

Henry Parker  
htparker@umich.edu

## HENTS A SHARED CAMPING EXPERIENCE

I failed as a boy scout. I was too impatient to learn how to tie knots, and my box car never won, but for me the outdoors and camping was not about if I could make a fire in the rain. Instead camping was about creating experiences to share with friends. *Hents Hammock Tents* aim to do just this, elevating the camp experience through modularity and allowing users to focus on what really matters.

Growing up in the backwoods of Georgia, my friends and I would fish after school and through the summer. We would hike to the same spot every day, cast out our reels, and relax in the sun. We brought snacks, music, and a hammock that we would hang from the trees on shore. This became a tradition that we continued every summer and one that I would look forward to. As we grew up and were able to drive, we began to broaden our horizons, exploring more distant fishing holes and would occasionally camp overnight. To allow for our occasional overnights, I asked my parents if we could get a tent. Wanting something cheap for that weekend, we bought a massive eight-person Coleman tent. It worked great. But as the summer went on and friends left for vacation, we wouldn't always need an eight-person tent. Its size and lack of versatility became a burden, and instead of bringing it along we would often opt for leaving it at home.

These problems resurfaced when I was trying to pick a tent for a camping trip I was going on this past summer. Not having a ton of space in my apartment or a large budget to spend, I wanted a piece of gear that would solve all my problems, all the while taking up less space in my pack. I realized that 90% of the time, I only wanted to day-hike rather than camp overnight, and I didn't need a tent except for the one weekend I had planned to camp out overnight. Most of the time, I just need my hammock and two good trees to relax in on a nice day after class. While

looking for a solution to meet my needs, I was surprised with the lack of options for the frequent day hiker like me. The options that did exist were expensive, clunky and all designed for single person use instead of a group. If we purchased these, each of my friends would have to bring their own shelter.

I wanted a piece of gear that would adapt to the occasion: for example, I may want a hammock today, but a tent tomorrow. So I decided that it was possible to design and create my own shelter. It would be designed to meet all of my requirements, but the product would be intuitive enough so that if I gave it to my friends for the weekend, they could set it up without me. I believed the system could be inspired by a hammock that would use modularity in a way that allowed the user to take one hammock and connect it with a second hammock to create a fully-enclosed two-person tent. To simplify it further, each half would be identical, so users could avoid the issue of setting it up with a wrong half.

In an attempt to better understand the market, I looked to examples of different modern and historical shared and emergency camping solutions. What I found is listed below:

The Poncho Tent is a practical design that has been around for a decades, but has just recently seen fresh media attention. Just recently on Kickstarter, the project “ADIFF”, seen in Fig. 1, has received media attention due to its social cause. Similar to Toms, the shoe company ADIFF will give a piece of clothing to a refugee for every piece of clothing sold<sup>1</sup>. Right now, the main product they sell is a reversible jacket that allows the



Fig.1 ADIFF Poncho Tent

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<sup>1</sup> "WHAT WE DO." ADIFF. Accessed April 19, 2017. <http://www.adiff.com/what-we-do/>.

wearer to choose if he would like to be seen or not, with the exterior being reflective and the interior shell being made of a non reflective matte olive drab. Their other product that has been popular is a social commentary piece: a poncho that can be unzipped into a tent.

Six Moons Designs<sup>2</sup>, seen in Fig.2, came out with the similar product in 2006, but they were not pursuing an aesthetic or social cause; instead, they were focused on extreme functionality. I would consider this a niche product to be used only in emergency situations, because when the poncho is stretched into a tent form, it does not have a floor.



Fig.2 Six Moons Designs, Poncho Tent

Before Six Moons Designs, the military produced similar ponchos that could be used with two tent poles to create a tiny safety shelter. They were often used in “Lean To” (half exposed) setups or fully collapsed when attempting to hide from enemies. This solution was also designed for a strictly emergency survival function.

Similarly, the US Army personal tent, also commonly referred to as the GI Pup tent<sup>3</sup>, was designed for survival. It has been upgraded over the years, but the shelter has remained essentially unchanged. You can see the simplicity of this shelter in Fig. 3. The shelter is made up of two waterproof halves to protect you from the elements, and collapsible trekking poles. The system is



Fig.3 GI Pup Tent

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<sup>2</sup> "Gatewood Cape." Six Moon Designs. Accessed April 19, 2017. <https://www.sixmoondesigns.com/collections/raingear/products/gatewood-cape?variant=27464616968>.

<sup>3</sup> "U.S. Army Tent: Shelter Half." Shelter Half Pup Tent. Accessed April 19, 2017. [http://olive-drab.com/od\\_soldiers\\_gear\\_shelter\\_half.php](http://olive-drab.com/od_soldiers_gear_shelter_half.php).

issued as two halves to individual soldiers, with the expectation that each soldier will have a friend in which to create a whole shelter with. If the soldier can't find a companion, the kit can still be used as an individual "lean to" style shelter.

My original design and concept, seen in Fig. 4, was primarily inspired by the GI Pup Tent design. It was simple and worked, but there were a lot of user comfort and practicality issues that I found through testing, and for my final prototype, I moved away from this style of shelter. Here is a list of some of the roadblocks I



Fig.4 Prototype #1 Testing

encountered, which I attempted to troubleshoot in my final design:

**1. Fabric layering:** I was using a double-layered hammock design to protect from the elements when inverted for tent form (Interior: diamond grid ripstop/ Exterior: PU coated silpoly). My biggest worry at the time was that the two layers would feel like you are suspended in a hot pot because the exterior fabric had no breathability. In an attempt to design around this, I cut the breathable ripstop narrower than the exterior non-breathable shell so that when the user was suspended in hammock form they would be lofted off of the waterproof fabric. To allow heat to escape I incorporated side entry ports that doubled as spots to insert a sleeping pad between the layers. I believed this would aid in letting heat and moisture escape.

**2. Waterproof Breathable Fabrics (WPB):** To fully mitigate the heat issue I considered using WPB fabrics. Unfortunately from research and talking with fabric distributors I found that current WPB materials have not yet been designed in a way to support the human body and retain their WPB characteristics. Gore-Tex<sup>4</sup> specifically believed using its fabric in this way

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<sup>4</sup> "What is GORE-TEX® Fabric?" GORE-TEX®. Accessed April 19, 2017. <https://www.gore-tex.com/technology/what-is-gore-tex>.

would destroy its laminated membrane. At the time I was waiting for some personal fabric samples to test their beliefs for myself, but in an attempt to meet the final deadline (April 5) I decided to avoid using waterproof breathable fabric in the final prototype. The possibility of it not retaining its material properties, and the fabric cost per yard made it an impractical material choice for that stage of development.

**3. Connecting two hammocks together:** Other issues that arose from prototype #1 was the way in which the two halves would connect. In the first prototype I wanted to explore the possibilities of using toggles and snaps as the way to join the two hammocks together. While it worked, I found the interaction with the system in setup/takedown messy, and time consuming especially in the dark. I realized for ease of use that the final prototype would have to use a zipper to connect the two halves.

#### **The mistake prototype:**

In between my final and original design, there was one more prototype I feel I need to note. Reflecting on prototype #1, I realize the discomfort and market limitation of creating a shelter without a floor. Spinning of prototype #1, I attempted to concoct a creative way to wrap the hammocks extra material around and under the tent poles to create a floor. I attempted to do this by taking cuts out of the hammock in strategic places to maximize the length and comfort while reducing excess material when wrapped around a pole structure. To keep costs low and better understand how the material would wrap around the poles, I used plastic painters' tarps to prototype the possible forms. This stage of prototyping is seen in Fig.5. Unfortunately, when I



Fig.5 Form Ideation

transitioned back to fabric, I overestimated the strength of the fabric, and after about 10 minutes of lying in prototype #2 the fabric started ripping at the cuts. After this failure, I looked to learn from the all-in-one shelter style below:

### **The all in one:**

Today, there are a handful of companies that produce what I would call an “all-in-one” shelter. These are camping solutions, which function both as a tent and a hammock. A few designs are even able to function in tent form both on and off the ground. Some examples of all-in-one shelter include Lawson Hammocks, Kammok’s Sunda, and the Tentsile Stingray Hammock. While this leaves out a few other brands, this list sums up the different styles that have been approached thus far.

**Lawson Hammocks (Fig. 6):** Lawson is one of the first companies to turn a hammock into a tent. In 1997, they took a traditional single person spreader bar hammock, added poles and attached a waterproof shell over the mosquito netting to keep out rain<sup>5</sup>. The functionality is very simple, when setting up the hammock you add the



Fig.6 Lawson Hammock

poles to the integrated mosquito netting—and ta-da, you have tent that can then be suspended between trees to create a hanging tent. Since its development, there have been a handful of companies that have followed in suit with similar designs. Its draw back is that most of these systems are designed in a way that gives very little headroom. I would consider it barely enough to move around. This type of shelter in tent form is what would be called a “bivy” and looks very similar in style to an above-ground coffin.

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<sup>5</sup> Johnson, Wes. "About Lawson Hammock." Lawson Hammock. Accessed April 19, 2017. <https://www.lawsonhammock.com/pages/about-us>.

**Kammok Sunda (Fig. 7):** The newest of the bunch, the Kammok Sunda, a two-plus person shelter was just recently funded on Kickstarter. It was pitched as a piece of gear that would adapt to anything you needed it for, and it one of the most refined all-in-one camping shelters on the market today. Instead of trying to design a



Fig. 7, Kammok Sunda

hammock that could become a tent, they set out to design a tent that could become a hammock. Turning the equation around allowed their designers to create a system that functioned beautifully in all of its different forms: hammock, tent, hanging tent, and lightweight tarp shelter<sup>6</sup>. Currently, its biggest draw back is that it designed with four separate pieces of equipment (ground sheet, hammock body, poles, and rainfly), which allows for pieces of gear to be misplaced. Additionally, more pieces means it will take slightly longer to setup than the previous solution, but still a standard amount of time for a traditional tent setup.

**Tentsile Stingray (Fig. 8):** The last and most futuristic in style is the Tentsile Stingray<sup>7</sup>. When released this was one of the most innovative and unique pieces of gear in years. Instead of working like a traditional hammock, this uses three slacklines tensioned between trees to create a platform on which to lie. This platform is then outfitted with a pole structure and fabric to fill the space. The whole system creates a fully enclosed three-person



Fig. 8, Tentsile Stingray

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<sup>6</sup> "Sunda." Kammok. Accessed April 19, 2017. <https://kammok.com/products/sunda?variant=34304669703>

<sup>7</sup> "Stingray tree tent." Tentsile. Accessed April 19, 2017. <https://www.tentsile.com/collections/frontpage/products/stingray-tree-tent>.

shelter. Its main drawback is the size and weight of the whole system.

### **Final Development Process:**

Looking to the precedents I reference above, I went back to the drafting table. My goal was to improve upon my original designs by incorporating more of the functionality and inherent versatility of the all in one shelter, while still avoiding the problems I had encountered with taking cuts out of the material.

The final design became what I call Hents (half tents). Hents represents a full two person tent, whereas a Hent is only one half of the full shelter. Similarly to the all-in-one shelters listed above, each Hent functions independently as a one-person hammock and or tent. The advantage of only buying a half Hent is in the ability to keep cost and weight down while camping, if one's only planning on camping alone. Where Hents are different than other products is in their ability to be connected to an identical half creating a fully-enclosed two person tent. Because every Hent is identical, you can buy the halves separately or buy the complete set and not have to worry about a left or right side.

### **What's in the Bag:**

Every Hent is packaged with the one person hammock tent body, a rainfly large enough to encompass the two person shelter, one set of suspension materials, cordage for a ridgeline, stakes, and one tent pole used for one person setup. If you buy the 2-person Hents setup, everything in the package is doubled. Below I explain how the user interacts with each Hent to best enjoy his or her camp experience.

### **Details of Hents Final Prototype:**



When in hammock form, seen in Fig. 9, the Hent looks like a traditional one-person hammock. Its dimensions are 9ft. by 4ft., which provides ample room for one user, and with integrated bug netting suspended from the ridgeline, it provides integrated protection—an amenity that is not standard in most hammocks. On a non-muggy day, the bug netting can be rolled and stowed off to the side.



Fig. 9, Hent in Hammock Mode

To transform the Hent into one-person tent mode, the user un-cinches each gathered end of the hammock and lays out the fabric to be staked. Taking out the pole and finding the corresponding webbing straps, the user bends the pole into the grommets and clips the corresponding c-clips to the pole. In single person set up



Fig. 10, Half Hent

the Hent will look like a chopped in half tent seen in Fig.10. The body of the hammock becomes the floor of the Hent and can be stretched out to create the perfect setup for relaxing in the park. If taking it camping and wanting more protection, the user folds half of the footprint up towards the pole creating a wall and adds the included rain fly.

Going then to two-person mode is simple. With two Hents, Un-cinch the gathered ends and spread them out facing each other. Find the full-length zipper on each half and zip completely up. Next stretch and stake out the corners. A two person Hent is freestanding. Find the second pole, which comes with your partner's Hent, and connect it diagonally (corner to corner), creating an X. From here, the setup is identical to a traditional tent, attaching all of the c-clips up the poles towards the center. Now you will have a fully functional two-person tent, but there is one more step. Take the extra tails from each Hent and pull taut towards one side. When

the tails are matched up in length, roll the extra fabric similar to a roll top bag back towards the center. This prevents dirt, water, or bugs from getting inside the Hent, and when this step is done the setup is complete. You can see the complete Hents in Fig.11.



Fig. 11, Two joined Hents

If the weather turns bad, each Hent is packaged with a rainfly, seen in Fig.12. Each rainfly is designed and sized to work equally well in single person mode and double person mode. In single person mode, the sole rainfly becomes the users fully enclosed protective cover. The same is true for two-person mode. To utilize the second rainfly in two person mode. I have included tie out points so that it can be folded and connected to create a footprint, improving the overall protection of the Hents.



Fig. 12, Hent with rainfly

### **Future Iterations and Reflection:**

Reflecting on my final design, I do not believe it is finished. I plan on continuing to refine and develop Hents throughout my career. I have just accepted a post-graduation position at an outdoor gear company, and working in and being a part of the outdoor community will hopefully allow me to perfect my design. Reflecting on my current prototype, I have list a handful of aspects of my project, which I believe can be refined:

**Ways in which to improve the base connection point between the two halves:** Currently I have daisy chain webbing that runs the full length of the non mesh side (for each half). When the two halves are connected the webbing is joined and rolled back towards the middle (similar to a

roll top bag) to connect and water seal the floor. In the future I would like to come up with a better way to hide or do away with the excess fabric.

**Making the halves truly identical:** As of right now, the halves are identical except for the zipper where one half has both sliders of the two-way zipper. This is a problem because it creates a right and a left half. I have been trying to brainstorm ideas on how to fix this, but all I have come up with so far requires a custom made zipper with a mounting tab on each half.

**One-person tent mode:** In one person mode you are not a fully enclosed by bug netting. I believe there are two options. You could sell an extra slice of bug netting (to create a fully enclosed half) as an extra accessory, or it could be an integrated piece of the fabric (drawback being what to do with the material when set up in two person mode). I will have to decide if bug netting is something that should be integrated or not.

**Expanding Outwards:** I would like the opportunity to explore how to manipulate the current setup to expand into a three or four person tent. I believe the transformation could happen by using two traditional Hents and zipping a strip of mesh material down the middle of each, in a similar manner to adding a leaf to a dining room table.

**Color Possibilities:** I believe having the freedom to buy each half independently would allow for customization in color and pattern between friends, which could provide for unique combinations. Stylistically this would separate Hents from the rest of the market. In future iterations outside of standard color choices I believe Hents could pair with local graphic and fine artists to create visually unique designs.

In summary Hents is about an idea not a product. A Hent only provides the opportunity to enjoy the outdoors. It is how you use it, and who you use it with. I hope this is the just the beginning of a long and exciting journey.

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