one. Since it's the best available to the public, and perfect for 4-way teams, we feel that skydivers will come to our facility when word gets out.

### When did the tunnel open for business?

The first flight was in December 2003. We started flying customers in August 2004. At this time we are open to experienced skydivers and wind-tunnel users who schedule in advance via email. We also fly beginners who schedule through John and Dawn Suiter (the tunnel's instructor and manager). John Suiter is an excellent instructor. In the spring I plan to start hiring more instructors and be fully open by April.

### How much does it cost to fly in the tunnel?

We are charging \$600 per hour for flight time. Customers can book blocks from as little as 10 minutes. Customers who buy larger blocks can take breaks. For example, a person can buy an hour and fly it in three 20-minute blocks.

### What are its best features?

It has a very wide wind column that is very uniform and smooth. It is quiet, very fast and has a very soft net. A skydiver told us recently that our machine is no louder than the sound of freefall.

### How is it different from other designs?

Our machine uses a single large, custom-designed fan. It resembles a large industrial wind tunnel and uses a unique patented method of turning the air vertical that creates a very smooth and uniform wind column. Our design is completely scalable. It can be produced for any practical diameter and airspeed. It can be produced as a completely open machine like at Appalachian Amusement Center, as an enclosed flight area resembling the Ft. Bragg tunnel, or with an integral tube. It is possible to make it change configurations, for example, a removable tube.

We are ready to build machines. We have sold one that will soon start construction in Texas.

Our design is solid as a rock. The fan is remotely located. A fan failure cannot send high-speed shrapnel toward the flyers. Anything dropped or lost in the wind cannot strike any moving parts. The air is filtered, and always fresh. In a re-circulated design the air becomes more and more stale, with fabric fragments and other types of airborne dust and foam. And, of course, it heats up.

The airspeed or power consumed is not affected by flyers in the wind. It stays constant as more flyers enter the wind or depart. And you can fly up 20-plus feet and the air is the same.

Watching video of the Golden Knights flying, I could see the visual reference problem. But I was also seeing the 4-way group start out on one side and slowly drift to the other side during 10 seconds. The whole group could move four feet from side to side. It makes the diameter look great for 4-way.

### Since this is an open-air wind tunnel, will you be open during the winter months?

We are finding that it is fun and exhilarating to fly at 45 degrees F. Diehard flyers seem comfortable at 30 degrees. The colder it gets the faster the air feels at a given RPM, and it feels more like skydiving.

In our location it is only 30 degrees or colder for a week at a time, two to four times a year. Just last week a two-week run of 60 degree days ended. Today was about 55 degrees.



Chris Landon (left) and Ben Stone.



Ben Stone next to the fan.



The fan blows the air into a circular room. Fins located around the bottom of the tunnel (lower right) then catch the air and push it up through the air chamber.



Some of the tunnel crew stand in the air shaft.

We have flown in the rain in cold weather. We have had an instruction session in progress when it started raining for 20 minutes. Instructor and student never knew it was raining. It isn't too hard to dress for cold weather flying.

We expect to stay open in the winter, although probably not at night.

### What is your background?

I got my pilot license, single, multi, glider and helicopter in the 1970s. I have been a photographer, audio-video and film specialist. Twenty years ago when I moved to North Carolina, I started flying at Flyaway (in Tennessee). I worked there for eight years as a controller, instructor, supervisor and manager.

(Landon said three other primary people contributed to the design and construction of the tunnel: Ben Stone, Harold Larsen and Mike Ashe. Larsen is a retired professor of aerospace engineering who contributed to the general design aerodynamics for the wind tunnel. Stone was involved in the testing and structural design. Ashe was construction foreman, and now operates the tunnel.) — John Hoover