

# RED PIMIENTO TO CONSUMER

A Bachelor Thesis by Mendel de Kok

## APPENDIX



# TABLE OF CONTENTS

Appendix	Title	Page nr
A	- <i>Action plan</i> -	1
B	- <i>About Red Pimiento</i> -	4
C	- <i>Drone Infographic</i> -	7
D	- <i>Presentation Markets</i> -	9
E	- <i>Brands &amp; Accessories</i> -	12
F	- <i>List of Accessories &amp; Drone Parts</i> -	17
G	- <i>Brands Offering Backpacks &amp; Cases</i> -	22
H	- <i>Ebay Reviews on Backpacks</i> -	30
I	- <i>Drone Backpack Market</i> -	34
J	- <i>Brainstorm Session with Red Pimiento</i>	36
K	- <i>Field Research</i> -	43
L	- <i>User Scenario's &amp; User Information</i> -	53
M	- <i>Drone Uses</i> -	56
N	- <i>Drone Specifications</i> -	62
O	- <i>Rules on Drones</i> -	64
P	- <i>Backpack Scenario</i> -	66
Q	- <i>Comparison Table</i> -	69
R	- <i>Presentation Drone Accessories</i> -	70
S	- <i>Kids Backpack</i> -	73
T	- <i>Landing Pad</i> -	74
U	- <i>Visuals of Different Kinds of Backpacks</i>	77
V	- <i>Sizes of Popular Drone Models</i> -	84
W	- <i>Ideation sketches</i> -	89
X	- <i>Game of Drones</i> -	90
Y	- <i>Amounts, Sizes and Price Categories</i> -	115
Z	- <i>Production Guidelines</i> -	125

# ACTION PLAN

## From Red Pimiento to consumer

Mendel de Kok - s1315862

### Actor analysis

The client of the bachelor assignment and actual actor is Red Pimiento. Red pimiento is a Productdesign agency for product accessories<sup>A</sup> such as: camera bags, slip-covers, cases and marketing materials. Their overall objective is entering the B2C<sup>B</sup> market (business to consumer ) with their own new product(s). They have an interest in a suitable product for a proper and unsaturated market<sup>D</sup>. The to-be-solved "problem" of this bachelor assignment can be seen as an "opportunity" for Red Pimiento to expand their position from a B2B<sup>C</sup> market to a B2C market.

\*References are explained in the section Concept Definition

### Stakeholders

*The consumers on the defined market:* They have an interest in a good product. The product should match their needs and should be offered in a suitable way.

*Manufacturers of the product:* They have an interest in a clear and achievable instruction for production. Planning, documents and materials must be appropriate.

*Red Pimiento's existing clients:* They have an interest in a clear and reliable service and product quality by Red Pimiento.

*Employees of Red pimiento:* They have an interest in no adverse effects on their work and workload that might be caused by any change.

### Projectframe

The 'higher' goal of Red Pimiento is enlarging their market by delivering directly to consumers. In order to reach this goal, there is a need for a consumer product<sup>E</sup> that fits consumer demands. Currently, Red Pimiento supplies on behalf of companies product accessories and marketing materials, to companies including Canon, Phillips and Samsung. Red Pimiento is expert in 'end-to-end product development. This includes: market research, concept creation, product development, manufacturing<sup>F</sup>, packaging, printing, kitting<sup>G</sup> and logistics. Solutions for entering the consumer market will be sought in offering a product or product-accessory that fits their current repertoire and their envisioned target group<sup>H</sup>. The general production<sup>I</sup> proces will be kept in their own hands.

### Goal

The company Red Pimiento delivers B2B packaging products, bags, cases and other product accessories and wishes to enter the B2C market with a new product of their own design. Therefore, the goal of this assignment is to design a product proposal that is appropriate for the consumer market. The product should suit Red Pimiento's repertoire and respond to an unsaturated product market or a niche market.

This goal shall be reached by first analysing Red Pimiento's style, repertoire and abilities, and by analysing the target group and market. Based on these results, a product category will be chosen and a design study will be carried out. This study will then be used for developing concepts. The focus of this assignment is in the concept development phase. All of this will take place within a three month time frame.



# Concept definition

- A. *Product accessory*: Bags, slip-covers, cases and other products associated with main products such as a camera or mobile phone.
- B. *B2C*: Business to consumer. Red Pimiento aims to directly deliver to consumers.
- C. *B2B*: Business to business. Currently, Red Pimiento delivers to, and commissioned by other companies.
- D. *Unsaturated market*: A product market within the consumer market with an unsaturated consumer demand, suitable for Red Pimiento to deliver a product that satisfies consumer needs.
- E. *Consumer product*: A product directly usable for consumers, without unnecessary intervention of another business.
- F. *Manufacturing*: Red Pimiento commissions products, manufactured by third-party companies.
- G. *Kitting*: Red Pimiento creates customised kits that are assembled and shipped as one unit.
- H. *Target group*: The kind of consumers Red Pimiento aims to address: functional, innovative and trendy
- I. *General production proces*: Red Pimiento's proces of: product development, commission for manufacturing and finalising into a deliverable result.

# Research Questions

The following questions are developed to grasp what knowledge is needed for achieving the final result: Reaching product proposal that meets Red Pimientos repertoire and is suitable for B2C sales and responds to an unsaturated product market or niche market.

1. What products fit Red Pimiento as a company?
  1. Red Pimiento's identity to date
  2. What products has Red Pimiento made to date?
  3. What are the characteristics of these products?
  4. How are these products developed?
  5. Summary of Identity Elements Red Pimiento B2B
  6. How does Red Pimiento view their own product line?
2. For what products on the consumer market exists an opportunity?
  1. What are emerging markets within product design?
    - a. What are emerging industries?
    - b. What products belong to these industries?
  2. What products does competition put on the market?
    - a. Who are Red Pimiento's competitors?
    - b. What products do they deliver?
3. What product is appropriate for Red Pimiento for entering the consumer market?
  1. What does literature research say on changing from B2B to B2C?
    - a. What requirements should the product meet?
    - b. What are tips and pitfalls?
  2. Which appropriate products suit Red pimiento as a company?
    - a. Which of the emerging products from question 2.1.b suit Red Pimiento?
    - b. Which of these products correspond with literature research findings?
    - c. Zijn er op basis van eventuele bevindingen andere producten die geschikt zijn?

- d. Are there, based on additional findings, other suitable products?

## Strategy & Materials

The strategy involves the approach of the assignment and how questions are answered. This approach starts with answering questions 1.1 to 3.2

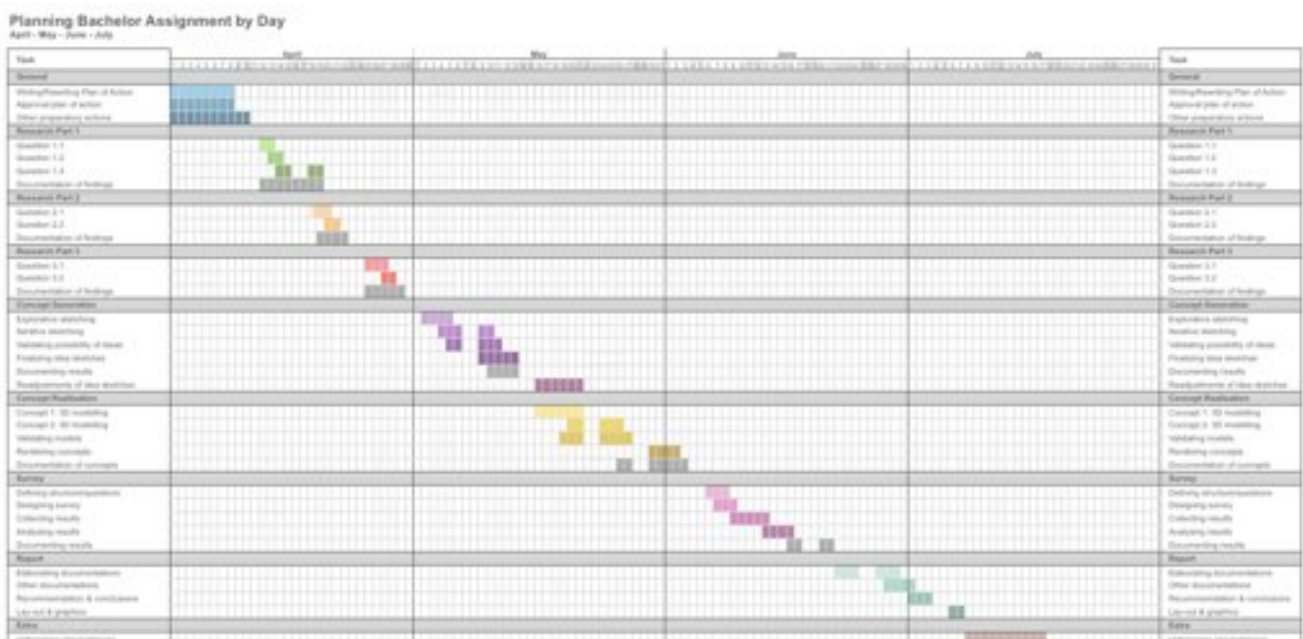
- The questions 1.1 1.2 tm will be carried out through an on-site audit. Showmodels and documents from old products may be examined . Question 1.3 will be answered by an interview with executives. During this interview findings of 1.1 and 1.2 will be reviewed.
- The questions 2.1 to 2.2 will be carried out by means of a desk research. If possible, an expert in the field of current emerging markets will be interviewed for answering question 2.2.
- The questions 3.1 to 3.2 will be carried out by means of a desk research. Findings will be communicated to Red Pimiento and feedback will be discussed.

Following this research, a choice of product category and product type will be made. Several product ideas will be developed and together with Red Pimiento, the best concepts will be elaborated upon. The level of finalisation and visualisation shall depend on the amount of chosen concepts. Should more than 3 concepts be chosen, all concepts will be elaborated upon, but only the best will be 3d modeled. Should less than 3 concepts be chosen, a more detailed technical and visual elaboration will be done.

In case when the chosen products are unsuitable for technical elaboration or for high level visual elaborations. The concepts will undergo a small (  $N \approx 30$  ) online survey instead, in which consumers will be ask to rate the concepts to determine consumer acceptance and willingness to purchase the product. The survey will be conducted with SurveyMonkey. On the basis of findings from this survey, and in consultation with Red pimienta a final concept advice will be given.

## Planning

A day-to-day planning was made starting the Bachelor Assignment. This planning, however, has been changed and edited several times throughout the internship and neither one of these plannings are not representative for the process anymore.



# ABOUT RED PIMIENTO

## What products fit Red Pimiento as a company?

For answering this main question, it is necessary to state that product-characteristics of Red Pimiento's work aren't all representative for the company style. Since RP produces products B2B, they adopt the style of these clients. Because of this, any product style-characteristics found in their repertoire, should not be directly transferred into a representation of RP. In order to make statements about suitable products for Red Pimiento, their identity and repertoire are first documented, together with their opinion on how they see their product line unfold in the future. This will result in products and product categories that fit Red Pimiento as a company.

### 1.1 Red Pimiento's identity

Red Pimiento is a fast expanding and international marketing- and industrial design agency. They are expert in added value marketing and specialised in trade marketing concepts for retail. These concepts are developed end-to-end. At this moment, their market is focused on business to business.

Most clients are brands trading in technical equipment and gadgets. Clients include:

- Heineken
- Canon
- Nikon
- Logitech
- HP
- L'Oréal Paris
- Phillips
- Samsung
- UE
- Sonos
- SennHeiser
- Microsoft

Their value adding is reached by their all-inclusive service. The need for an all-inclusive service exists because companies such as Canon used to work with several different companies to develop one product. Some companies would only deliver an idea, others would manufacture it and different companies could deliver a packaging and presentation or marketing materials. The same problem would go for designing product accessories. Red Pimiento responded to this problem by combining these steps and taking responsibility for every step of the process, and thus reducing brands planning and communication efforts and saving time.

### 1.2 What products has Red Pimiento made to date?

Red Pimiento's repertoire consists of several branded product accessories. More recent products include:

- Bags and cases, such as
  - Camera bags and cases
  - Backpacks
  - Smaller multi-functional bags
  - Bags for other digital products
- Product accessories, such as
  - Straps and clips
  - Carrying Cases
  - Bag/bike/other mounts (for attaching a camera)
  - Sleeves
  - Accessories for protection
- Marketing materials, such as
  - Packaging prints

- Packages
- P.o.s materials (banners, posters, brochures etc.)
- Images of product accessory
- Digital marketing materials

### 1.3 What are the characteristics of these products?

Since this assignment is on developing a physical product, marketing material characteristics are not included in this examination.

#### **General**

Red Pimiento's products all contain brand characteristics of the clients brand, such as colours, prints, graphics and shapes. The clients brand image can be recognised by these characteristics. For instance; designed attributes for UE are modern looking and often designed for a young and sportive public. They contain bright colours and accessories are made appropriate for outdoor use. HP can be recognised by a more technical appearance with functional graphics and accessories. All products appear high quality and some are manufactured conform regulations stated by the client to lower environmental impact. Most products have a modern look, this is due to the fact that clients often ask for accessories for new and modern products. When a product accessory has to fit a less modern target market, it is designed accordingly.

#### **Materials**

For bags, covers and cases, materials used are often synthetic fabrics like polyester. Other fabrics include leather, rubber, cotton and other polymers.

For other accessories most manufacturable materials are used; such as plastics, rubbers, woods, metal parts and other materials. Small product features such as clips and zippers are added to the design.

### 1.4 How are these products developed?

#### **Designbrief**

Products are designed in request of the client, this request does not need to be specific. Red Pimiento proposes ideas, creates concepts, orders product manufacturing and delivers presentation.

#### **Concept development**

For concept development, ideas are generated from scratch or combined with existing product on the market. Inspiration is derived from experience, creativity and current design trend. Concepts converted to modeled by the company themselves and technical specifications are added. Packaging 'kitting' can be provided, but is not always desired by the client.

#### **Production**

For production several asian manufacturers are used depending on their expertise and the design requirements. For materials choice there are material swatches available on-site.

#### **Client**

The client evaluates the result, adaptations are often made. The client only pays for the end result, all steps of the end-to-end development are included in the price. For online presentations the design development process is added to the price, since payment per quantity is not possible.

## 1.6 How does Red Pimiento view their own product line?

After having documented Red Pimiento's identity as a B2B company, the question of how they see themselves as a B2C company still remained. Therefore, a meeting with the CEO and my companies BA-mentor was arranged. The main question of this meeting was: What sorts of products does Red Pimiento see themselves launch on the consumer market?

### **Red Pimiento's idea development of B2C**

A few years ago, the idea started. The initial idea was founded on the fact that they produced all kinds of product accessories, but different clients were not always interested in a whole set of accessories. The idea was to create a line-up of accessories for the electronic market. These accessories could be designed to carry and protect electronic products such as tablets, camera's and cellphones.

But the idea was not immediately put through and lots of competition arrived. So the new idea was to invent something different. Attention turned to the extreme sports. At that moment, the extreme sports market was emerging and opportunity for suitable bags and accessories existed. For instance, GoPro camera's were emerging and needed accessories. Extreme sports would still be an interesting market, but it is no longer a very new and emerging and, again, competition arrived.

The next idea was to combine technology and accessories. For instance; gps trackers could be embedded in accessories. If you lose your wallet, or a camera with camera bag, it can be located by gps. It could be a good idea, but, there may be better ideas. Moreover, creating a cohesive line-up could prove to be difficult.

The most recent idea is a bit different, but could work well. At this moment, Red Pimiento is designing accessories for UE, a brand for fun portable outdoor speakers. The brand however, does not wish to sell a whole line-up of accessories themselves, but they would not mind if Red Pimiento does. Red Pimiento could create a line-up and sell these products in stores by using UE's brandname. All profit would go to Red Pimiento.

This most recent idea could work, but the downside to it is that Red Pimiento can not use a private brandname. And creating their own product-line with their own (new) brand is more appealing. Next to that, RP already has got these designs, so there would not be much designing left to do in this bachelor assignment. They reckon they could make use of this project more by assigning me to come up with a different idea.

### **Conclusion Red Pimiento's view on their future product line**

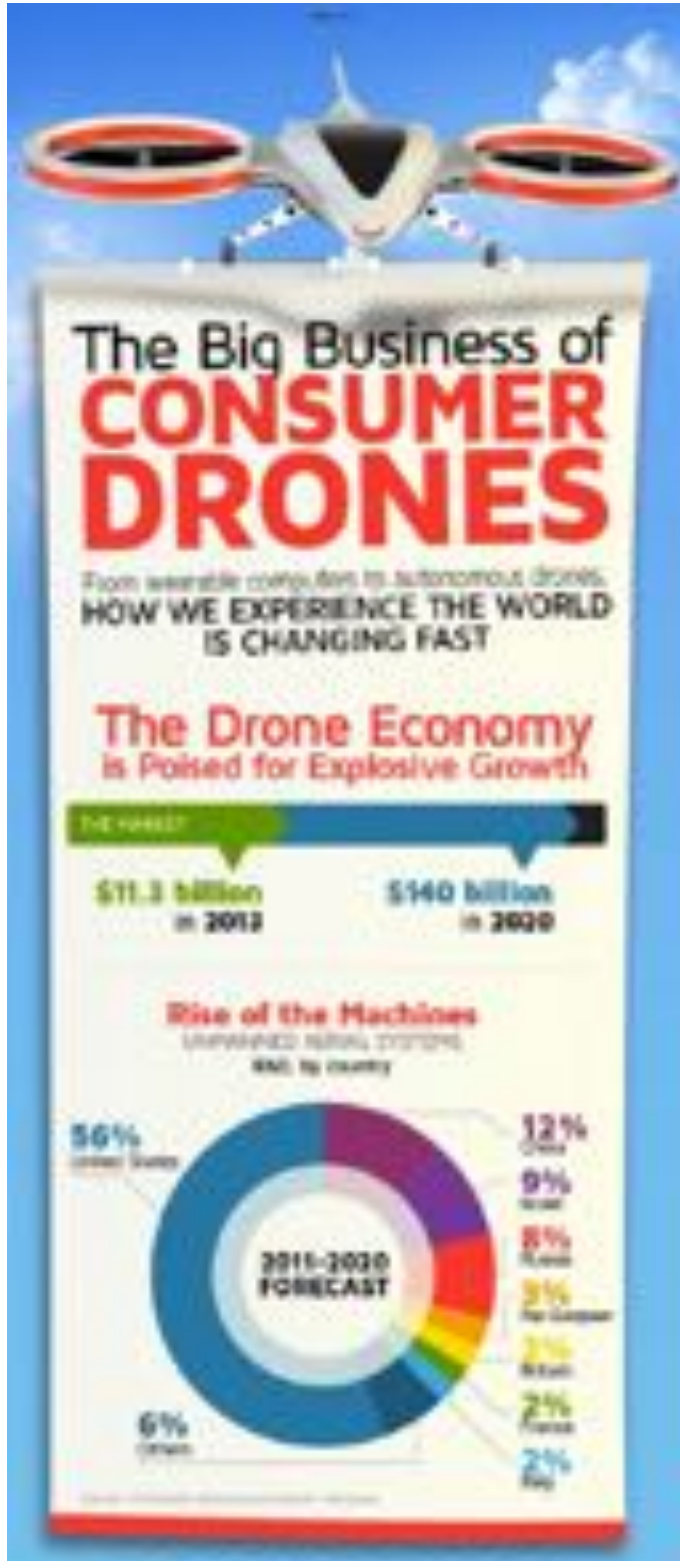
At this point, Red Pimiento is open for development in almost any direction. Thus, a new brainstorm session will take place. The goal is to come up with some product ideas ready to enter the market. This could be by thinking of a new product market, a new accessory or a new target market. For instance, maybe the gaming market could use a new accessory. Maybe there are accessories missing for women. Or maybe an existing product could be designed for children specifically, or the elderly.

## Conclusion

Product-characteristics of Red Pimiento's work are not representative for the company style, but the products are representative for their expertise. As a B2B company Red Pimiento has an essence, an identity and a value proposition, but as a B2C company this can differ. As a B2C company, Red Pimiento will become a brand with a new identity, essence and value. They will have their own brand-style, line-up, symbol and target audience. For the B2C brand, a new product market, a new accessory or a new target market could be addressed.

# DRONE INFOGRAPHIC

The Drone industry is a promising industry. The infographic<sup>1</sup> below sums up most benefits.



<sup>1</sup> J. (2014, March 25). The Big Business of Consumer Drones [Infographic]. Retrieved April 19, 2016, from <http://www.jabil.com/blog/the-big-business-of-consumer-drones-infographic.html>



# CONVERGENCE: Flying, Connected & Wearable Hobby Drones

THE DRONE MARKET IS EXPANDING INTO  
THE INTERNET OF THINGS AND WEARABLES MARKETS

*The Future is Immersive*



**Epson Moverio smart glasses**  
Smart Glass integration for commercial drone pilots provides the feeling of sitting in the cockpit.



**Epiphany Smart Glasses**  
Monitors hand motions to control drones with simple gestures.



**Thalmic Labs Myo Armband**  
The Myo gesture and muscle control armband recognizes hand gestures to control drones.



**Metalized Eyelashes**  
Blinking an eye fitted with metalized eyelashes can create a click, which could be used to power a motor in a drone.

## COMMERCIAL DRONES

Although current U.S. law requires a pilot to have FAA certificate of authorization to fly a commercial drone in U.S. civilian airspace.

Expanding Drone Certifications Will Boost  
U.S. Economic Growth

**\$40.9 million**  
revenue to U.S. manufacturing

**\$13.6 billion**  
in revenue, primarily after  
3 years from U.S. launch

**100,000**  
drones shipped into  
U.S.

**\$3 billion**  
500,000 units sold  
2015

**7,900**  
small drones will be in  
commercial use by 2020

**34,000**  
new manufacturing jobs

So the U.S. is Planning for an Inevitable Future...

## ADJACENT MARKET VALUES 2020

**\$8.9 Trillion**  
Internet of Things

**\$50 Billion**  
Wearables



**\$34 Billion**  
Big Data

**\$5.6 Billion**  
Drone payload  
(sensors, cameras, navigation)

### In the Future, Drones May...



Deliver Pizza



Fight Wildfires



Pollinate Crops



Report Breaking News



Monitor Wildlife



Replace Watchdogs

As one of the world's largest manufacturers of consumer drones, Jabil has its finger on the pulse of technology and its eye on future markets, positioning its customers to dominate the autonomous and airborne future.

**JABIL**

www.jabil.com



Twitter: @jabilcorp

## TARGET MARKETS

RED PIMIENTO

Problem:

Constantly evolving market

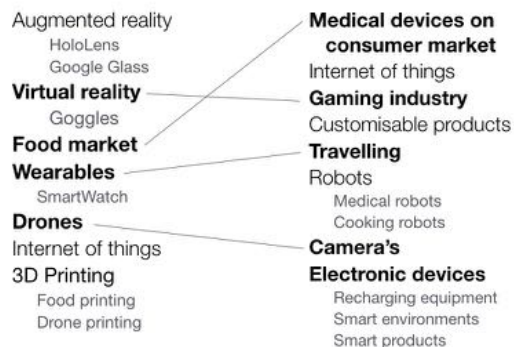


Establish a style and basis



Future ideas

## Emerging markets:



## Gaming & Virtual Reality




## Gaming & Virtual Reality

- Gaming: Already Competition
- Few accessories VR
- Future opportunities in VR
- Linked markets VR
- Already Clients in gaming market

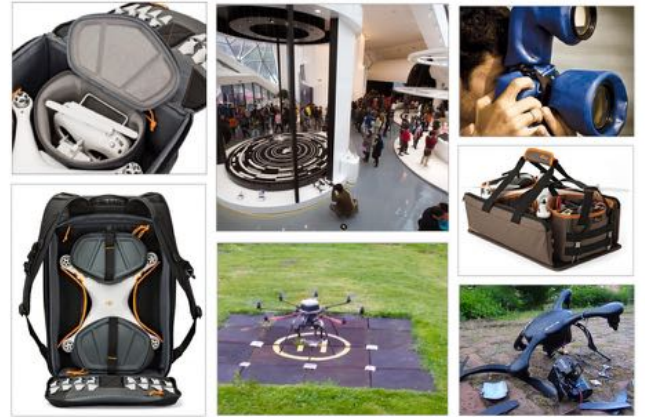




# Drones & Camera's



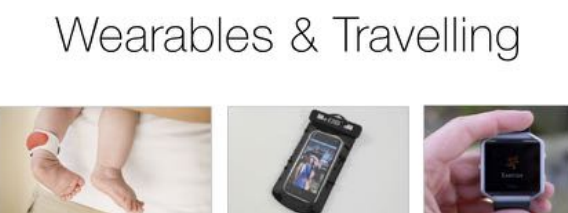
The collage consists of six images arranged in two rows. The top row features three separate images: a white quadcopter drone with red accents, a yellow quadcopter drone in flight, and a small black drone being held in a person's hand. The bottom row features two larger images: on the left, a collection of drone components including a black battery, a red battery, a black motor, and a black propeller, along with a black carrying case; on the right, a black spherical camera with the 'bubi' logo.



# Drones

- Few Competition
- Linked market opportunities
- Fast expanding
- Experience in outdoor
- Need for accessories

# Wearables & Travelling



The collage consists of six images arranged in two rows of three. The top row shows a baby's foot with a white sensor, a smartphone displaying a travel app, and a hand holding a smartwatch. The bottom row shows a stylized illustration of a smartwatch at a travel counter with items like milk and snacks, and a black travel bag with a green arrow pointing forward.



# Wearables & Traveling

- Traveling: Already Competition
- Wearables: No line-up
- Wearables: High tech
- Possibility for great gadgets
- Target group focus
- Experience Traveling

## Food & Medicine



## Food & Medicine

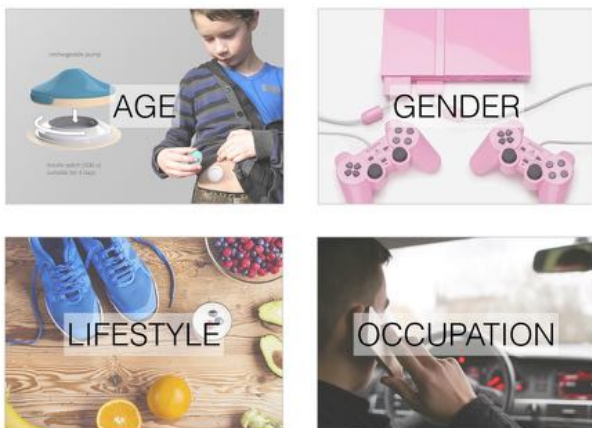
- Little experience
- Lots of regulations
- Importance
- Target group focus
- Always expanding

## Other electronic devices



## Other Electronic devices

- Small markets
- Already competition
- Few line-up opportunity
- Target group focus
- Possibility for great gadgets




## Conclusion







## E

## BRANDS &amp; ACCESSORIES






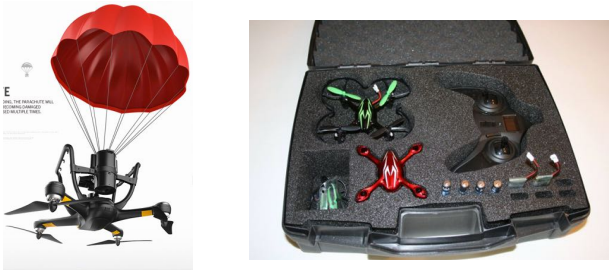




The graphic below show the most popular drone brands and their accessories























 = Brand offering any accessory

Brand	Accessories	Price	
	3 axis gimbal for GoPro	230	
	GoPro	120	
	Holder for phone/tablet	23	
	Monitor Hood	30	
	Balance weights	11	
	Fixed Go-pro mount	17	
	3DR IRIS Case	570	
	<b>Backback for solo</b>	150	
	Long leg landing gear	25	
	Display + mount	300	
	<b>Clothing</b>	20	
	Monitor Hood	16	
	Propellor Guards	20	
	<b>Remote controller strap</b>	10	
	<b>Hardshell backpack</b>	180	
	<b>Case for all phantom</b>		
	<b>Sticker set</b>	6	
	VPM's	99	
	Display + mount	incl.	
	<b>Controller strap</b>		
	All in one kit, containing:	5000	
	InspireAg Flight Craft		
	InspireAg Controller		
	Integrated Camera and 330 degree Gimbal		
	Travel Case		
	<b>Controller Holding Harness</b>		
	<b>ND Camera Filter</b>		
	<b>Tablet or Smart Phone Holder (Adjustable)</b>		



Brand	Accessories	Price	
	No accesories mini drones	80 - 400	
	HD camera in copter accessories in kits: Cellphone mount Goggles	110	
	Accessories in kits X4:  <b>Parashute in drone</b> FPV's 1080p camera 3 axis gimbal camera mount Rotor guard	400	
	Accessories in kit: Controller with build in screen <b>Backpack</b> Protection guard for transporting camera 'Steady grip' for using Gimbal camera by hand Remote controller	1000 to1800 incl 70 incl 350 220	
	Bebok drone Repairkit Storing box Backpack Mogelijkheden voor FPV Tablet/phone mount Sun protector	550 13 70 100 incl incl Incl	

Brand	Accessories	Price	
	<p>No accessories</p> <p>Build in camera and <b>leds</b> includes protective blade guards</p>	40 to 200	
	<p>Coma kit includes:</p> <p>Fixed GoPro mount Stabilised camera Backpack Case Remote controller</p>	1000	
	<p>Version containing build in wheels to either fly or drive</p> <p>No accessories</p>	30 to 120	
	<p>Carrying case</p> <p>No Accessories</p>	100 to 300	
	<p>No accessories</p>	100	

Brand	Accessories	Price	
	No accessories build in camera	60	
	Remote controller = carrying case  Blade guards	40 to 100  6	
	Versions may contain:  FPV camera in drone Monitor on remote control build in led photocamera  No accessories	50 to 120	
	3 drones  Hardshell backpack  Go pro mount  Propellor guards	300 to 1300	
	1 drone  Camera + gimbal  Bag  Case	500 to 1000    80  150	

## F

# LIST OF ACCESSORIES & DRONE PARTS

Numbers are linked to images and can be viewed below

*The green texts are accessories that are neither drone-parts nor highly technical. These accessories may be of interest to Red Pimiento.*

## Top 6 by UAV<sup>2</sup>:

1. FPV System
2. Camera
3. 3-Axis Gimbal (\$350)
4. Extra Batteries
5. Landing Pad (\$49.95)
6. Telemetry System\*

## Other accessories (no rating)

7. Backpack
8. Monitor hood
9. Carrying vest
10. GoPro Hero 4 (\$499)
11. Landing Skids (\$9)
12. DJI Phantom Props (\$7.20)

13. Prop Guards (\$5.60)
14. A Zaggometry\*\* (\$29)
15. Life Preserver from Project Ryp tide (Multiple prices on their Kickstarter page)
16. Countdown timer (\$10)
17. Panoptes eBumper (Kickstarter)
18. FPV Headset System (\$359.99)
19. Transmitter Neck Strap (\$9.99)
20. DIY Li-Po Battery Storage
21. A Weather App (free)
22. FrSky Taranis X9D Transmitter (\$315)
23. Clover Leaf Antennas (\$9.98)
24. A hat/clothing
25. HD VR Video Goggles (\$484.99)
26. Parachute
27. Lens cap
28. Balancing weights

\*Telemetry is a two-way data stream, which can both send data about the flight down to a ground station and send command up to the autopilot.<sup>3</sup>

\*\*The Zaggometry is an electronic device which can read the NAZA GPS coordinates of your copter and send it over the telemetry link down to your remote controller for display and logging.<sup>4</sup>

<sup>2</sup> Perlman, A. (2015, April 13). 35 Drone Accessories: Favorites from 33 UAV Experts. Retrieved April 22, 2016, from <http://uavcoach.com/drone-accessories/>

<sup>3</sup> Anderson, C. (2012, December 31). What exactly is meant by "telemetry" in UAV world? Retrieved April 22, 2016, from <http://diydrones.com/forum/topics/what-exactly-is-meant-by-telemetry-vs-rc-in-uav-world>

<sup>4</sup> C. (2014, August 30). Zaggometry: How to log your flights with the Taranis. Retrieved April 22, 2016, from <http://www.fpvblog.com/rctech/zaggometry-how-to-log-your-flights-with-the-taranis>





1



2



3



4



5



6



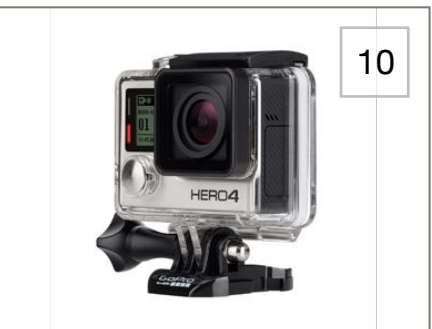
7



8



9



10



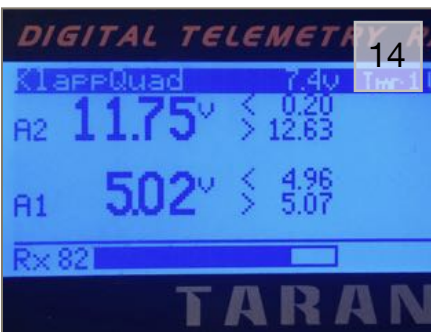
11



12



13



14



15



From the listing above can be derived that not many different non-technical accessories exist. Many 'accessories' are only available for a certain drone brand or product. These drone-dedicated accessories or parts are often offered by the drone seller. After some research, I could only find three companies in the world offering drone accessories without producing drones: NeoPine, UAV Bits and Dronesbackpack. See next pages

---

NeoPine

<http://www.hkneo.com/drone-accessories/>

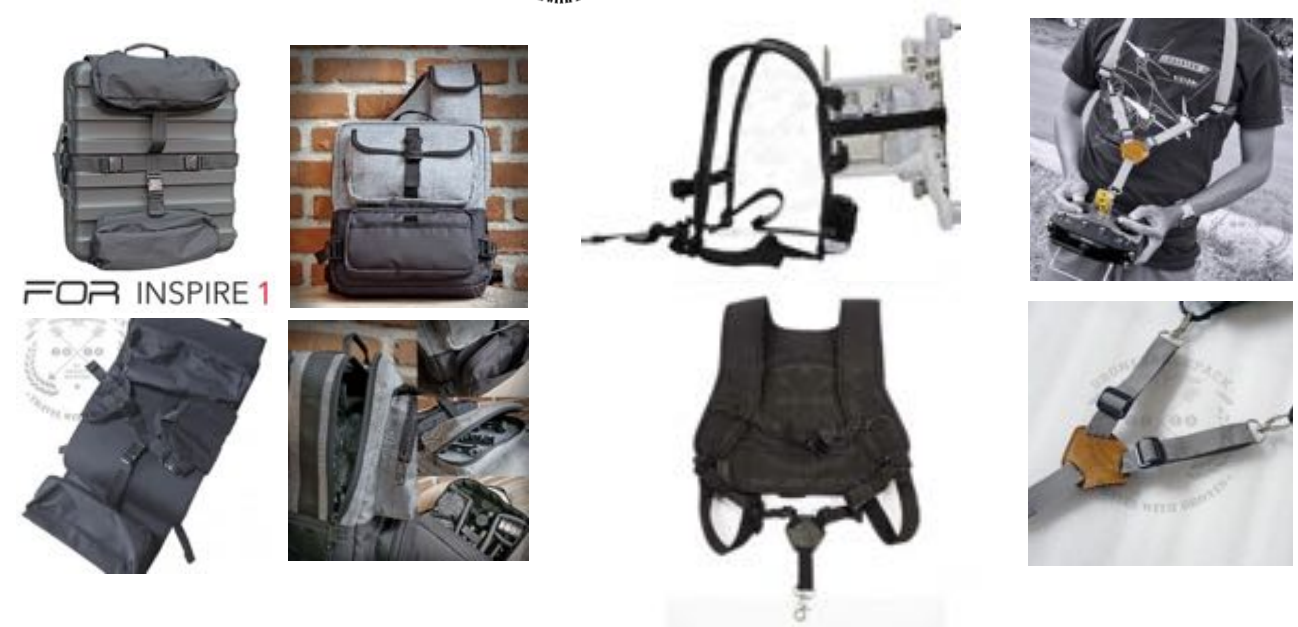
NEOPine



---

Dronesbackpack

<http://www.dronesbackpack.com/>







## WHY MFS MATTERS

Solo is built to evolve, and Made For Solo is our promise to you, the user, that the Solo you buy today will only get better — the first drone that becomes even more cool, more capable and more powerful with time. MFS allows us to work with partners worldwide to add incredible and proven new technologies to Solo that we never even imagined.

What's more, Solo will have a huge array of accessories. It marks the beginning of the "Drones &" movement: As we continue to push Solo forward as the most advanced consumer drone in the world, its open platform allows us to incorporate technologies from other exciting industries such as Virtual Reality, Imaging, Automation and Communication, offering new experiences, new business opportunities and most importantly, new ways to see and enjoy our world from above.

We want to tap your brain: Any Solo accessories you're dying to see? Please fill out our [Made For Solo Survey](#) to let us know what you're interested in!

*The accessory market seems to be expanding. This text above is from the 3DR website on their latest drone: the Solo. 3DR is actively working on designing new accessories for the drone market.*

# BRANDS OFFERING BACKPACKS & CASES



Universal



Universal



Universal

Cabinmax: <https://www.amazon.co.uk/dp/B015WIHCKK?psc=1>

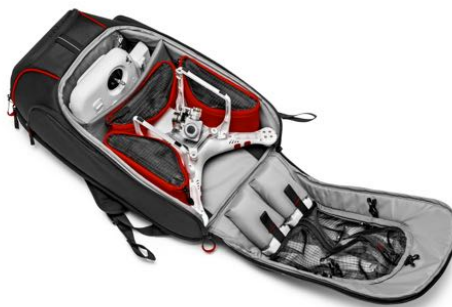
Caden: <http://www.caden-int.com/oem-bags/unmanned-aerial-vehicle-backbag-632.html>

Navitech: [https://www.amazon.co.uk/Navitech-Backpack-Quadcopters-Including-Professional/dp/B01BX0PMXU?ie=UTF8&redirect=true&ref\\_=s9\\_dcbhz\\_bw\\_g147\\_i1\\_pd](https://www.amazon.co.uk/Navitech-Backpack-Quadcopters-Including-Professional/dp/B01BX0PMXU?ie=UTF8&redirect=true&ref_=s9_dcbhz_bw_g147_i1_pd)



**Manfrotto**

<https://www.manfrotto.com/d1-backpack-for-dji-phantom>







CUSTOM BACKPACK FITS THE 3D ROBOTICS IRIS+  
\$ 169.95



CUSTOM BACKPACK FITS THE 3D ROBOTICS SOLO  
\$ 169.95



CUSTOM BACKPACK FITS THE DJI PHANTOM® 2  
VISION/VISION+  
\$ 169.95



CUSTOM CASE FITS THE DJI PHANTOM® 4 (PROPELLERS  
ON)  
\$ 199.95 \$-226.00



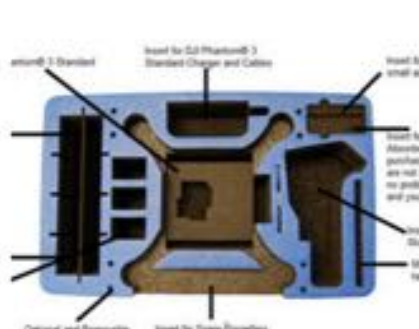
CUSTOM CASE FITS THE DJI RONIN-M  
\$ 199.95 \$-320.00



DJI INSPIRE-CARGO PACK 190 FITS THE DJI INSPIRE 1 VALUE  
ADDED FACTORY CASE AND HARD CASES OF VARIOUS SIZE  
\$ 99.95



CUSTOM BACKPACK FITS THE DJI PHANTOM® 3 ADVANCED  
OR PROFESSIONAL  
\$ 169.95



CUSTOM BACKPACK FITS THE DJI PHANTOM® 3 STANDARD  
\$ 169.95



CUSTOM BACKPACK FITS THE DJI PHANTOM® 4  
(PROPELLERS ON)  
\$ 179.95



CUSTOM CASE AND BACKPACK DESIGNED TO FIT THE DJI  
PHANTOM 4 - BUNDLE PACK  
\$ 264.95 \$-200.05



CUSTOM CASE DESIGNED TO FIT THE WALKERA SCOUT X4  
\$ 399.95 \$-440.05



CUSTOM CASE DESIGNED TO FIT THE YUNEEC  
Q500/TYPHOON  
\$ 299.95 \$-320.05

## HOBBY-ACE



Waterproof (left): [http://www.amazon.com/Hobby-Ace-Backpack-Hardshell-Waterproof-Phantom/dp/B014EQJY84/ref=sr\\_1\\_20?ie=UTF8&qid=1461845883&sr=8-20&keywords=dji+backpack](http://www.amazon.com/Hobby-Ace-Backpack-Hardshell-Waterproof-Phantom/dp/B014EQJY84/ref=sr_1_20?ie=UTF8&qid=1461845883&sr=8-20&keywords=dji+backpack)

Hardshell (right): <http://www.amazon.com/Hobby-Ace-Backpack-Hardshell-Waterproof-Phantom/dp/B014EQJY84>

## MicroRaptor

<http://microraptorcases.com/collections/all>





<http://procraftcases.com/dji-cases.html>

## LYKUS





## Koozam

<https://www.dronegeeks.com/koozam>



## RISE



## Eshine



**Lowerpro**

<http://www.lowerpro.com/>



The  
Trusted  
Original™



**OGPC**

<https://goprofessionalcases.com/>



RED PIMIENTO TO CONSUMER



## Browser

<http://www.browserbag.com/>



Universal backpack



Browser has a backpack that allows you to carrying your case inside the backpack. A case offers lots of protection but the case itself is already quite expensive and heavy.



Universal racing drone



Universal Backpack



Universal racing:

[http://www.amazon.com/Atomik-RC-Universal-Drone-Backpack/dp/B01A9PY4R0/ref=sr\\_1\\_10?ie=UTF8&qid=1461664374&sr=8-10&keywords=universal+backpack+drone](http://www.amazon.com/Atomik-RC-Universal-Drone-Backpack/dp/B01A9PY4R0/ref=sr_1_10?ie=UTF8&qid=1461664374&sr=8-10&keywords=universal+backpack+drone) \$160

Universal backpack: <http://www.swizadronebackpack.com/> \$100



# EBAY REVIEWS ON BACKPACKS

Below are reviews on some different backpacks and cases for drones, sold on eBay and Amazon. The blue texts are positive remarks, the red texts are negative remarks and the green texts are tips for improving the design. The

## Hardshell backpack (no brand)

"Instead of the cheesy rubberised drone logo on the front/center they should have the 4 corners rubberised because it scratches easy when opening it. But it is sturdy, it fits the quad and transmitter, fits up to an iPad mini, 4 props, charger harness, iPad cable & AC plug adapter, prop wrench, several SD card wallets, but **no room for anything else like paperwork, keys wallet, & cell phone** - but I am really happy with it. **Its light, compact and doesn't feel too bulky while wearing it.** The price sure beats the name brand version too - save your money for batteries and SD cards".

<http://www.ebay.com/itm/DJI-Phantom-3-Hardshell-Case-Box-Waterproof-Hard-Shoulder-Backpack-/271979869265?hash=item3f53437451:g:CMAAAOSw9N1VuJIL>



## Hardshell backpack (Lowepro)

"The dividers are not too sturdy. Found that **when the bag is stored upright the drone can slide downward causing some bending of the props.** I ended up positioning the dividers much higher and storing a ton of stuff at the bottom to help mitigate the problem.

**It should come with more storage pouches and more velcro strapping options.** The shoulder straps are not too convincing in terms of ruggedness."



"The propeller storage section is really not well thought out. **Propellers are pretty fragile, and by far the best way to carry them is to roll them up like a burrito inside something like a T-shirt.** (Propellers should never touch each other, and should be protected against nicks, scratches, etc.) Using the supplied tablet cover is just putting them in harm's way, **and is also very inconvenient for tablets**".

[http://www.amazon.com/DroneGuard-400-Lowepro-Quadcopter-Protective/dp/B014CKVZRU/ref=sr\\_1\\_3?s=photo&ie=UTF8&qid=1461661383&sr=1-3&keywords=backpack+3dr](http://www.amazon.com/DroneGuard-400-Lowepro-Quadcopter-Protective/dp/B014CKVZRU/ref=sr_1_3?s=photo&ie=UTF8&qid=1461661383&sr=1-3&keywords=backpack+3dr)



## Hardshell trolley

"I was really tempted to give this case a one star just to get people to read my review. Let's face it, most people are really only looking for the bad in something before they buy it. That said, don't mess around, get this case if you have a Phantom 3. The cut-outs fit everything perfectly. The large slot on the left, that's configurable, **fits my Samsung Galaxy Tab S 10.5" tablet that I use for the pilot app, and the props.** You could fit more in there but that's all I needed. This case has a great price and is built like a nuclear waste transport cask. I'm pretty sure you could put your copter in this case, throw it in front of a high speed train and - unfortunately - you might end up having to recalibrate your gimbal. Seriously, this is a strong case and it's lightweight.



\*\*\*\*\* A Very Important Special Note: If you are unfamiliar with the Phantom 3 battery, it is programmed to discharge automatically to below 75% if it is charged to 100% and left unused over a short period of time. DJI says it will take the battery 3 days to discharge from 100% to 75%. The reason I am mentioning this is; *the battery will get hot during that time so you don't want to have it in any case.* The way to avoid this is; if you charge your battery, *and this goes for the controller as well,* and end up not being able to use your copter for more than a few days - discharge the batteries before you store them in the case and you will be fine. They should be discharged to between 35% and 75%."

"I love that it holds my iPad mini, extra batteries, charger, spare props and the large remote. The only thing *I wish is that one or two of the cutouts were shallower and didn't run the entire depth of the case....* Makes it hard to get things like small tools and memory cards out. However, I found a *small plastic container that fits inside the cutout and stores these items well for easy removal*".

"This bad boy has gone to the beach, boat, (fell off the boat), water, rain, I sit on it and even *use it as landing platform for my Drone.* It could be robust, heavy but *it's got the wheels and holder just like any luggage.* Super happy with it and after using it for a couple of months almost daily, I believe it was the best investment I did to protect and carry my drone"

Everything fits in the provided slots like a glove except the iPad Air, but it does fit in the case well it just has extra room on the face and back side. *The iPad can be removed with out removing the phantom 3.* There are a bunch of battery slots. I only have one battery, so I use the other slots for various accessories. I wanted a case that would truly protect the p3, and would accept it *without having to remove the blades.* This case does all that and more. Truly a professional case.

<http://www.amazon.com/dp/B00XM21YC6?psc=1>

### Softshell backpack

"The *depth of the soft bag is a bit shallow* with *minimal padding.* 2 more inches would have been wiser. The top foam is loose and you must fit it before zipping the case closed. I wouldn't recommend placing anything on the front facing side when stacking as I speculate the arms of the copter can be damaged. The foam cutout is accurate and the pieces fit mostly snug"



"I had a hardcase before bought the backpack. *I like the hardcase because you can store the Phantom with props installed,* you can't do that with this backpack. *However, since the backpack is so light and versatile I haven't used the hardcase at all,* a reasonable trade-off for installing the props every flight".

[http://www.ebay.com/itm/Delux-Nylon-Case-Backpack-Bag-for-Drone-quadcopter-DJI-Phantom-3-Professional/181946493118?trksid=p2045573.c100506.m3226&trkparms=aid%3D555014%26algo%3DPL\\_DEFAULT%26ao%3D1%26asc%3D36461%26meid%3Dd95c135d60b401fa4d0d9715e992a90%26pid%3D100506%26rk%3D1%26rkt%3D1%26](http://www.ebay.com/itm/Delux-Nylon-Case-Backpack-Bag-for-Drone-quadcopter-DJI-Phantom-3-Professional/181946493118?trksid=p2045573.c100506.m3226&trkparms=aid%3D555014%26algo%3DPL_DEFAULT%26ao%3D1%26asc%3D36461%26meid%3Dd95c135d60b401fa4d0d9715e992a90%26pid%3D100506%26rk%3D1%26rkt%3D1%26)

*Very tight fit,* so adding things like LED lights and feet extenders makes it harder to put in the backpack. *I would have loved about 1/8 inch wiggle space.* I would have also liked a *recommended chart on what to put where.* Other than that, it is a good case.

I had a hard case for my Solo, but needed something more nimble for trekking through Indonesia. I researched a lot and this fit the bill! *The only thing lacking was a really good spot to keep more of my chargers,* but I somehow made it work. Must have, if you get around like I do



Great pack built by GoProffesionalCase (GPC) for 3DR. Pros - *very light, compact, quality.* Cons - *you can't carry anything else with it, no tripod, slider, dslr, nothing else will fit.* So only 3 stars. You can't even mount anything else.

### Universal softshell backpack

"This backpack is fantastic. I actually am not using it for a drone, but just school and work. The material is a nice thick material that reminds of like dark military textiles. It's literally a tech backpack. I use the remote compartment to put in a spare cables like micro usb and lightning cables. The top of the pouch is reinforced and it helps the backpack keep a structured look. I put my laptop charger and extra battery pack for my phone in that pouch. If you consider this backpack as a multifunctional tech backpack in the vein of tumi, it's an absolute bargain. The padded back and shoulders make it extremely comfortable. Here's a quick look where you can see all the pouches and just the overall quality on this thing [youtu.be/24qUYWMM4kA](https://youtu.be/24qUYWMM4kA) you can really see that care and thought was put into how this bag was made." "One great thing is that this also has a waterproof rain shield, so if there's a light sprinkle out or it's foggy/misty out, you can cover up and protect the quad from the moisture. A good thought on their part."



"The top hard case area is where I store all my spare parts and batteries. My toolbox goes into a side compartment, and the controller goes into the main compartment, along with a chair and my FPV gear. Everything fits nicely into the backpack, and is inconspicuous (onopvallend) when walking around. The build quality is good - on par with most backpacks I have used from Columbia, Jansport and so forth. Seams are tight, stitching is heavy duty."

[http://www.amazon.com/Swiza-Universal-Drone-Backpack-Black/dp/B012RZ91LY/ref=sr\\_1\\_7?ie=UTF8&qid=1461661383&sr=1-7&keywords=backpack+3dr](http://www.amazon.com/Swiza-Universal-Drone-Backpack-Black/dp/B012RZ91LY/ref=sr_1_7?ie=UTF8&qid=1461661383&sr=1-7&keywords=backpack+3dr)



### Softshell backpack (Lykus)

"Solid backpack to hold my phantom 3 standard plus all essential accessories including 4 extra batteries, charger, controller, 4 sets of propellers. Unlike other drone backpacks, this one does not have foam compartment. the way it protects your drone is that it has a square shape, EVA-made, stretchy stuff inside that can hold your drone tightly, plus the detachable belt the length of which is adjustable. All of this guarantees the drone is protected firmly.

Moreover this one feels very high end since it does not have any cheap-looking foam inside and the nylon material feels very good. The one thing that I'm not so happy with is that the manufacture should have developed at least one side pocket that can hold my water bottle as is explained by another buyer review. But overall with this decent price its a very high quality drone backpack and is recommendable."

<http://www.amazon.com/dp/B0191S8IGY?psc=1>



### Vest drone carrier (Anbee)

"This is an excellent light-weight vest for taking your phantom with only the essentials on a hike or walk. The vest/pack holds the phantom, 2 batteries (one inside the phantom), and 4 propellers. The controller clips to the holder on the chest when you are using it. I don't like to hold it there when I am walking so I use the chest strap on the vest through the metal bracket on the controller. I find it more comfortable to hold it there while hiking.

It's lightweight, nice soft neoprene material, very comfortable to wear, the controller strap hooks on with a metal ring and is VERY secure and supports the weight nicely so you can focus on flying.

FINAL THOUGHTS: The material is very nice and I love using this when I go for a hike to unleash my drone someplace unique. Its nice to just carry the essentials as opposed to a big backpack or case with every little thing".

“Unfortunately, this vest is not a viable solution to carry the drone and here is why.

1. The back of the vest is *just fabric, and flimsy*. So when you tighten the straps around the drone, it curves the shape of the vest around the drone -- and not around back of the person. This makes it not conform well to resting on your back. It rides on your back funny.

2. The vest *does not sit high enough on your back*, with the shoulder straps at smallest fitting. I'm 6 feet tall, and with the straps as small and taught as possible, I could barely get the drone to rest on my back without it drooping down.

3. There are two straps that go across the feet of the drone. One of these straps is bound to rest against the gimble. When you put the vest on with a drone, the strap near the gimble applies pressure to it, and I'm concerned it might damage the gimble. If you have the time, you could modify the strap to wrap differently, if it has enough length.

4. The front strap that goes across your chest (to prevent the vest from slipping off your shoulders, would slip apart. *The strap is too thin for the holes it weaves through in the connectors*. I managed to weave the strap together in a fashion where it would stay, but again I had to take time to modify the vest to work.

In conclusion, the vest is not worth it, unless you want to spend time modifying it to work. I've decided to use a small old backpack instead of this vest, because it's just as lightweight and it's easier than engineering this vest to work.”

[http://www.amazon.com/Anbee-Available-Quadcopter-Controller-Propellers/dp/B014XLY63S/ref=pd\\_sim\\_sbs\\_229\\_2?ie=UTF8&dplID=51PZtaf9EoL&dpSrc=sims&preST=\\_AC\\_UL160\\_SR160%2C160\\_&refRID=1MNVKRSJ1DPD1EXQ2E1X](http://www.amazon.com/Anbee-Available-Quadcopter-Controller-Propellers/dp/B014XLY63S/ref=pd_sim_sbs_229_2?ie=UTF8&dplID=51PZtaf9EoL&dpSrc=sims&preST=_AC_UL160_SR160%2C160_&refRID=1MNVKRSJ1DPD1EXQ2E1X)





# I DRONE BACKPACK MARKET

The table below shows the different backpack and cases producing brands on the market. The brands are divided in making universal and designated brands. Quality rating is derived from user reviews and overall impression. It is not based on actual product tests and could be off. It is only meant as a general indication.

UNIVERSAL	AVERAGE PRICE	HIGH QUALITY	MEDIUM QUALITY	LOW QUALITY
Manfrotto	\$200	x		
Swiza**	\$100	x		
Rise	\$150		x	
Atomic	\$160		x	
CabinMax	\$25			x
Caden	\$50			x
Navitech	\$25			x

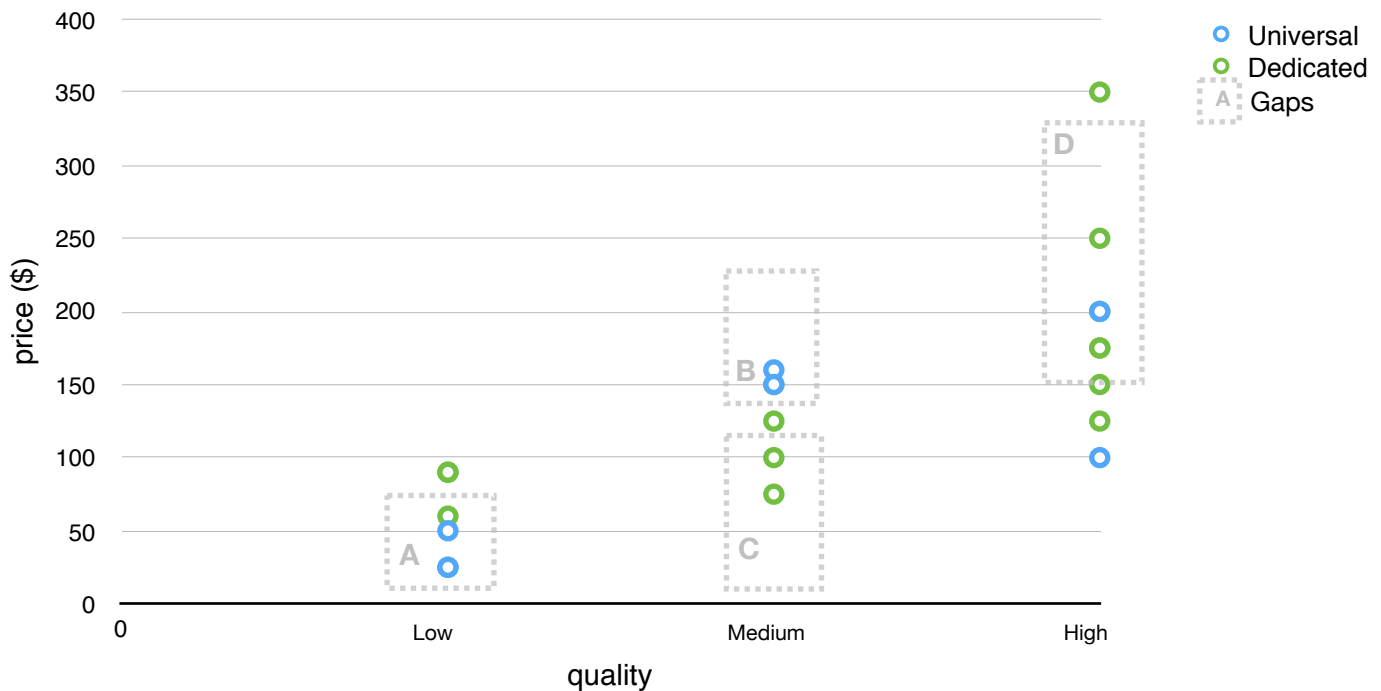
DEDICATED	AVERAGE PRICE	HIGH QUALITY	MEDIUM QUALITY	LOW QUALITY
DJI*	\$150 - \$200	x		
3DR*	\$150	x		
Browser	\$350	x		
Lowerpro	\$100 - \$ 150	x		
Microraptor	\$170	x		
OGPC	\$125 - \$250	x		
Lykus	\$100		x	
Xiro*	\$160		x	
Procraft	\$160		x	
Blade*	\$150		x	
Parrot*	\$130		x	
Hubsan*	\$80		x	
Hobby-ace	\$90			x
Eshine	\$90			x
Sunyee	\$60			x

Table ... Backpack brands and their price and quality

\*brands that also produce drones

\*\* high quality but impractical

There are less brands that produce universal backpacks than there are brands producing backpacks designated for drones. The price range for universal backpacks averages between \$25 and \$160, that of designated backpacks averages between \$60 and \$350. Prices of cases are left out of the table for four reasons: many brands offer cases, most drone producers offer a case with their drone, designs of the cases do not vary very much, and neither do the prices: the prices are consistently much higher, between \$200 and \$400. For universal backpacks, it was hard to find medium- or high-end backpacks. The list however could be lacking brands I did not find. Still, the fact that they are hard to find, does indicate it is an unsaturated market.



From the graph, four interesting gaps can be derived. It shows that [A] there are not many low quality, low priced dedicated backpacks for drones; [B] there are not many medium/high priced, medium quality dedicated backpacks; [C] not many low/medium priced, medium quality universal backpacks; and [D] not many high priced, high quality universal backpacks. In fact, there are not many high quality universal backpacks in general. Most dedicated cases however, fit in the high priced, high quality [D] region.

For drone designated backpacks there are about 5 companies producing high quality backpacks that do not produce their own drones.

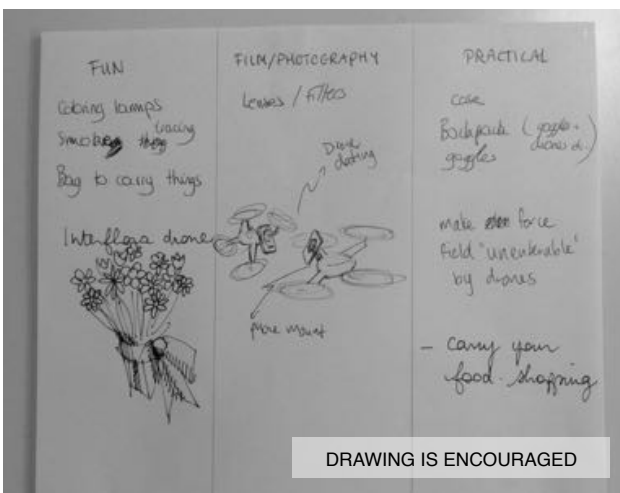
- **Microraptor** only makes drone backpacks and cases. They have 7 backpacks for different drones. Most of these backpacks consist of slight differences to suit different drones. They also have a backpack for racing drones. The larger part of their inventory consist of cases.
- **OGPC** Also only makes drone backpacks and cases. They have 9 backpacks for different drones with slight differences. It also sells drone books, locks and a ground station sun protector case. They have one universal racing drone case
- **Lowepro** makes accessories backpacks and cases for camera's, action cams, tablets and laptops. They focus mainly on sports, travel and outdoor. They have 3 very different backpacks and one backpack that fits in a case.
- **Manfrotto** mainly makes camera and lighting support accessories. They have one backpack for the DJI Phantom.
- **Browser** only makes backpacks for drones. They have 3 backpacks for DJI Inspire 1, DJI Phantom 3 and the 3DR Solo. Some of the most popular high-quality drones.

# BRAINSTORM SESSION WITH RED PIMIENTO

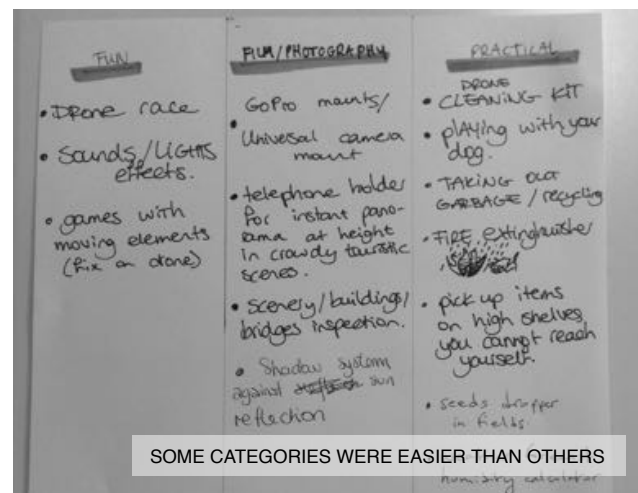
Together with 5 designers of red pimiento, a brainstorm session was carried out. Images below show the brain individual brainstorms and the collective ideas.



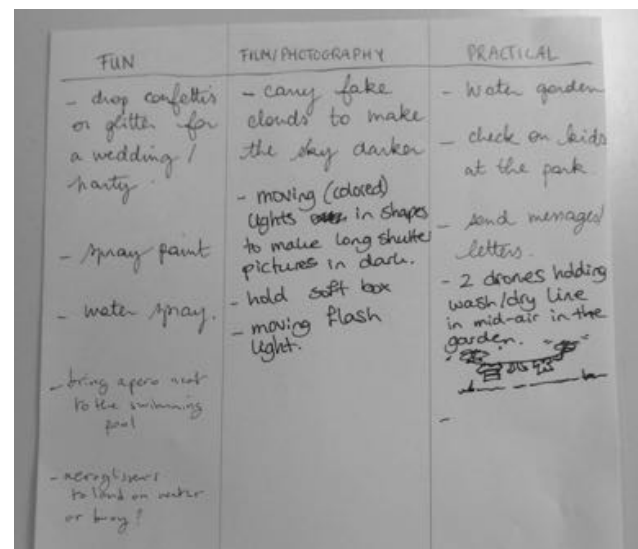
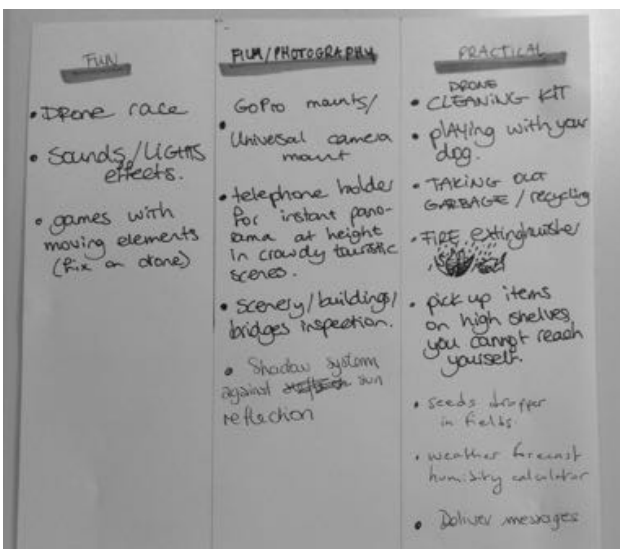
THE BRAIN WRITINGS

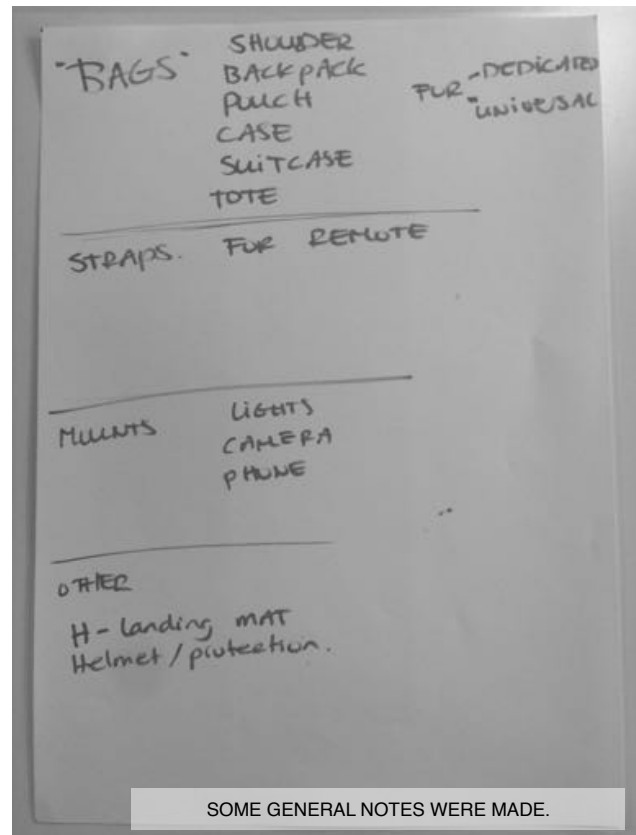
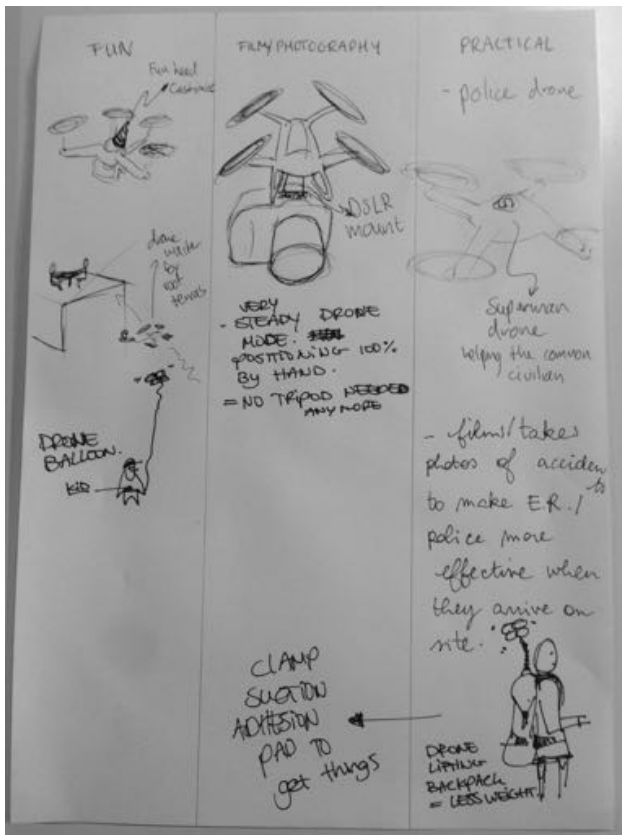


DRAWING IS ENCOURAGED

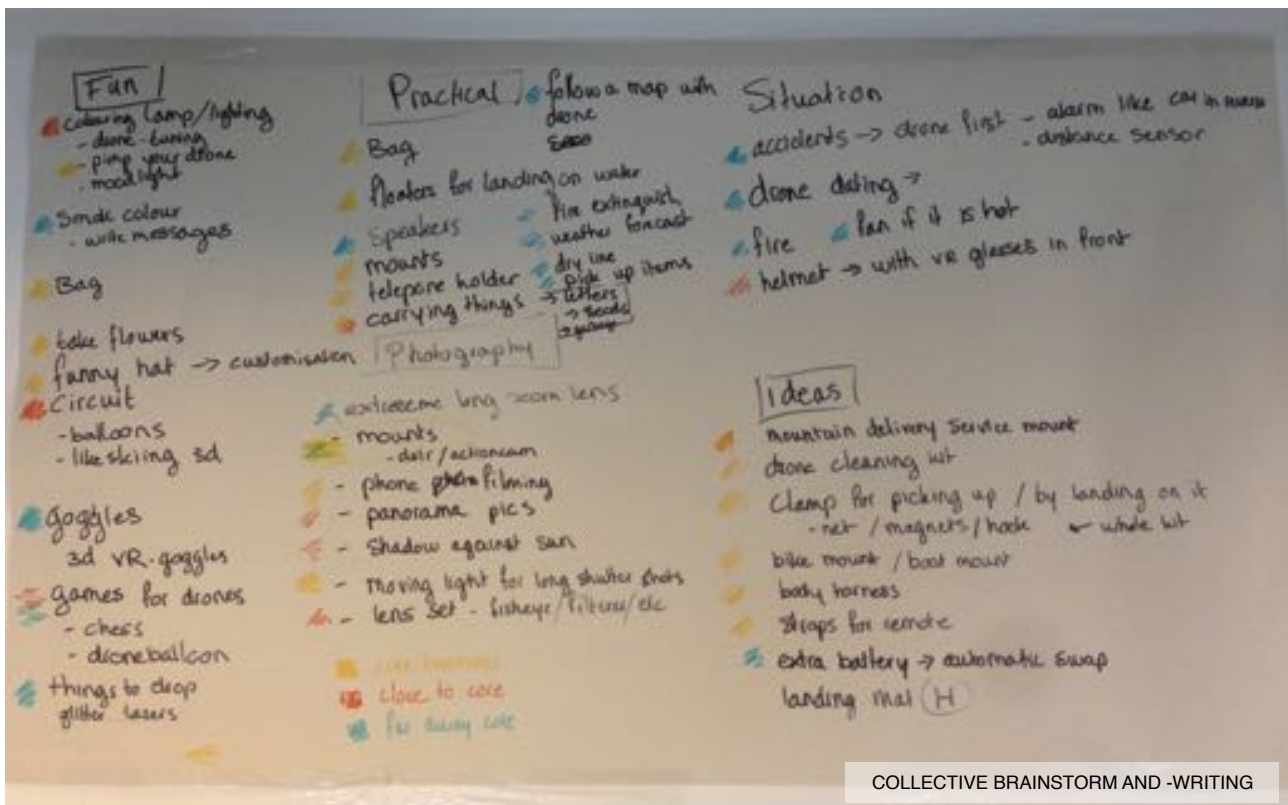


SOME CATEGORIES WERE EASIER THAN OTHERS





SOME GENERAL NOTES WERE MADE.



COLLECTIVE BRAINSTORM AND -WRITING



---

## Ideas for the FUN category

## Critical considerations:

- A 'fun' bag
  - for kids
  - including games
- Coloured lightning on the drone, such as
  - drone tuning
  - drone moodlight
- Pimp your drone: provide ways for customising the looks of your drone.
  - funny hat for your drone
- Flowerdrone: A drone that can bring you flowers
- Circuit: build your circuit for racing
  - with balloons
  - flags like skiing flags
- Games for drones
  - chess-like games
  - balloons to attach to your drone

*Mini drones are more appropriate drones for kids. For mini drones, a fun shaped and coloured bag could be designed.*

*Most popular drones already do have built in lights, but for the ones that don't this can be a great fun feature. It is quite technical though, so not too close to Red Pimiento's core business.*

*Moodlights are nice on a drone if it would fly very high in the air. Otherwise, the noise a drone makes would probably ruin the intended mood. On top of that; flying time is a bit too short for such a feature (+/- 15 min)*

*Customising your drone is great, since there are not many different designs on the market yet. Girls can make it girly, dads can make it cheesy and tech-lovers can leave it just the way it looks. The only things that should be taken into consideration is that the material should not inhibit a safe flight and should not add too much weight.*

*Racing drones are a bit of a separate growing business. It is a quite serious business with lots of techs, but the idea of racing each other does not have to be.*

*Providing accessories for small races at home could be fun, but, these races should only be done with smaller cheaper drones for safety and costs reasons.*

*Racing circuit is already a 'game for drones' other games could be something with laser pointers, balloons, or something like a 'Mario minigame'.*

---

## The Practical category

## Critical considerations:

- A practical bag
  - including practical features
  - for more than only carrying drone
- Floaters for landing on water
- Mounts
  - for bicycle

*Making a bag more practical sounds like a great idea. And can be reached in many ways. An all-in-one bag could be the solution, or a modular bag that you can adjust to your own needs. Maybe the bag can be made easier to travel with, more protective or with more storing space*

*Though most drones are not waterproof, landing or taking off from a water surface could be needed. It could also be for drone-safety reasons. If someone should want to fly a drone above sea, but the drone crashes, with floaters it does not sink to the bottom.*

- Telephone holder: attaching your telephone to your drone

*At first, a telephone holder sounded like a great idea, but it has some detriments: First off a telephone is heavy. Bigger drones already have camera's, smaller drones can't carry them. Second; if you could manage to attach a camera to a drone, it can only take a picture if you click the button on your phone. Next t that, you won't be able to see what your phone is filming and if the drone crashes; so does your phone. But, with the right protection and technology, it might be made to work.*

- Carrying things
  - basket
  - ams for grabbing objects

*A drone can reach hights and places person might not be able to reach. Or at least not that easily. If you want to drop something off at such a place, why not use your fast manoeuvrable drone? The downside to this idea is; there are no ways yet for manually control grabbing arms for drones. Which is too technical for Red Pimiento to fit their core business. But baskets and hooks and such might just as well do the trick.*

---

## The Photo/Filming category

### Critical considerations

- Mounts
  - for DSLR or actioncamera
  - cellphone
- Panorama pictures: A way to make panorama's
- A hood to protect against sun
- Lights on drone for long shutter shots: by increasing shutter time, lights can be used to make drawings in the sky
- A lens set
  - fisheye, filters and other lenses

*Drone brands capable of carrying DSLR's or Actioncameras already provide them. Maybe these mounts could be improved, but that is far from Red Pimiento's core business.*

*If making panorama's is desired the camera should offer this feature.*

*Most hoods already exist.*

*Lights for long shutter shots are a good idea. A simple light attachable to the drone would already suffice.*

*Lens sets could be bundled in corporation with brands making the lenses. For bundeling a small case can be designed.*

---

## Other ideas

*Other (practical) ideas we came up with*

- Mountain delivery service mount
- Drone cleaning kit

---

## Critical considerations

*The idea for the ' mountain delivery service was that if two people want to deliver something between, say, two mountains. A drone may come in handy. Other situations could be: high buildings, waters, crowded places (laws).*

*Drone cleaning kit, simple and convenient. Could be combined with a repair kit.*

- A kit for picking up different objects

*A kit for picking up objects is a nice variation to manually controllable arms. This kit could include: Velcro (Klitteband), magnets, hooks and nets.*

- Body harness for drone

*Body harness for drone is very drone model specific and not ideal for large scale, but the idea of extra protection is a good one.*

- Strap for remote controller

*The strap exists but could be improved.*

- Landing mat for landing your drone or for taking off

*Landing mat is a nice idea too. Whether it should be soft or hard material can be examined.*

# A mindmap of the ideas

For making the brainstorm more apparent, I put the ideas in a mind map:





And I encircled the subjects I would like to look into more:



As you can see, most subjects are interesting enough to look into. For gaming, existing board- and computergames, laserpoint games and amateur drone racing can be explored. Ways for carrying things have also been coming up a lot too.

## K

## FIELD RESEARCH

This appendix shows the visits to Media Markt; the most common points of sale for standard consumer flying drones. And to DroneLand; a company selling drones and providing flying lessons for them.

## MEDIAMARKT



Mediamarkt had about 20 different drones presented in store. Online they offer 32 different drones, of which 20 are for filming. Behind the drones, parts and extra components are displayed. These parts include: extra propellers, landing gear, batteries, cables and motors. The parts looked quite technical and not particularly user-friendly for the 'everyday consumer'.





The most obvious drone presented was the DJI phantom. It was displayed in the middle of the path and, according to the salesman, it is the most sold drone. Remarks on the drone: It is much lighter than I expected (both controller and drone), the gimbal + camera can not be removed, removing the propellers on the phantom 4 is very easy and quickly done. The drone is fairly small, convenient for traveling. The aisle adjacent to the drone aisle contained cameras. And the wall between them was completely filled with SD cards.



SD-cards



Sensitive materials





*Detach here*



*batter does not come off*



*Explanation for buttons?*



The phone mount can be taken off but you need the right tool for it. The battery simply slides in. All parts are sturdy. Most buttons on the controller speak for themselves but some functions were not clear to me. Though a guide might explain this, [beginners may benefit from extra explanation](#). The also sold two kinds of bags, a hardshell and a softshell backpack, of which the hardshell could take a look into.







*Easily  
removable  
insert*



*Everything  
stitched  
together*

Without a drone, the backpack lies comfortable in the back due to the pads. The backpack looks cheap, mostly because of the foam insert (it costs 180 euro's). The insert can come out which may be convenient for replacement but is not necessary. It prompts the idea that it will eventually need replacement, which is not a positive thought. Moreover, I am a bit worried it will come out and rumble in my backpack. It is not a pretty backpack and I would have liked some extra protection to cover the zipper; I do not want raindrops to drip through the zip line.

# DRONELAND



DroneLand has about 15 different drones presented in store. On the left side of the picture, consumer drones are presented, on the right side the more high-end commercial drones. For consumer drones, they sell the brands: DJI, Yuneec and Walkera (racingdrone). Next to drones, they have cases and two drone-bags, for the racing drones they also sell a few parts. In the back, they have a workplace for repairing broken drones.



FOUR OLDER DJI PHANTOM VERSIONS



DJI PHANTOM 4



WALKERA RACING DRONES



YUNEEC TYPHOON

I got a guided tour and managed to get a demonstration of the DJI Phantom 4 (indoor). For every drone he told a bit about the perks, like: Flying time, the accompanying cameras, how they are set up and used. The gifs below show shots of the demonstration.





A VIDEO

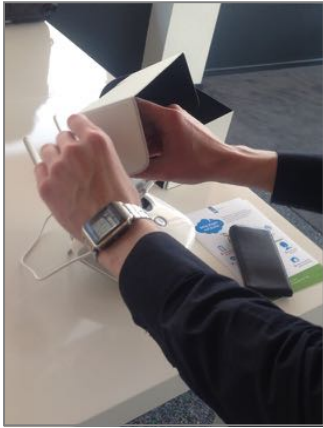


A VIDEO



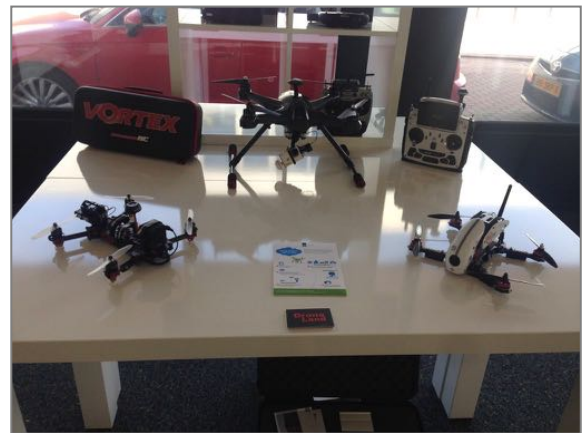
A VIDEO

The Phantom 4 (the drone starring in the gifs) is very easy to fly. It stabilises itself, its sensors prevent it from flying into the wall or other objects within a 2 meter reach. When doing nothing on the controller, it will fly still in the air and the controls are said to be easy to learn. For landing, a flat surface is convenient. The hood below provides shadow for reading your cellphone in the sun. All hood protectors are white or black.

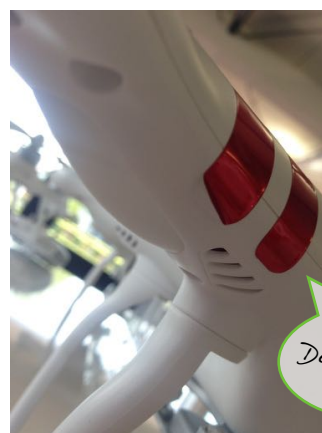




Droneland had a controller cover accessory in different colours. The accessory fixes a problem I addressed before: The different control-functions are not always very clear. This rubber cover has texts imprints to explain the use of every switch and button. DroneLand does not make them themselves but buys them online. AliExpress sells them for \$9,90 (<http://www.aliexpress.com/item/DJI-Phantom-3-Inspire-1-Remote-Controller-Silicone-Protective-Cover-Version/32461884220.html>). Maybe such a cover could be matched with a drone cover.



For racing drones they provided a cover that fits the walkera. The tour guide had told me he has a racing drone and races it as a hobbyist. He thinks covers like the one in the picture are redundant, since racing drones are made to survive a crash. He 'just throws his drone in the back of his car'.



DJI Phantom (standard) has a bit of their own customisation. It is not supposed to be removed, but may be covered by other stickers. Interestingly, although the touring guide did not consider customisation interestingly enough, they did custom spray-paint a Parrot drone so it would match the company's colours. He was proud to tell that it was the only known red Parrot drone in the whole world (photo unavailable).

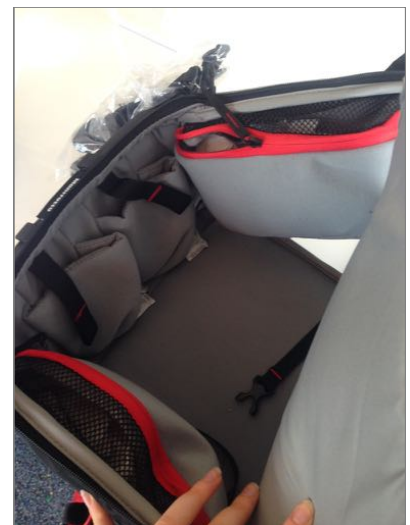




many clips  
covering zipper



Room for drone

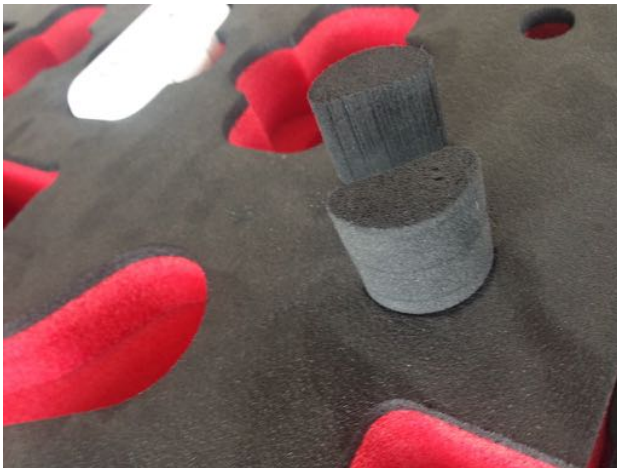


Room for  
camera



The DJI backpack sold by DroneLand is designed by Manfrotto. General impression: Looks high-end and well designed. The older DJI phantoms fit in the backpack plus extra space for a DSLR. According to the touring guide it has too much unnecessary clips and takes too long: to put the drone in there you have to unclip 6 (useless) clips and unzip 90% of the bag.





Different layers  
 saves space but takes  
 more time

Different cases fit different drones. All cases appeared to be high quality. According to the touring guide, the cases are ideal for traveling by plane, but not very necessary for short trips. They are convenient for storing your drone, but are expensive. They do provide maximum protection. All cases have wheels and a trolley handle.



As mentioned in one of the reviews of drone backpacks: The batteries can get hot. On the counter of DroneLand a very eye-catching flyer warns for the danger of overheated battery when they are stored in your carrier. A pouch can offer protection against fire.

# USER SCENARIO'S & USER INFORMATION

The scenarios below are composed based on interviews, online blogs, vlogs and video's. I wrote them to give an idea how drones are used and to illustrate basic steps and scenarios that may be overlooked.

## **The crash**

Boris is walking through the main entrance of DroneLand. During his break he was hoping to drop off his drone for repair. Normally he just carries his drone by hand and puts it in his car unprotected, but for this situation he had to improvise a box. With the box in his hands he uncomfortably walks to the cashier. She already read the look on his face: Total loss. It all happened when he was helping his parents fixing their roof, he told her with a remorseful undertone. He was supposed to check the straw roofing on the east-side of the house. Standing on the west-side, he could only navigate through the vision of the drone camera, displayed on his phone. That's where it all went terribly wrong. Not being able to see both frontward and downwards, he miscalculated the distance and descended too soon. His landing gear hit the edge of the rooftop, resulting in an impressive plunge, a damaged landing gear, 4 broken propellers and a cracked lens. Luckily, the roof looked flawless and the cashier of DroneLand assured him that the drone would be in mint condition by the end of the week.

## **On the beach**

Blane often goes to the beach with his friends. They usually go surfing and Blane likes to make video's of it for his blog. As they pack their car for the trip, Blade makes sure his drone and camera bag isn't crushed by all the surfing equipment. He also brings a spare garbage bag, to protect his equipment from his friends soaking wetsuits on the way back. Once there, they all walk to a quiet spot on the beach and Blade puts his drone on the ground, in the sand. Setting up his drone is a bit of a trick: He has to attach the propellers and calibrate the camera, but he does not want get sand on his controller and other equipment. With his knees in the hot sand he managed to prepare everything for takeoff. But taking off from this hot and dusty sand was not his best idea. Starting the propellers, sand is blown everywhere. Though it caused no immediate damage, the lens is now filthy and there may be small dust in the system. Next time, he would find a better spot to launch his drone.

## **Step-by-step**

John is shooting footage for a wedding for the first time. To prepare for the day, he packs his car with all necessities. He will need his case with drone, his tablet for flying with it, his papers, his camera bag with extra lenses, his tripod, a laptop, charger and extension cord, a cheesy wedding gift, a timer (for tracking the flight time of his drone) and a battery charger. He also brought something for executing this new idea he got for shooting unique footage: once outdoor, he wants to fly above the married couple and release confetti from his selfmade a bag. It should be great. The filming at the wedding went great, apart from one slight problem: the only audio he recorded sounded like a swarm of bees on tuned engines. Not so useful. Next time, he will bring a separate microphone for recording sound.



# USER INFORMATION

This paragraph includes a brief explanation on the main users and sub-users of the consumer drone users.

## Main users

The main group of users for consumer drones are aged between 14 - 60, they are either tech-lovers or photographer/filmmakers or both. Most likely due to the relatively high level of technology, most users are male, however, more female users are starting to take part. For drones in higher price ranges (600-3000 euros), more serious hobbyists, one-man businesses and small companies make up the market, ages are usually between 18 and 40, but may deviate. Lower price range markets (10-300 euros) are made up less serious hobbyist and include about all rational ages.

## Females

The drone business closely mirrors the tech world in many ways, including the scarcity of women. When searching for feminine looking drones or accessories, not much result shows up. And while no group tracks the gender breakdown of the industry, Fortune magazine states that a glance at the executive teams of the top companies tells a pretty clear story: All six top execs at 3D Robotics and Vires Aeronautics are men, while Skycatch and PrecisionHawk each have one woman on their executive teams<sup>5</sup>. Having asked around about drones myself, I have to admit I have only spoken to men. Still, the industry does have its female power players, and even female drone websites<sup>6,7</sup>, webpages<sup>8</sup> and events<sup>9</sup>.

## Researchers

Drones are increasingly used for performing research, but research is also increasingly done on drones. Often times this is done by universities and their students and accompanying researchers.

The FAA this week announced that in the very near future, it will start allowing students to operate UAS for educational and research purposes.

“As a result, schools and students will no longer need a Section 333 exemption or any other authorization to fly provided they follow the rules for model aircraft,” according to an FAA statement. “Faculty will be able to use drones in connection with helping their students with their courses”<sup>10</sup>.

## Children

Red Pimiento asked me to state exactly how large the share of children users is. This information appeared almost impossible to find. No research can be found on this matter, and websites do not state how much is sold to whom, neither do they reply to emails on this subject. Thus, for getting a modest indication, I took a different road. For making an educated guess, and not

---

<sup>5</sup> McCue, M. (2015, July 1). Meet the women shaping the future of the drone business. Retrieved May 13, 2016, from <http://fortune.com/2015/07/01/women-drone-industry/>

<sup>6</sup> <https://thedronegirl.com/about/>

<sup>7</sup> <http://ameliadronehart.com/>

<sup>8</sup> <http://dartdrones.com/happy-mothers-day-meet-the-moms-of-dartdrones/>

<sup>9</sup> <http://droneblog.com/2016/05/12/second-women-in-drones-event-planned-for-interdrone/>

<sup>10</sup> Shaban, H. (2016, May 4). Students Can Now Fly Drones At School, FAA Says. Retrieved May 13, 2016, from [https://www.buzzfeed.com/hamzashaban/students-can-now-fly-drones-at-school-faa-says?utm\\_term=.qwbZ5mZDqM#.hspNJ7N3q2](https://www.buzzfeed.com/hamzashaban/students-can-now-fly-drones-at-school-faa-says?utm_term=.qwbZ5mZDqM#.hspNJ7N3q2)

spending too much time on this, I took a look at of the amount of child-friendly drones 'on the market'. For this I looked at drones sold on Amazon. When entering 'drone' in the search bar, 43.901 results are found in the 'Toys and Games' category and 13.189 results are found in the 'electronics' category. The Toys and Games category can be filtered on age:

#### Toys Age Range

- ☐ Birth to 24 Months (2,139)
- ☐ 2 to 4 Years (3,099)
- ☐ 5 to 7 Years (2,118)
- ☐ 8 to 13 Years (6,571)
- ☐ 14 Years & Up (25,098)

The categorisation is not too reliable, considering babies to 24 months probably should not play with a drone. But, there are certainly drones (such as mini drones or driving drones) appropriate for children. The quantities should not be seen as the amount of different drones. Many of the same drones are presented lots of times in the same category, and drone accessories are not completely filtered out. The 13.189 drones from the Electronics category can not be filtered on age; these drones are mostly the more expensive ones appropriate for filming and such.

So, as a conclusion; there is a market for drones as toys. However, the relatively low price range of drones as toys should be considered:

#### Price

Under \$25 (18,560)

\$25 to \$50 (9,240)

\$50 to \$100 (8,381)

\$100 to \$200 (4,847)

\$200 & Above (3,023)

\$  to \$

By far the most toy drones are less than \$100, and the more expensive ones should perhaps not be considered toys anymore. The reason I am mentioning this price range is the fact that it influences the accepted price range of accessories. And unless the accessory is very cheap - it may negatively influence overall willingness to buy 'something extra'.

some toys do not look very child-friendly



Which may be something to improve them on. I could not find bags or sleeves for these toy-drones, which may also be an interesting product to develop.

# DRONE USES

## Filming

A very common way for using drones is filming

<http://diydrone.com/profiles/blogs/how-to-choose-your-first-quadcopter>

If you want to buy a drone for filming, there are two options: some drones come with a camera (either build in or in a kit), and some come without. If you already have a GoPro or Gimbal, the all-in-one drone is unnecessary. If you do not, it is important to check what type of camera is on it. And what equipment you already own? Lots of video's exist for choosing the right drone.



At this moment 3DR and DJI drones are most popular and can be set up with a GoPro or Gimbal and goggles with FPV system (first person view). Lots of other brands offer the same opportunity.

There are many drones that have a build in camera that work perfectly well. If you buy a drone that comes with equipment to manually attach a camera, you only need smartphone or tablet to view video. Downside of this is that the camera is often fragile. If you go out and fly with no experience it is not recommended to buy a 1200 dollar quadcopter. It has very precise motor bearings lightweight materials that don't survive a crash very well. The copter itself is strong enough and propellers can be changed.

## Hollywood

Apparently the Hollywood movie industry is making use of drones for filming movie shots. Marvel's movie Avengers: Age of Ultron is a good example of this.



## Kickstarter

Many kickstarter projects try to get their drone on the market. Some of these projects contain smarter technologies, some are water- or dust proof and some are made for a different use. This project, for instance, allows you to put your phone in a drone.

[https://www.kickstarter.com/projects/137596013/phonedrone-ethos-a-whole-new-dimension-for-your-sm?ref=nav\\_search](https://www.kickstarter.com/projects/137596013/phonedrone-ethos-a-whole-new-dimension-for-your-sm?ref=nav_search)



The benefit of this drone is that it is much cheaper since its technology is already in your phone. The downside is that in order to control it you will need another phone, and if the drone crashes, so will your phone.



When **not** to use a drone for filming<sup>11</sup>

According to the photography website EnvatoTuts+, there are cases where a drone might not be the best choice for a filming project. Weddings are their first example. “Drones may be great for getting aerial pictures of the location or of the bride and groom before the service, but I would never recommend to use one during a service (unlike one of the DJI promotion videos shows). The fact is that they are just **too loud and distracting** for a scenario like that”.

Anything with dialog will pose problems, because all you will hear is the humming from the drone. **Some drones don't even record audio because of this.** But that is something that is pretty obvious and I would think that most people would expect to be recording the audio separate anyway or, if there is dialog, doing audio dubbing after the fact.

A drone will also obviously put out a fair amount of **wind**, nearly all of it directly below. Normally this shouldn't pose much of a problem, but if you are trying to capture shots directly overhead of someone (which really isn't recommended for safety reasons) know that a lot of wind will be pushing down on your subject. Drones will also **scare away animals and stir up dust**.

## Video Racing

First-person video drone racing is exploding in popularity, thanks to a couple technical advances and some amazing YouTube videos.

<https://www.youtube.com/watch?v=pZ0viMxYDA4>

March 21: The World Drone Prix in Dubai was the first million dollar drone race, with the winning team taking home a cool \$250,000. It is the largest drone race existing. 32 teams joined from every corner of the world, not just for the prize money, but also for the track:



Part of the goal of this project is to push people to invent better, faster and more durable drones. The drones entering this competition are not commercial drones but much smaller, lighter, self-build drones, that can fly up to 160 miles/h.

---

<sup>11</sup> Yeager, C. (2015, June 19). How to Choose a Camera Drone for Aerial Photography. Retrieved April 25, 2016, from <http://photography.tutsplus.com/tutorials/how-to-choose-a-camera-drone-for-aerial-photography--cms-24225>



Of course, less professional races take place too. With mini-drones, anyone can race for fun in their own indoor or outdoor environment.



The drones crashed a lot of times, but did not break. Only the propellers had to be replaced.

# Social sharing

Drones are used for social sharing networks. Websites like <http://www.dronestagr.am/> are emerging, where drone-taken photo's and video's can be shared. Some drones are even designed for social purposes

## Orbit

This kickstarter project helps making videoblogs:

<https://www.kickstarter.com/projects/skyeintel/orbit-the-social-sharing-drone-with-precise-autof?ref=discovery>



“Orbit is the world’s first social sharing, autonomous drone that follows you on demand. Videos can be easily edited and shared via App.”

## Skycall

SkyCall is an intuitive system designed by MIT students to help people navigate the confusing pathways of MIT campus. Connected to a smartphone app, these unmanned drones will guide



you to your destination on campus. This is only the first stage in an ongoing project, which will eventually provide “novel, positive uses of UAV technology in the urban context”<sup>12</sup>.

## Facebook

Facebook is launching ‘Aquila’ a solar-powered drone that will provide internet to billions via laser communications. Aquila will be able to fly for three months at a time without landing and will use a laser to transport data to the base station on the ground. Facebook’s goal is to work with local ISP’s to deliver internet to large rural areas<sup>13</sup>.

## Journalism

Drone Journalism has been around for a while. In fact, there is a whole organisation dedicated to it. It’s never been picked up by mainstream media until now. A new initiative by the New York Times, the Washington post and 8 other prominent publications will experiment with the use of small UAVs for newsgathering. The advantages of drones as newsgathering tools in certain situations, because they provide journalists with a safe way to gather important footage and information or give them incognito access to normally inaccessible areas<sup>14</sup>.

# Government

The government can benefit in different ways from using drones. For instance for using drones to detect fires, follow criminals on the run, or monitor crops, wildlife and nature.

## Fire detecting

Drones can spot a forest fire before it’s grown into a size that’s hard to put out. NASA has created a system with two drones and infra-red camera’s, that should make spotting wild fires in their early stages much easier. The advantage of drones is that they can fly at lower altitudes and at much slower speeds, allowing them to get a clear image of fire-prone areas<sup>15</sup>.

## Police chase by drone

In North Dakota, four policemen managed to catch four underage people who were pulled over for drunk driving and then made their way into a corn field<sup>16</sup>. Considering the event happened during the night. Finding them on foot would have been almost impossible. But, the cops has a drone at their disposal, which they used in order to catch the cornfield runners in a matter of minutes. While this isn’t a precedent in chasing down criminals using drones, it’s nice to see them being utilised in the USA, considering it’s the biggest drone market in the world right now.

---

<sup>12</sup> How can we reimagine UAV technology... (n.d.). Retrieved April 25, 2016, from <http://senseable.mit.edu/skycall/>

<sup>13</sup> Nelly, B. (2015, October 30). 7 Leading Brands Pioneering Drones as a Service - Social Media Week. Retrieved April 25, 2016, from <http://socialmediaweek.org/blog/2015/10/drones-utilized-leading-tech-influencers/>

<sup>14</sup> Clarke, C. (2015, January 25). New York Times and others to trial the use of drones for newsgathering. Retrieved April 25, 2016, from <http://www.thedrum.com/news/2015/01/17/new-york-times-and-others-trial-use-drones-newsgathering>

<sup>15</sup> N. (2014, October 15). NASA tests fire spotting drone (test preps). Retrieved April 25, 2016, from <https://www.youtube.com/watch?v=wmWEpFFbb0M>

<sup>16</sup> AeroVironment Inc. (2011, November 03). Qube™ Public Safety UAS. Retrieved April 25, 2016, from <https://www.youtube.com/watch?v=ZzHx7AxHmOA>

# DRONE SPECIFICATIONS

## General

Most drones share the following hardware:

- (1) Propellers, usually 4, 6 or 8, or any even number. Generally, the higher the number of propellers, the greater the payload the drone can carry
- (2) Electronic speed controllers, which can change the speed of rotation of each of the propeller motors, enabling it to ascend, descend or move forward
- (3) GPS and compass, are used to calculate the drone's position and altitude. Most consumer drones have a "return home" function
- (4) Battery, crucial as an energy source but is also a source of weight, reducing the payload
- (5) Gimbal, a support that enables the rotation of an object (usually a camera) around an axis
- (6) Optional video, many drones include a mount and circuitry for controlling a camera and capturing and transmitting high-definition video.

## Battery:

Flight time per battery: roughly **10 to 15 minutes** (for DJI and 3DR)<sup>17</sup>.

*"Both drones claim much more time on their specs, from 20 to 23 minutes, however that is if you drain the battery completely and that isn't recommended for most flights. It is common practice to begin to land the drone with about 35% battery left to prolong the life of the batteries and to have some flight-time left in case something happens to go wrong and you can't land immediately".*

Charging time = about 30 to 45 minutes (for DJI Phantom)

## First-Person View Transmitters

Is a method used to control a radio-controlled vehicle from the driver or pilot's view point. The vehicle is either driven or piloted remotely from a first-person perspective via an **onboard camera**, fed wirelessly to video fpv **goggles** or a **video monitor**. More sophisticated setups include a pan-and-tilt **gimbaled camera** controlled by a gyroscope sensor in the pilot's goggles and with dual onboard cameras, enabling a true stereoscopic view<sup>18</sup>.

## Insurance

There exist insurance providers for your drone, for instance: UR Unmanned Risk Management (<http://unmannedrisk.com/>)

<sup>17</sup> 17 Yeager, C. (2015, June 19). How to Choose a Camera Drone for Aerial Photography. Retrieved April 25, 2016, from <http://photography.tutsplus.com/tutorials/how-to-choose-a-camera-drone-for-aerial-photography--cms-24225>

<sup>18</sup> First-person view (radio control). (n.d.). Retrieved April 25, 2016, from [https://en.wikipedia.org/wiki/First-person\\_view\\_\(radio\\_control\)#cite\\_note-FPV\\_Goggles\\_For\\_Drones\\_And\\_Experience\\_The\\_Thrill\\_Of\\_Flying-1](https://en.wikipedia.org/wiki/First-person_view_(radio_control)#cite_note-FPV_Goggles_For_Drones_And_Experience_The_Thrill_Of_Flying-1)



# Items related to drone flying

## Main items:

- Drone
- Remote controller
- Actioncam
  - GoPro
  - Gimbal (with actioncam)
- Spare batteries (phantom 4)
  - fire-proof pouch
- Propellors
- Cables
  - tablet/phone cable
- SD cards

## Other gear

- Landing gear (extra)
- (Sun)glasses
- Keys
- Wallet
- Landing platform
- Waterproof rain shield
- Countdown timer
- Foldable chair

## Important items

- Tablet/cellphone
- Water bottle
- Laptop
- Paperwork
- Monitor hood (folded)
- Repair tools
- FPV goggles
- Chargers
  - Laptop charger
  - Battery charger
- Tripod
- Camera
- Lenses
- Propellor protectors
- Neck strap

# RULES ON DRONES

Basic national safety rules apply, but the rules differ across the EU and a number of key safeguards are not addressed in a coherent way. The European Aviation Safety Agency is working on providing new rules for operating civil drones<sup>19</sup>. The animation below introduces do's and don'ts in relation to the use of civil drones.



Derived from the animation above and from other sources, a list of general rules is compiled:

## Do:

- Keep your drone in sight at all time
- Choose an unobstructed site
- Plan your flight
- Check your drone before flight
- Read the instructors manual
- Keep away from airports and helipads
- You are responsible for avoiding collision
- Only fly at daytime
- Always give priority to other traffic

- You must have permission to do paid work with your drone

## Do not:

- Fly in any way that could danger anyone
- Fly overhead people properties or vehicles
- Fly within 50 meters of people, properties or vehicles
- Fly higher than 150 metres from the ground
- Fly near aeroplanes or helicopters

More specific rules can be found for the concerning country, these rules per country can (for instance) be found on Dronelaw.in.

<sup>19</sup> EASA. (n.d.). Civil drones (Unmanned aircraft). Retrieved May 13, 2016, from <https://www.easa.europa.eu/easa-and-you/civil-drones-rpas>

**Registration:**

In the EU, the FAA announced that before the 17th of February, all drones should be registered. Anyone who owns a small unmanned aircraft that weighs more than 250g and less than 25kg, must register with the Federal Aviation Administration's UAS registry before they fly outdoors. People who do not register could face civil and criminal penalties. The owner must be 13 years of age or older. (If the owner is less than 13 years of age, another person 13 years of age or older must register the small unmanned aircraft). At registration, a numberplate-like code will be sent to the pilot which he has to attach to his drone.

# P

# BACKPACK SCENARIO











## COMPARISON TABLE

CRITERIA	GAMES FOR DRONES	MOUNTS	KITS	DRONE CARRYING	TARGET GROUP
INDUSTRY SIZE	+	+/-	+/-	++	—
PROFITABILITY	+	+	+	++	+
LINE-UP POSSIBILITY	++	+	+/-	++	++
UNIQUENESS	++	+	++	+	++
BRANDING OPPORTUNITY	+	+/-	+	++	+
SUITS CORE BUSINESS	+/-	+	+	++	O
COMPETITION	++	+	++	+/-	++

The table shows that for the set criteria, games for drones and drone carrying (a backpack) seem to be the best options. Target group focus could be combined for these two. Ratings are based on previous research, and Red Pimiento's and my opinions.

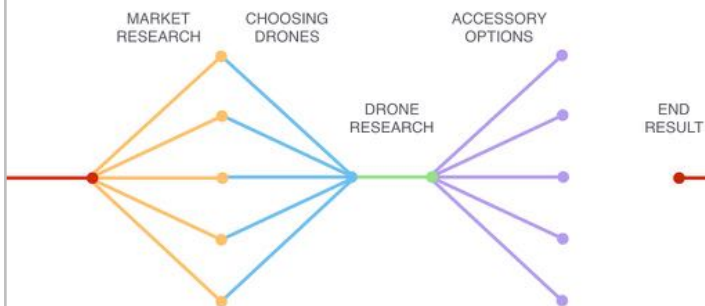
# PRESENTATION DRONE ACCESSORIES

## DRONE ACCESSORIES

RED PIMIENTO

- So Far
- Accessory categories
- Comparison table

2/12



3/12

### GAMES FOR DRONES

drone racing  
games & toys  
lasertag

### MOUNTS

cellphone mount  
drone delivery  
other mounts

### DRONE CARRYING

backpacks/cases  
other carriers  
camera combined  
waterproof/modular

### CASES/KITS

cleaning/repair  
games/racing  
minidrone cases

### TARGET GROUP

woman  
children  
companies

4/12

### GAMES FOR DRONES



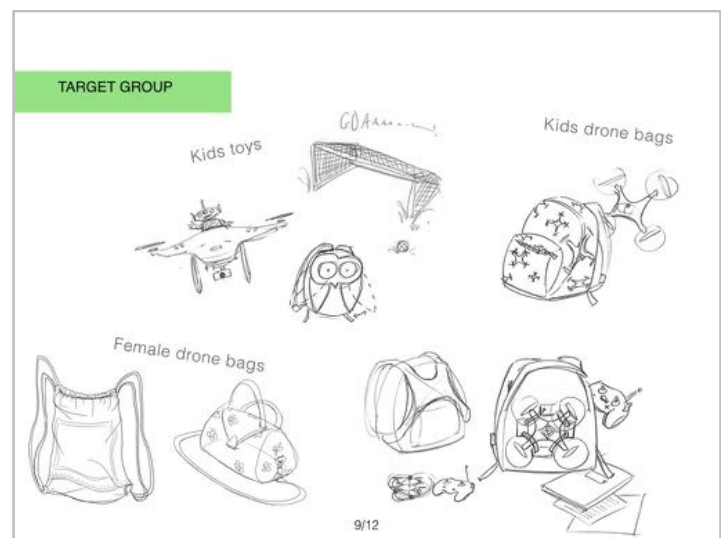
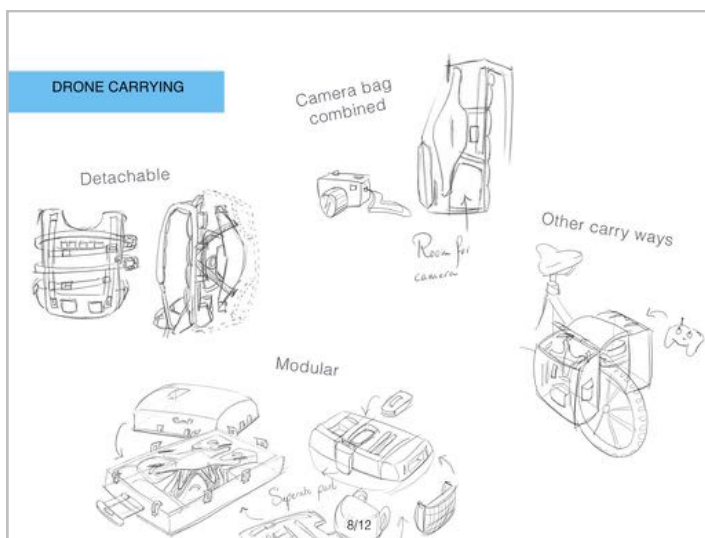
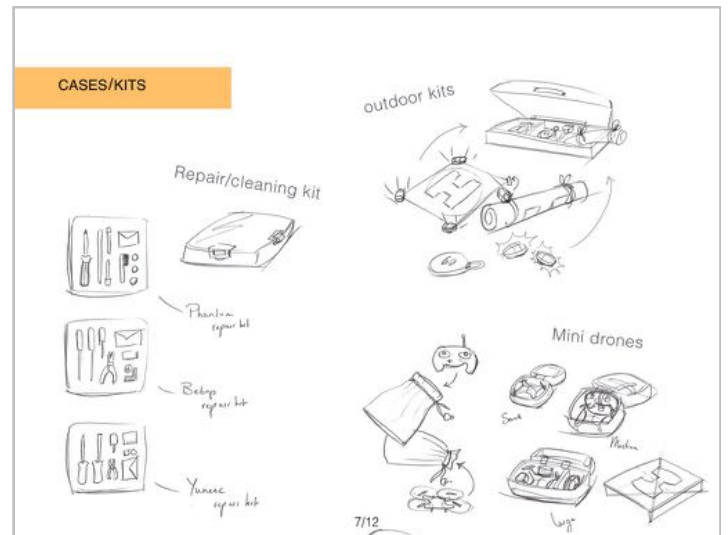
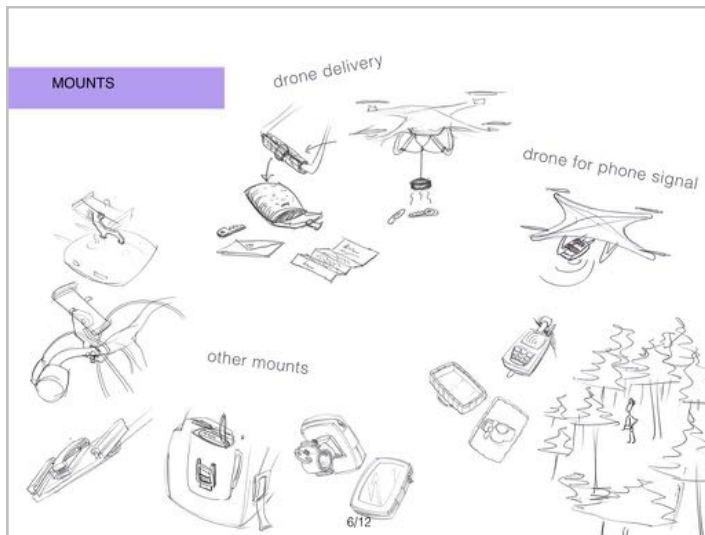
5/12

### GAMES FOR DRONES



5/12





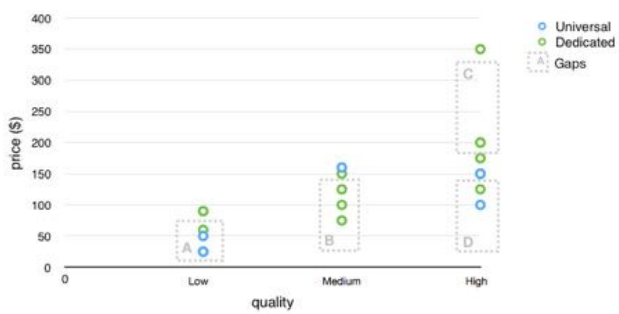
CRITERIA	GAMES FOR DRONES	MOUNTS	KITS	DRONE CARRYING	TARGET GROUP
INDUSTRY SIZE	+	+/-	+/-	++	-
PROFITABILITY	+	+	+	++	+
LINE-UP POSSIBILITY	++	+	+/-	++	++
UNIQUENESS	++	+	++	+	++
BRANDING OPPORTUNITY	+	+/-	+	++	+
SUITS CORE BUSINESS	+/-	+	+	++	O
COMPETITION	++	+	++	+/-	++

- Carrying accessories
  - Carrying accessories & target focus
  - Every reasonable idea
  - Other category or idea
- 12/12

## APPENDIX



### UNIVERSAL AND DEDICATED BACKPACK MARKET



### DRONES FOR KIDS

1-24 of 48,923 results for Toys & Games : "drone"

#### Toys Age Range

- ☐ Birth to 24 Months (2,139)
- ☐ 2 to 4 Years (3,099)
- ☐ 5 to 7 Years (2,118)
- ☐ 8 to 13 Years (6,571)
- ☐ 14 Years & Up (25,098)

#### Price

- ☐ Under \$25 (18,560)
- ☐ \$25 to \$50 (9,240)
- ☐ \$50 to \$100 (8,381)
- ☐ \$100 to \$200 (4,847)
- ☐ \$200 & Above (3,023)



<http://www.swizadronebackpack.com/>

<http://www.browserbag.com/>

# KIDS BACKPACK

Below an idea for a Kids' Drone Backpack. The idea is based on a kids' backpack Red Pimiento has made before. The bottom compartment is added for safely and easily carrying a drone. The flap contains two blow-up pouches, so that it provides perfect fit and protection for several drone sizes. The illustrations are added for making it a drone backpack, the colours could be added for gender based targeting.



# LANDING PAD

## Short exploration of landing pad design

Most professional pick:

[http://www.bestemaerial.com/Heavy-Duty-Landing-Mat-Helipad-for-DJI-Phantom-1234-Vision-Vision-Professional-Advanced-and-all-other-models-The-Drone-Design\\_p\\_32.html](http://www.bestemaerial.com/Heavy-Duty-Landing-Mat-Helipad-for-DJI-Phantom-1234-Vision-Vision-Professional-Advanced-and-all-other-models-The-Drone-Design_p_32.html)

item



item

(50\$)

item



item

<https://www.amazon.com/Bestem-Aerial-BT-INSPIRE-MAT-Inspire-Landing/dp/B011N94IYK>



(60\$) (weight: 37,5 kilos) (76cm/30" diameter)

## AMAZON review:

Excellent product. The heavy rubber prevents fly away from the Inspire propwash on landing. My only complaint is in the packaging. The top of the mat was right up against the tape on the box. I was very careful not penetrating the box with the scissors but i was shocked that the top surface had a long cut on it when I opened up the box.



It rolls up for easy transport and flattens the grass or covers dirt, sand or whatever to protect the delicate camera lens and undercarriage from anything kicked up by prop wash. It may appear to be a luxury, but really is a necessity for any flyer. Heavy weight stays out without stakes or additional weights. Very convenient and fun to practice pinpoint landings.

Its a great mat---eye catching design and heavy enough that an Inspire lifting off from it does not cause it to move at all. I would give it five stars, but the price is a bit steep, even for a quality landing mat like this one.

## Forum:

I just use regular board game. I'm sure many of us have these tucked away. They fold nicely into a 9in square and very portable.

You can buy generic blank one on Amazon for less than \$10. It's sturdy enough not to be blown away during take off and it won't interfere with the VPS system.



"Aluminium interferes with the compass"

## The XTrac Landing Pad

(14\$)

(weight = 370 grams)

The XTracGear Drone XL Drone Land Pad just didn't work for me. I liked it..it was highly portable and looked good with the target "X" on it. Unfortunately, it doesn't work with a Phantom 3 Advanced. I used it to launch from a grass field and that was great. But when I returned the aircraft to land, prop wash blew the pad away. I tried a second time with the same results. I guess it needs too weigh more or come with tie downs. Returned it.



Nothing but a glorified "MOUSE PAD". The product has "XL Drone Landing Pad", in its description. Maybe for one of those 4" micro drones, but nothing anyone would seriously fly. Plus, given the price and the fact that I really wanted these to be cool, but we literally use them around the hangar as computer mouse pads.

Websites providing landing pads:

<http://www.uav.graphics/> (22 - 150 \$)

<http://www.uav.graphics/> (50 \$)

<http://www.bestemaerial.com/> (50 \$)

Amazon

Ebay

APPENDIX

RED PIMIENTO TO CONSUMER

## Material options

[https://www.alibaba.com/product-detail/Melors-Number-Cut-Pattern-Mixed-Color\\_60443734032.html?spm=a2700.7724838.0.0.4CdpYN](https://www.alibaba.com/product-detail/Melors-Number-Cut-Pattern-Mixed-Color_60443734032.html?spm=a2700.7724838.0.0.4CdpYN)

[https://www.alibaba.com/product-detail/Custom-Funny-Footprint-Butterfly-Anti-Slip\\_60349712642.html?spm=a2700.7724838.0.0.THKEwo&s=p](https://www.alibaba.com/product-detail/Custom-Funny-Footprint-Butterfly-Anti-Slip_60349712642.html?spm=a2700.7724838.0.0.THKEwo&s=p)

[https://wholesaler.alibaba.com/product-detail/2016-new-design-eco-friendly-pvc\\_60397204595.html?spm=a2700.7724838.0.0.CZkHha](https://wholesaler.alibaba.com/product-detail/2016-new-design-eco-friendly-pvc_60397204595.html?spm=a2700.7724838.0.0.CZkHha)

## Conclusion:

The landing mat should either be rollable or foldable  
Have clear markings (this could be glow in the dark, or attachable lights)  
Should weight more than 0,5 kilos -> 2 kilos (?)  
Should be water-resistant  
Should not wear off easily  
Could also be appropriate for setting up drone

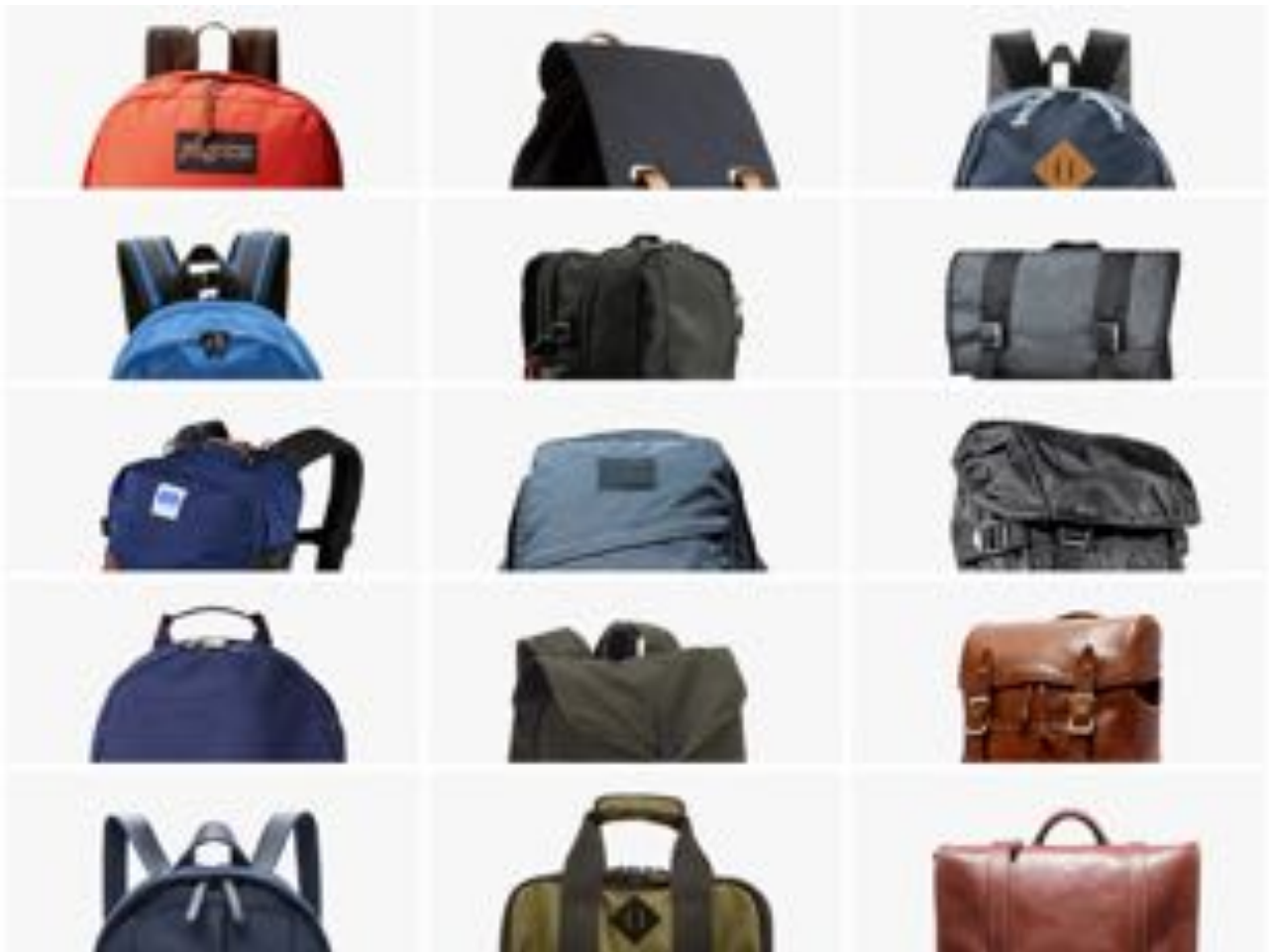
## Design Suggestions

(.psd files available)



U

# VISUALS OF DIFFERENT KINDS OF BACKPACKS



**BRANDNAME: POLER**SOURCE: <http://www.polerstuff.com/collections/bags>

EXTRA DESCRIPTION: Large enough to carry a family picnic, 18 beers, or a DSLR with several lenses and accessories using the included padded camera insert. The padded camera insert is modular. Finally, you can strap the whole thing to the rack on the front of your bike and use it as a porteur style bag



EXTRA DESCRIPTION: trans continental excursion. Featuring a clever dual entry system and dual internal compartments to keep your wet and filthy stuff separate from your fresh and clean stuff. As you travel, shift the dirty stuff over to the other side and keep everything nice and tidy. For surfing and other wet adventures the inner bag is





EXTRA DESCRIPTION: The removable side pouches are perfect for a water bottle, snacks or those smaller essentials you need easy access to. Take the pouches off and you've got two internal organizers or dopp kits at your disposal. The main compartment features a drawstring closure and a padded laptop sleeve with a zip pocket lid



EXTRA DESCRIPTION: Rolltop bag. The laptop compartment is accessible from the outside, and the front of the bag has a large accessory pocket as well as loops to connect a [Goal Zero solar panel](#) to the outside. For cyclists, the slim profile of the bag leaves your blind spot unobstructed. The side cinch straps [allow you to size the bag up or down](#) depending on your load, and the addition of a sternum strap keeps the bag squarely on your shoulders for even weight distribution.



Extra bag accessory



EXTRA DESCRIPTION: Made of strong, lightweight ripstop fabric, this bag packs into its own tiny stuff sack when not in use. [Keep it in the accessory pocket of your Polar backpack](#) or the glove compartment of your car and always be prepared for those moments when you need another bag.



EXTRA DESCRIPTION: Sized perfectly for a weekend trip and fits within the carry on size guidelines for most airlines worldwide. There are two small pockets for accessories, one inside and one on the outside, as well as straps on the bottom of the bag to accommodate a skateboard. High quality leather accents including a beefy hand grip round out



*Etui for propellers?*



## BRANDNAME: DAKINE

SOURCE: <http://eu.dakine.com>



EXTRA DESCRIPTION: Vertical board carry straps. Removable padded camera block. Tripod carry system. Main compartment access to camera gear, Side organizer pockets. Deployable rain cover. Padded waist belt. Adjustable sternum strap. Deployable water bottle pocket



*Deployable hip pack  
for in the field?*



EXTRA DESCRIPTION: Padded laptop sleeve. Fits most 17" laptops. **Modular hip pack**. Cinch side pockets. Quick access pocket. Adjustable sternum strap. Side access. Deployable water bottle pocket.



EXTRA DESCRIPTION: **Deployable cinchpack**. Two exterior pockets







drone VR goggles compartment



EXTRA DESCRIPTION: Vertical snowboard carry. Retractable cable ski carry. Snow tool / shovel pocket. Insulated hydro sleeve. Fleece lined goggle pocket. Padded waist belt. Integrated rescue whistle / sternum strap.



EXTRA DESCRIPTION: 3L / 100oz Hydrapak® reservoir w/ quick disconnect. High-flow Blaster bite valve w/ shut-off. Air Mesh suspended backpanel. Breathable ergonomic shoulder straps. Full face or trail helmet carry. Deployable armor carry straps. Fleece-lined sunglass pocket. Magnetic hydration hose clip. Reflective logo



Storage landing pad



Trolley option







EXTRA DESCRIPTION: Vertical board carry straps. *Photo specific main compartment*. Padded laptop sleeve Fits most 17" laptops. Tripod carry. *Multiple internal pockets*. Deployable rain cover. Padded waist belt. Adjustable sternum strap. Compression molded backpanel. Water Bottle pocket.



# SIZES OF POPULAR DRONE MODELS

★ = suitable for The Drone Backpack



## DJI PHANTOM 4

Wingspan including props	590 mm
Wingspan excluding props	350 mm
Weight incl batteries & props	1,380 g
Price	\$ 1,400
Remote Controller	230x100x210 mm



## DJI PHANTOM 3 PROFESSIONAL

Wingspan including props	590 mm
Wingspan excluding props	350 mm
Weight incl batteries & props	1,280 grams
Price	\$ 1,000
Remote Controller	230x100x210 mm



## DJI PHANTOM 3 ADVANCED

Wingspan including props	590 mm
Wingspan excluding props	350 mm
Weight incl batteries & props	1,280 g
Price	\$ 1000
Remote Controller	230x100x210 mm



## DJI PHANTOM 3 STANDARD

Wingspan including props	590 mm
Wingspan excluding props	350 mm
Weight incl batteries & props	1,380 g
Price	\$ 1000
Remote Controller	230x100x210 mm



## DJI INSPIRE 1 / INSPIRE 1 PRO

Wingspan including props	980 mm
Wingspan excluding props	630 mm
Weight incl batteries & props	2,935 g
Price	\$ 2,900
Remote Controller	230x100x210 mm



## XIRO EXPLORER G

Wingspan including props	510 mm
Wingspan excluding props	350 mm
Weight incl batteries & props	1,220 g
Price	\$ 400
Remote Controller	approx. 200x200x100



### 3D ROBOTICS SOLO

Wingspan including props	720 mm
Wingspan excluding props	460 mm
Weight incl batteries & props	1,500 g
Price	\$ 1,000
Remote Controller	approx. 200x200x100



### HORIZON BLADE CHROMA

Wingspan including props	720 mm
Wingspan excluding props	470 mm
Weight incl batteries & props	1,300 kg
Price	\$ 1,500
Remote Controller	approx 200x200x100



### PARROT BEBOP 1

Wingspan including props & guards	600 mm
Wingspan including props	580 mm
Wingspan excluding props	430 mm
Weight incl batteries & props	420 g
Price	\$ 500
Remote Controller (optional)	370 x230x190mm





## AEE AP10/AP11/AP12

Wingspan including props	700 mm
Wingspan excluding props	450 mm
Weight incl batteries & props	1,400 g
Price	\$ 800
Remote Controller	approx 200x150x100 mm



## WALKERA RUNNER

Wingspan including props	520 mm
Wingspan excluding props	300 mm
Weight incl batteries & props	530 g
Price	\$ 260
Remote Controller	210x190x50 mm



## YUNEEC Q500 TYPHOON

Wingspan including props	980
Wingspan excluding props	665
Weight incl batteries & props	1,130 g
Price	\$ 1,950
Remote Controller	190x240x120

**Sources:**

<http://myfirstdrone.com/tutorials/buying-guides/best-drones-for-sale/>

<http://4k.com/drones-for-sale/>

<http://www.theverge.com/2014/7/31/5954891/best-drone-you-can-buy>

[http://www.amazon.com/Best-Sellers-Toys-Games-Hobby-RC-Quadcopters-Multirotors/zgbs/toys-and-games/11608080011/ref=zg\\_bs\\_nav\\_t\\_5\\_166591011](http://www.amazon.com/Best-Sellers-Toys-Games-Hobby-RC-Quadcopters-Multirotors/zgbs/toys-and-games/11608080011/ref=zg_bs_nav_t_5_166591011)

<http://www.pcmag.com/roundup/337251/the-best-drones>

W

# [IDEATION]

## DRONE ACCESSORIES



# X

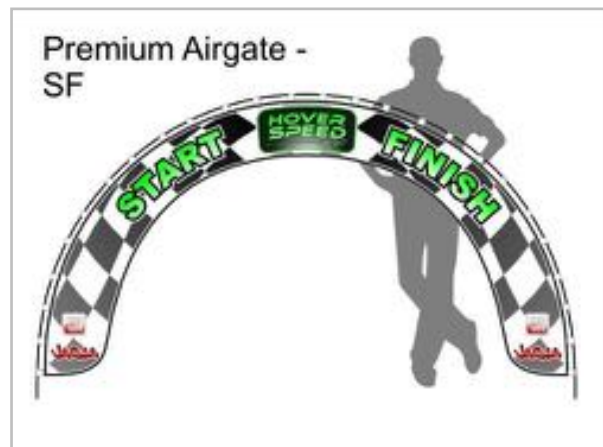
## GAME OF DRONES

Some products already exist, or relate to drone games, drone racing or toys in general.



Left: <https://www.drone-zaak.nl/parrot-racing-pylon> (€ 54,90)

Right: <http://www.gooutdoorsaustralia.com.au/shop/fpv-racing/race-accessories.html> (€ 180,-)



<http://www.hoverspeedrc.co.uk/ourshop/>  
FPV Racing flag: Left €50, right €90. Airgate: €80





“A full FPV flag race track in a single carry bag (in production nog)” €90  
[http://www.hoverspeedrc.co.uk/ourshop/prod\\_4784229-NEW-PRODUCT-Quicktrack-Pro.html](http://www.hoverspeedrc.co.uk/ourshop/prod_4784229-NEW-PRODUCT-Quicktrack-Pro.html)



Left: <http://www.blackrockrc.com/airgate.html>  
 Right: <https://www.drone-zaak.nl/parrot-donut-challenge>

For designing racing track accessories, other relevant products can be used for inspiration:



Left: <http://www.amazon.com/Kids-Hoops-Cones-Poles-Clips/dp/B004OYGH28/>  
 Right: <http://www.amazon.com/Pull-Bouy-Inc-Foam-Holders/dp/B00R8PX8XG/>

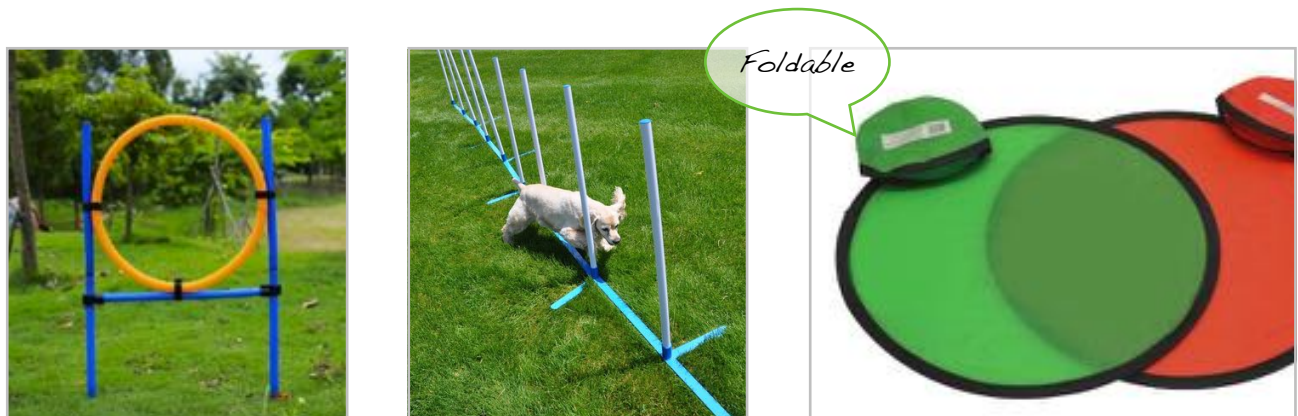


Left: [http://www.amazon.com/Gamma-First-Court-Marker-Assorted/dp/B000W49VOA/ref=sr\\_1\\_3?ie=UTF8&qid=1464083414&sr=8-3&keywords=gamma+training+dome+cones](http://www.amazon.com/Gamma-First-Court-Marker-Assorted/dp/B000W49VOA/ref=sr_1_3?ie=UTF8&qid=1464083414&sr=8-3&keywords=gamma+training+dome+cones)  
 Right: [http://www.amazon.com/American-Educational-Piece-Straight-Marker/dp/B00657OH56/ref=pd\\_sim\\_21\\_1?ie=UTF8&dpID=41leCrezE6L&dpSrc=sims&preST=AC\\_UL160\\_SR136%2C160\\_&refRID=1G8NMBJ8AC8DMP3EZ4D9](http://www.amazon.com/American-Educational-Piece-Straight-Marker/dp/B00657OH56/ref=pd_sim_21_1?ie=UTF8&dpID=41leCrezE6L&dpSrc=sims&preST=AC_UL160_SR136%2C160_&refRID=1G8NMBJ8AC8DMP3EZ4D9)





Left: <http://www.amazon.com/dp/B019C3GVDK?psc=1>  
 Middle: [http://www.amazon.com/Champion-Sports-Square-Activity-Mats/dp/B000KA4OK2/ref=pd\\_rhf\\_dp\\_s\\_cp\\_36?ie=UTF8&dpID=31%2BG7duqZsL&dpSrc=sims&preST=SL500SR135%2C135&refRID=0H937XYFFK605Z10WJ7D](http://www.amazon.com/Champion-Sports-Square-Activity-Mats/dp/B000KA4OK2/ref=pd_rhf_dp_s_cp_36?ie=UTF8&dpID=31%2BG7duqZsL&dpSrc=sims&preST=SL500SR135%2C135&refRID=0H937XYFFK605Z10WJ7D)  
 Right: <http://www.amazon.com/Sports-Hoop%C2%AE-Excercise-Dia-40-5-Exercise/dp/B001GBMXX4/>



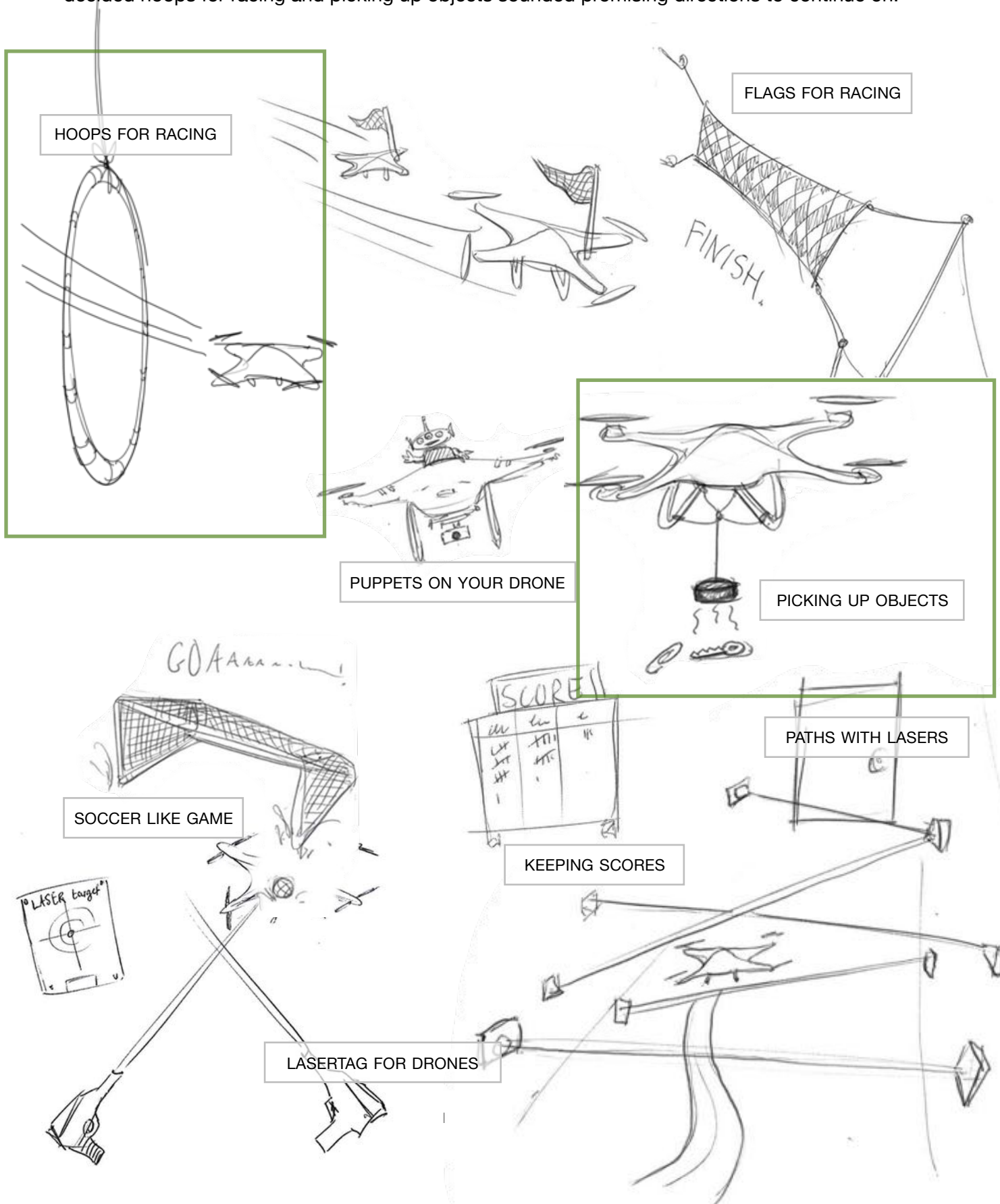
Left: [http://www.amazon.com/Namsan-Training-Agility-Starter-Equipment/dp/B00YCDHK6S/ref=pd\\_sim\\_199\\_10?ie=UTF8&dpID=61BoKDw6QpL&dpSrc=sims&preST=ACUL160SR160%2C160&refRID=0KYNF0A7PSSMSM09YMNX](http://www.amazon.com/Namsan-Training-Agility-Starter-Equipment/dp/B00YCDHK6S/ref=pd_sim_199_10?ie=UTF8&dpID=61BoKDw6QpL&dpSrc=sims&preST=ACUL160SR160%2C160&refRID=0KYNF0A7PSSMSM09YMNX)  
 Middle: [http://www.amazon.com/Agility-Weave-Adjustable-Carrying-Stakes/dp/B00AWM69H4/ref=pd\\_bxgy\\_199\\_img\\_3?ie=UTF8&refRID=0F3GAH5WF2AT24EY19MY](http://www.amazon.com/Agility-Weave-Adjustable-Carrying-Stakes/dp/B00AWM69H4/ref=pd_bxgy_199_img_3?ie=UTF8&refRID=0F3GAH5WF2AT24EY19MY)  
 Right: [http://www.amazon.com/dp/B00NFSE12M/ref=pd\\_lpo\\_sbs\\_dp\\_ss\\_1?pf\\_rd\\_p=1944687542&pf\\_rd\\_s=lpo-top-stripe-1&pf\\_rd\\_t=201&pf\\_rd\\_i=B005HLW8N4&pf\\_rd\\_m=ATVPDKIKX0DER&pf\\_rd\\_r=1VQQCS2XJ](http://www.amazon.com/dp/B00NFSE12M/ref=pd_lpo_sbs_dp_ss_1?pf_rd_p=1944687542&pf_rd_s=lpo-top-stripe-1&pf_rd_t=201&pf_rd_i=B005HLW8N4&pf_rd_m=ATVPDKIKX0DER&pf_rd_r=1VQQCS2XJ)



Drone toys do not exist, but existing toys have been used as inspiration for designing drone toys

# IDEATION SKETCHES FOR DRONES

Ideation sketches below give an idea of options I came up with. Based on knowledge on drones and their users I have collected over time, and due to lack of time to further investigate this, I decided hoops for racing and picking up objects sounded promising directions to continue on.





Relevant for any ideas displayed above, Program Requirements are formulated

	Demand	Wish
Safety	Should be safe for user and bystanders	
	Should not cause damage to drone	
	Should withstand a crash of a flying drone	
Use	Should be able to be set up indoor	Should be able to set up indoor and outdoor
	Set up time of 5 minutes or less*	Set up time of 1 minute or less*
	Should be able to use indoor	Should be able to use indoor and outdoor
	Should be able to be use by children aged 8+, supervised by an adult**	Should be able to use by children aged 8+ **
	Should be able to store away	Should be able to store away in 3 minutes or less
	Should be usable for drones with a wingspan of 60 - 250 mm***	Should be usable for drones with a wingspan of 30 - 500 mm***
Other	Should provide a 'fun' element	
	Should weight less than 3 kilo's****	Should weight less than one kilo****
	Should be re-usable	
		Should be water-resistant

\* Indiction derived from field- and deskresearch. Most drones require no more than 5 to one minute(s) setup time. Game setup time should not exceed this.

\*\* Very small drones are advertised as appropriate for children aged 8+

\*\*\* Based on research on drone sizes in appendix .. *(At the end of this document)*

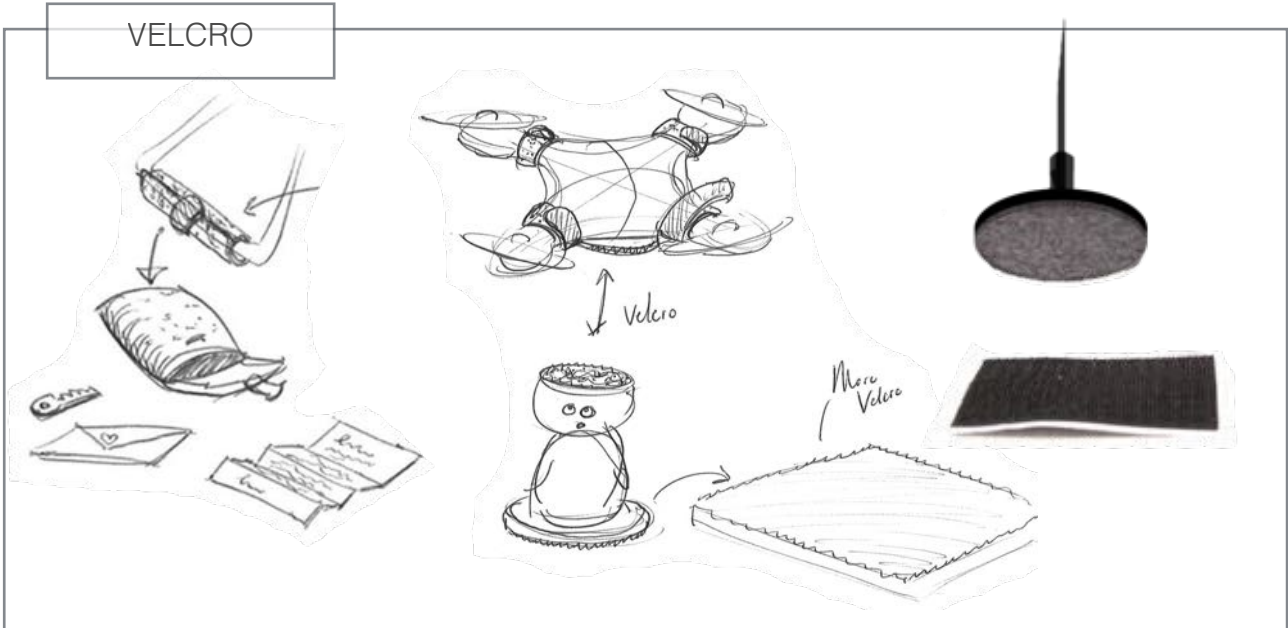
\*\*\*\* The weight an eight years old should be able to carry

## CONCEPT 1

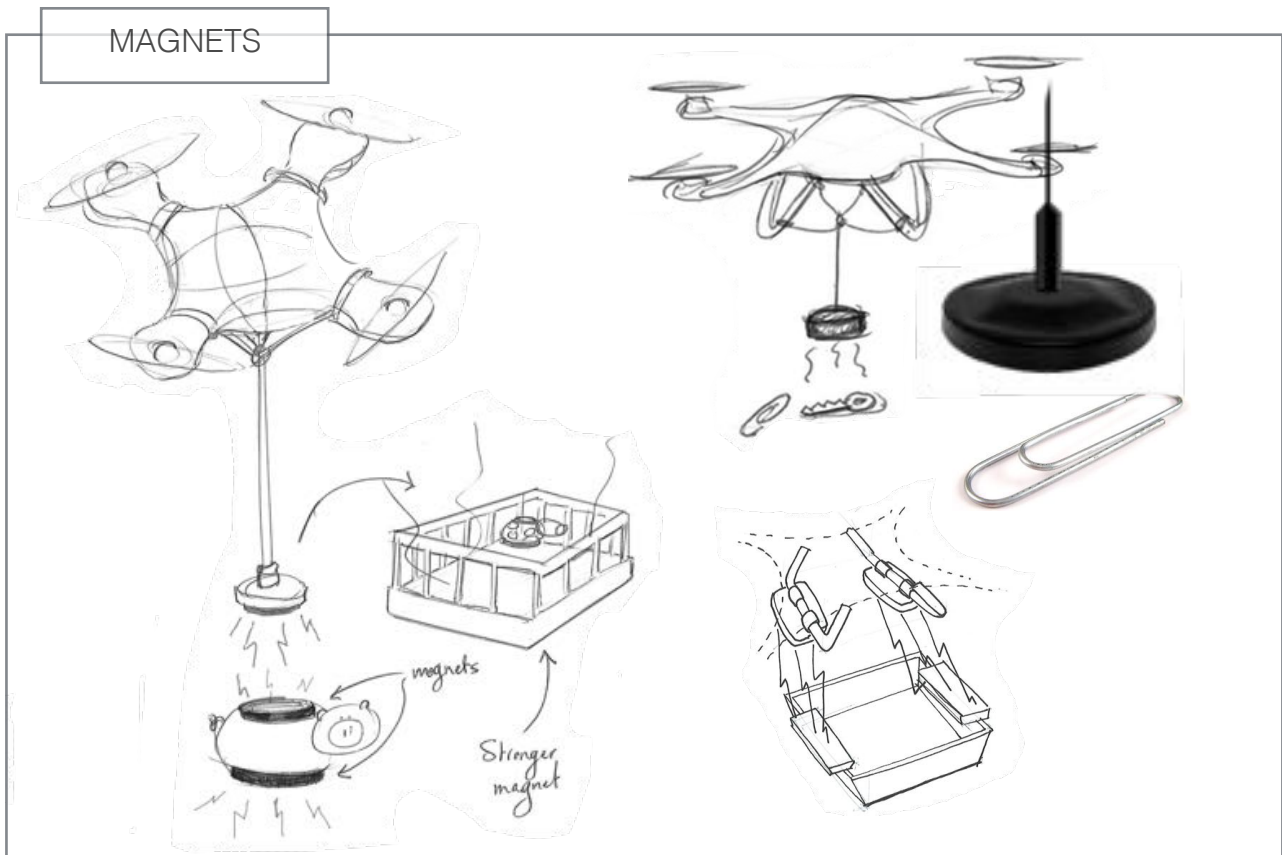
## THE TRANSPORT

First concept: The transport game. The idea of this game is that picking things up with your drone can be great fun and there are many ways of achieving this.

### VELCRO



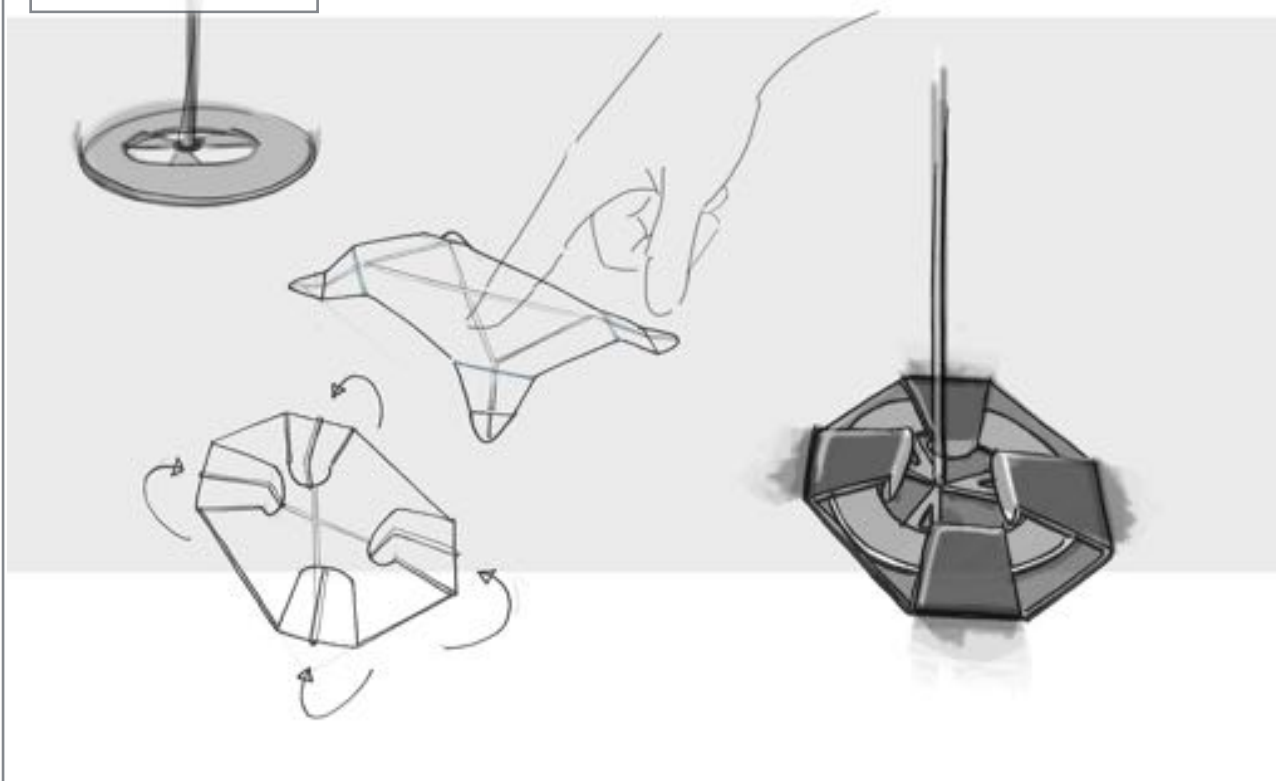
### MAGNETS



## HOOKS



## CLIPS



CONCEPT	PROS	CONS
VELCRO	Lightweight Easily attachable Easy use	declining appearance over time
MAGNET	Easy use	Heavy
HOOK	Large range of things to pick up	Hard to control
CLIP		Can not automatically release Need good aiming Need pressure to pick up

When comparing pros and cons of the ways for picking up, velcro and magnet appear to be the best choices. Velcro can be used for picking up small velcro containers or puppets, as illustrated below.

For releasing the load, one simply has to land on a velcro pad that provides a larger contact area. Due to the larger contact area, the load will stick to the pad when flying away.

Magnets could be used for the same end goal. For releasing the load, one has to land on a stronger magnet (or a magnet with a larger contact area) and fly away again.

### **The game**

The game can be great fun for one player or several players. The goal is to pick up small animals, like an UFO would do in movies, and drop them as quick as possible at the right location. When played with multiple players, the person who collected the most farm animals before they're all done wins! The farm animals can even be spread out through the whole room by someone else, for making the challenge even harder.





Instead of a game, the velcro package can also be delivered with funny or design pouches, such as illustrated below.



After additional research I discovered only medium sized drones (+/- 300 mm wingspan) are strong enough to carry items like a pen or a key.

Deciding between velcro and magnets, the pros and cons of practical usage are weighted against each other.

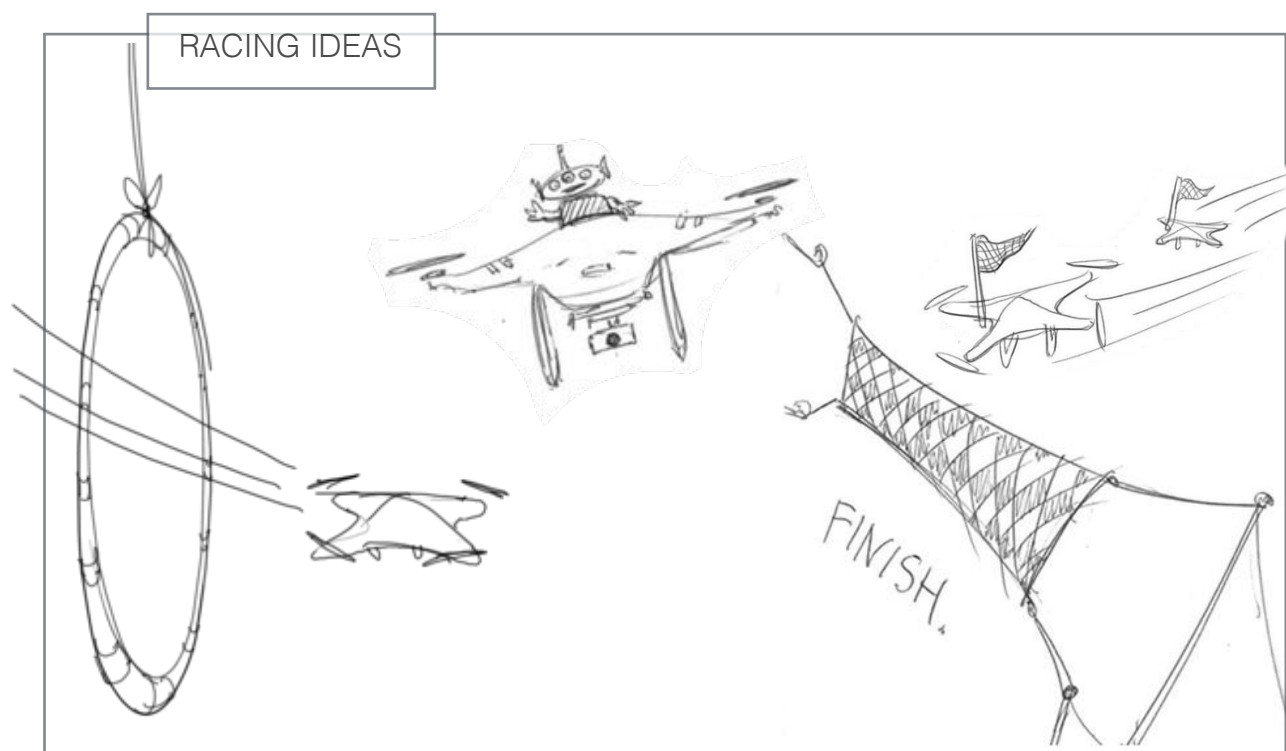
CONCEPT	PROS	CONS
VELCRO	Lightweight	<ul style="list-style-type: none"> <li>- Have to land on instable object</li> <li>- May not let go of object when landing on velcro mat</li> </ul>
MAGNET	Magnet automatically attaches to item	<ul style="list-style-type: none"> <li>- Heavy - Only be usable by medium sized drones</li> <li>- A hanging magnet may blow away by the wind of the propellers.</li> </ul>

For practical reasons, the velcro turns out to be the better choice: It is more lightweight and its use is not affected by the wind of the drones propellers.

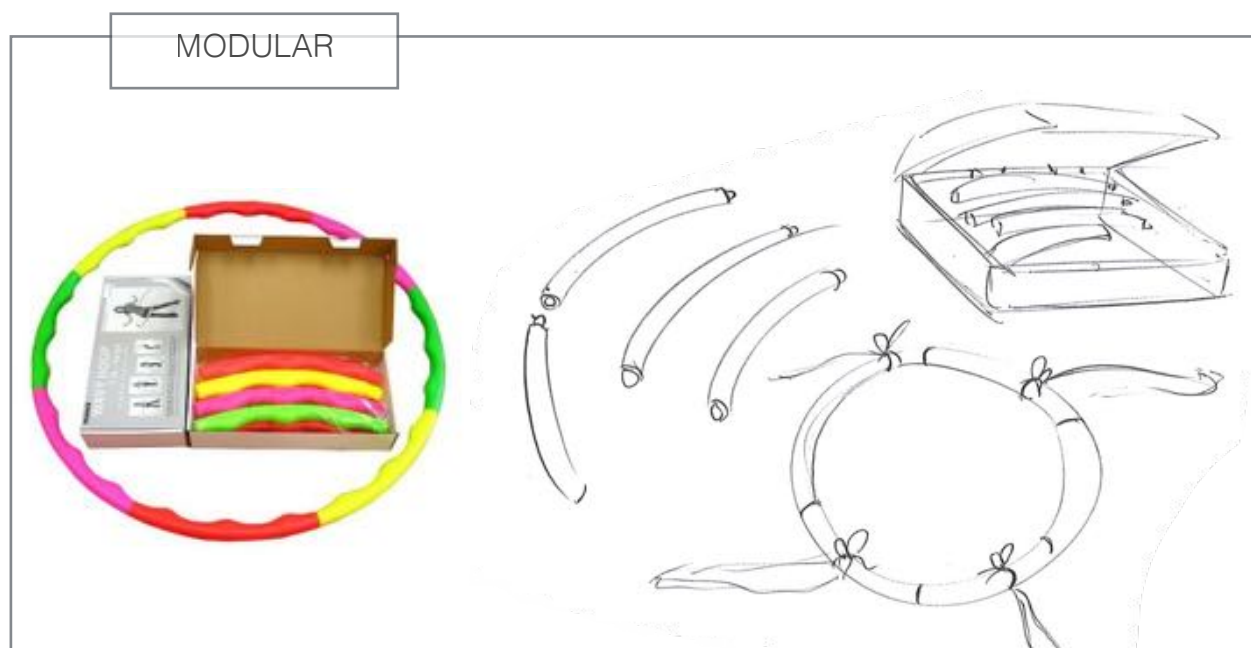
## CONCEPT 2

## MINI RACING

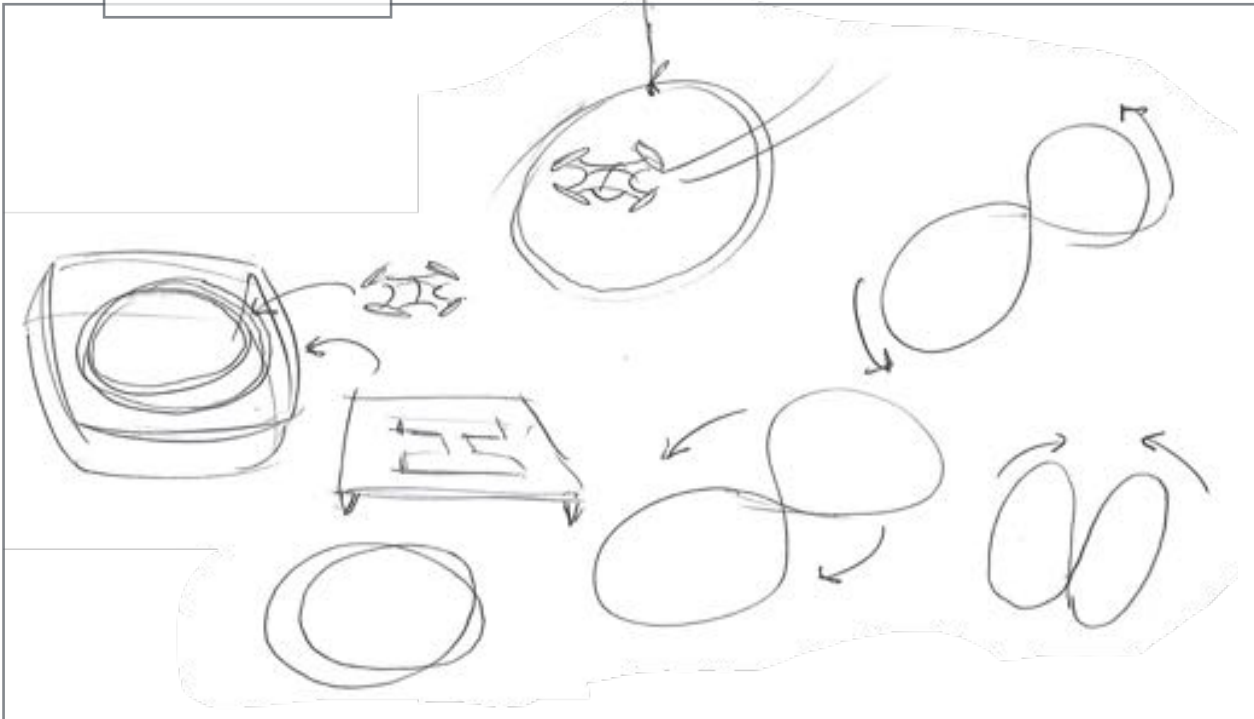
Drone racing does not have to be reserved for professionals. Drone races can be great fun for the young and less competent too. Below are some racing impressions.



Racing through hoops and loops with your own small drone is fun and very realisable for Red Pimiento. According to the program requirements, these hoops should at least be big enough for drones and quadcopter of 30 - 250mm wingspan to fly through. Such hoops should be attachable preferably indoor and outdoor and should be able to store away easily.



FOLDABLE



## CONCEPT

MODULAR

## PROS

Easy to store

## CONS

Takes time setting up  
Can fall apart  
May not withstand a crash

FOLDABLE

Easy to store  
Can be used as a big  
or a small hoop  
Does not fall apart

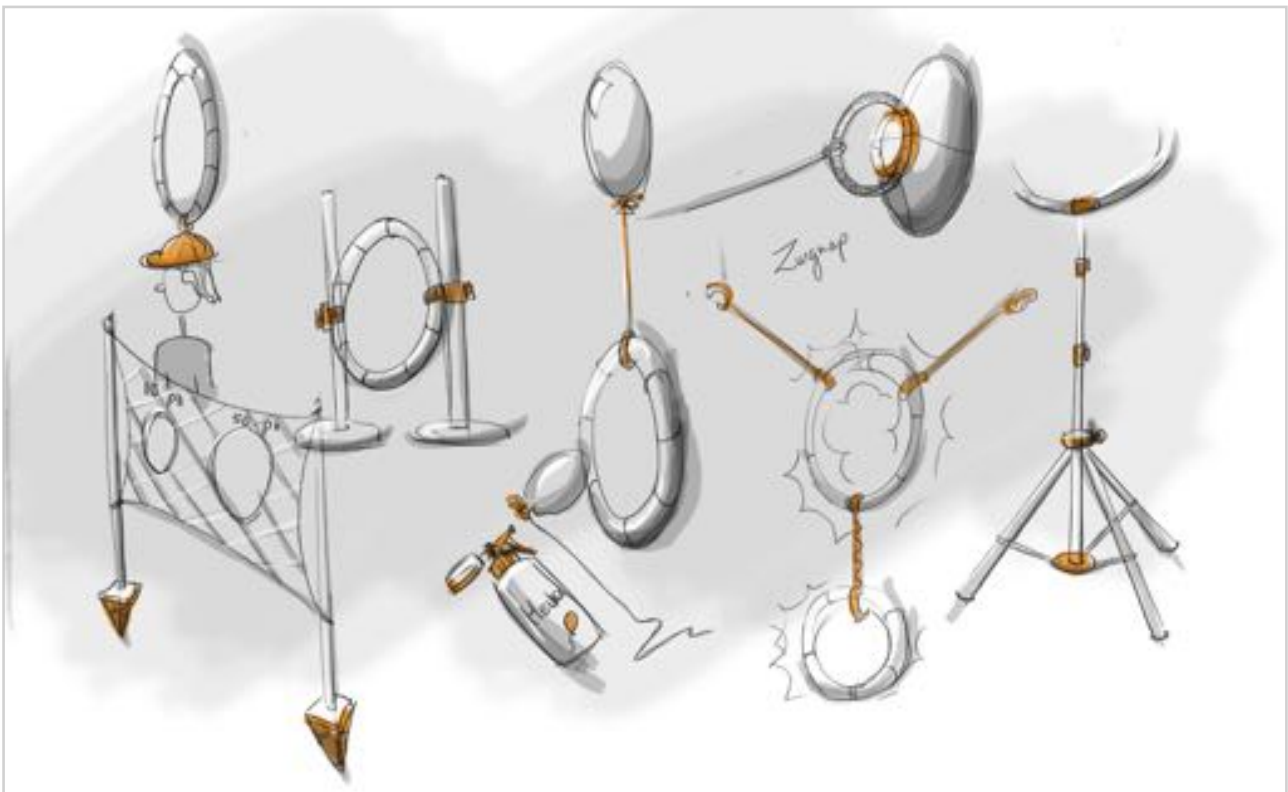
May lose its shape

The foldable option makes the most logical choice. The image below shows how it can easily be folded and stored in a small pouch.



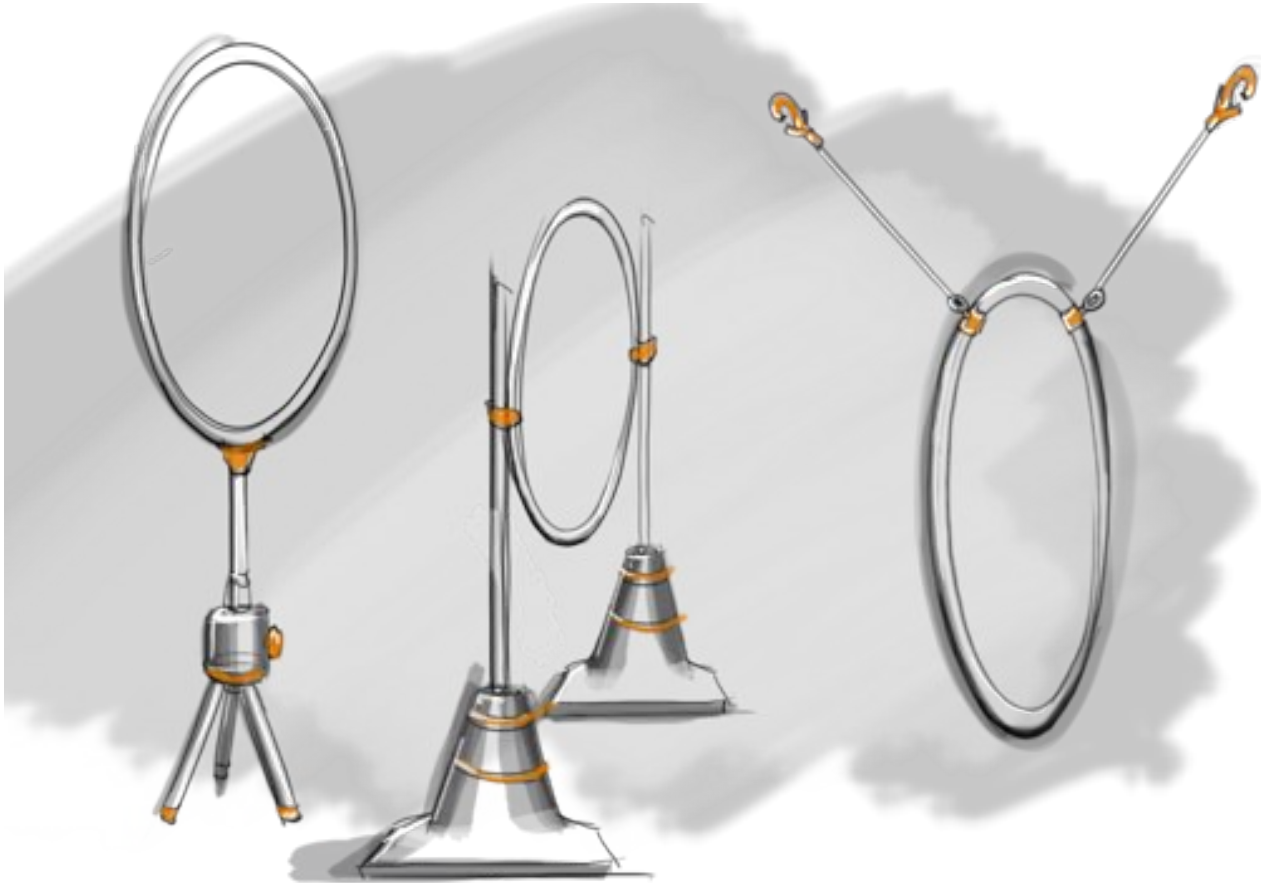


There are several ways a hoop could be hung up. It could be attached to rods connected to the ground, it could be held in the air by others (which is certainly not recommended), it could be held up by helium balloons or a tripod or by ropes with hooks, velcro or suction pads.



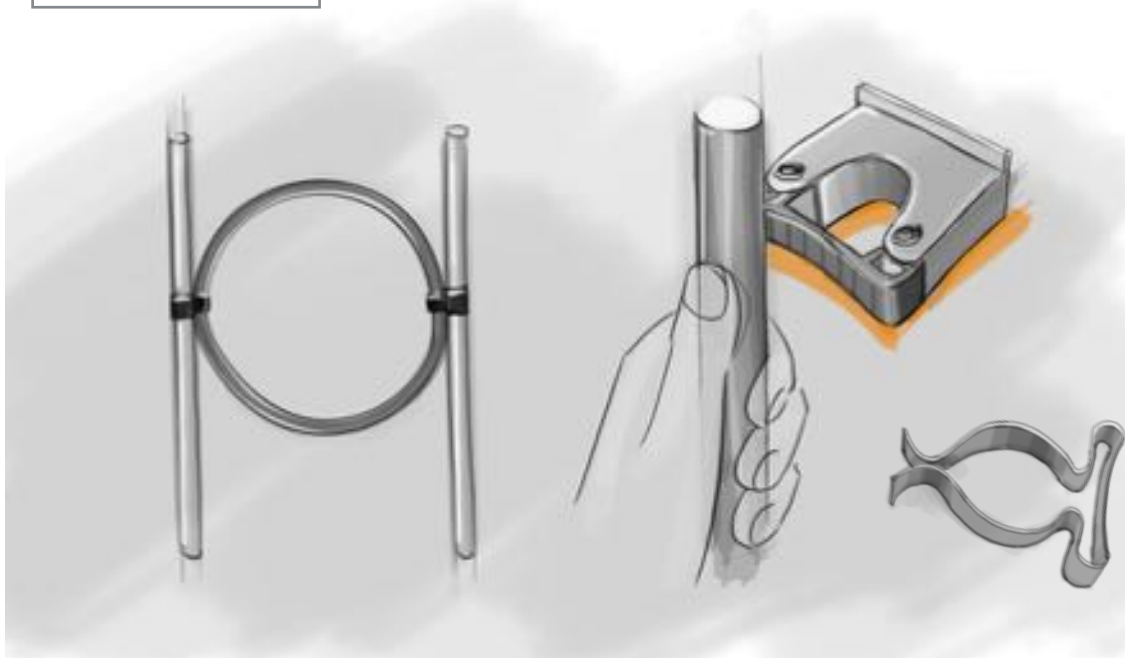
System	PROS	CONS
Poles on ground	<ul style="list-style-type: none"> <li>- Steady</li> <li>- Any environment</li> </ul>	<ul style="list-style-type: none"> <li>- Big</li> <li>- Should be relatively heavy to prevent falling over</li> <li>- Material may look cheap</li> </ul>
Helium balloon	<ul style="list-style-type: none"> <li>- Can be used anywhere</li> <li>- Looks fun</li> </ul>	<ul style="list-style-type: none"> <li>- Need helium equipment and filling</li> <li>- Can be dangerous to use</li> <li>- Not durable</li> <li>- Need exact right amount of helium</li> <li>- Inconvenient outdoor</li> </ul>
Held up by others	<ul style="list-style-type: none"> <li>- Can be used anywhere</li> </ul>	<ul style="list-style-type: none"> <li>- Dangerous</li> </ul>
Ropes	<ul style="list-style-type: none"> <li>- Can be hung in many ways</li> <li>- Lightweight</li> </ul>	<ul style="list-style-type: none"> <li>- Inconvenient in large open spaces</li> </ul>
tripod	<ul style="list-style-type: none"> <li>- Steady</li> <li>- Any environment</li> </ul>	<ul style="list-style-type: none"> <li>- Big</li> <li>- Heavy</li> <li>- Expensive</li> </ul>

Tripods, poles with ground pieces and ropes are good ways for hanging up the hoops.



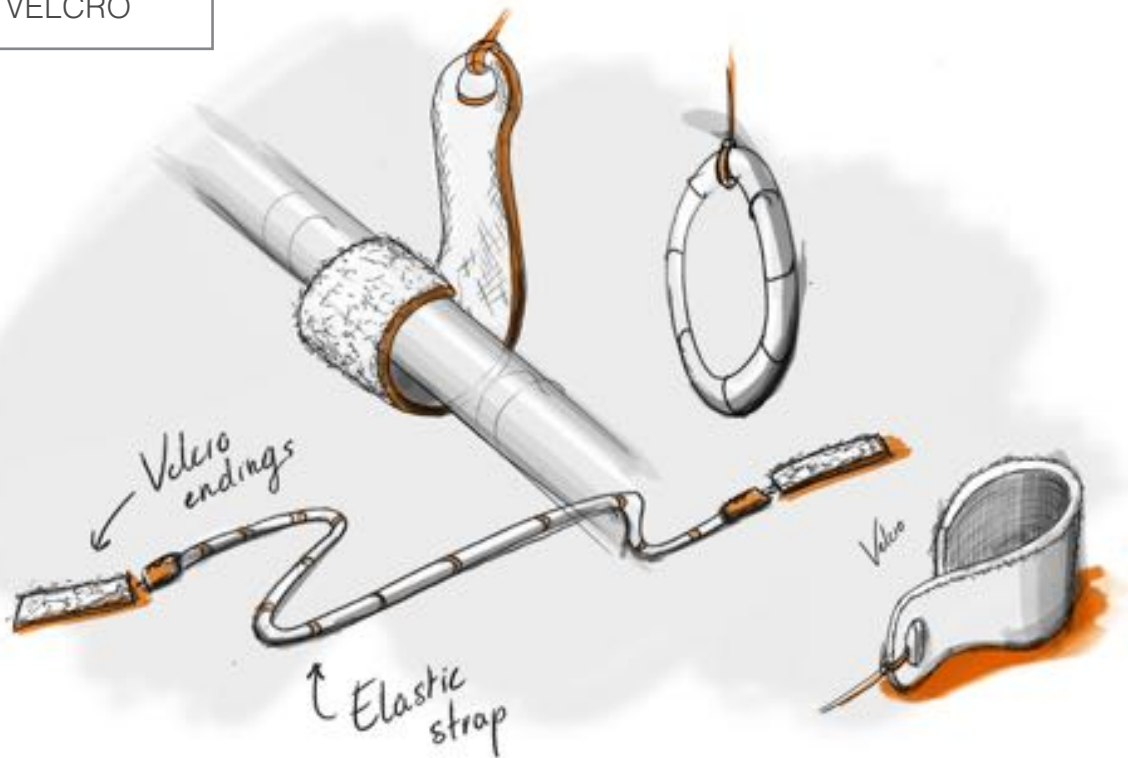
Lets look at some more way for setting up the hoops. The pressure-clipping system to connect it to the pole could be an easy metal press-clip, or more advanced ones. The clip marked with orange gives is more sturdy and high-end look.

Pressure-clip



Other ways for attaching to the hoop or environment are

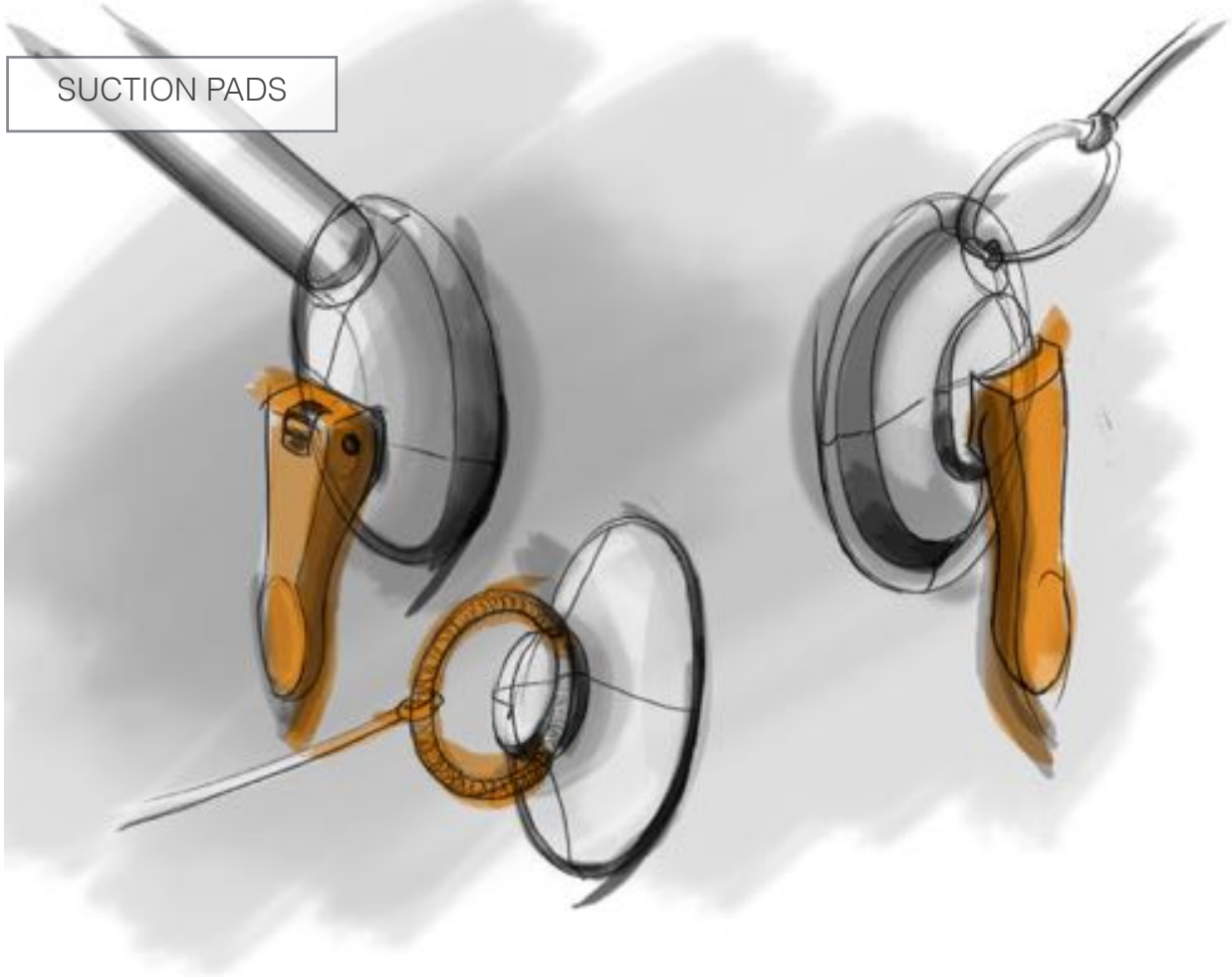
VELCRO



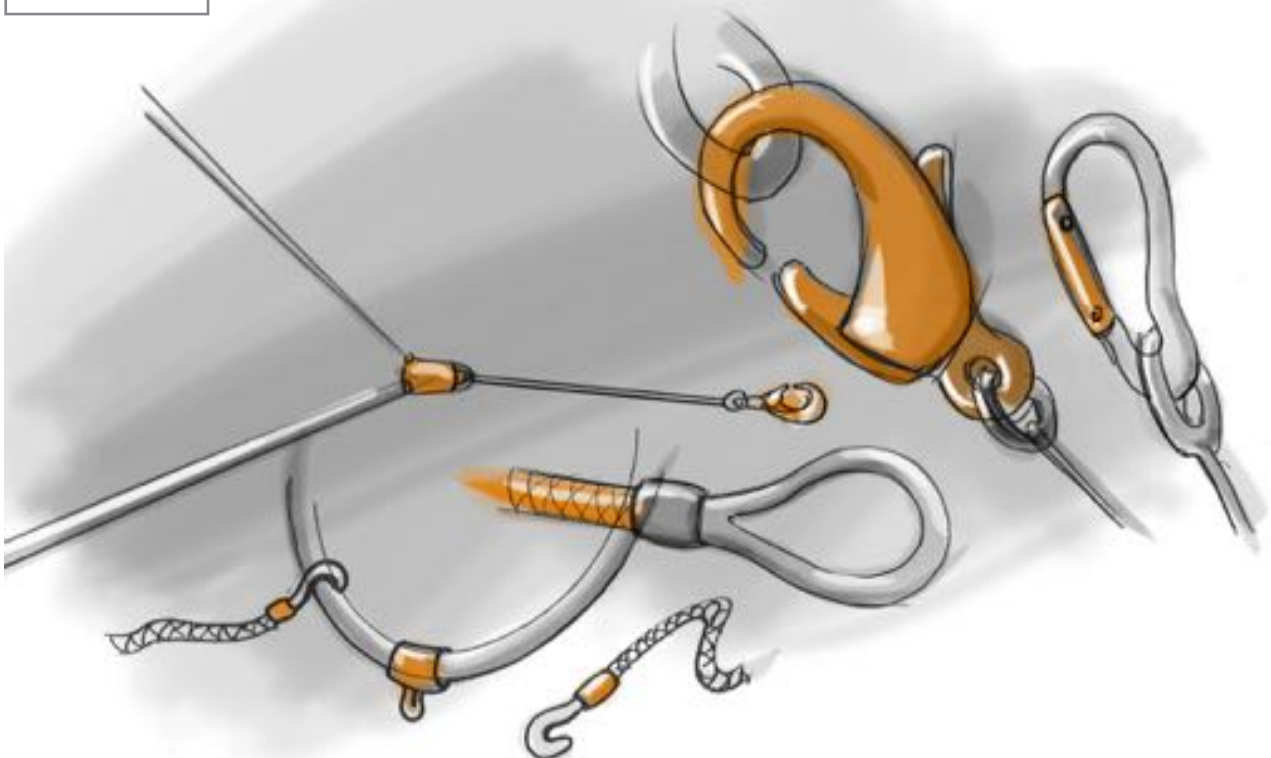
RUBBER



SUCTION PADS

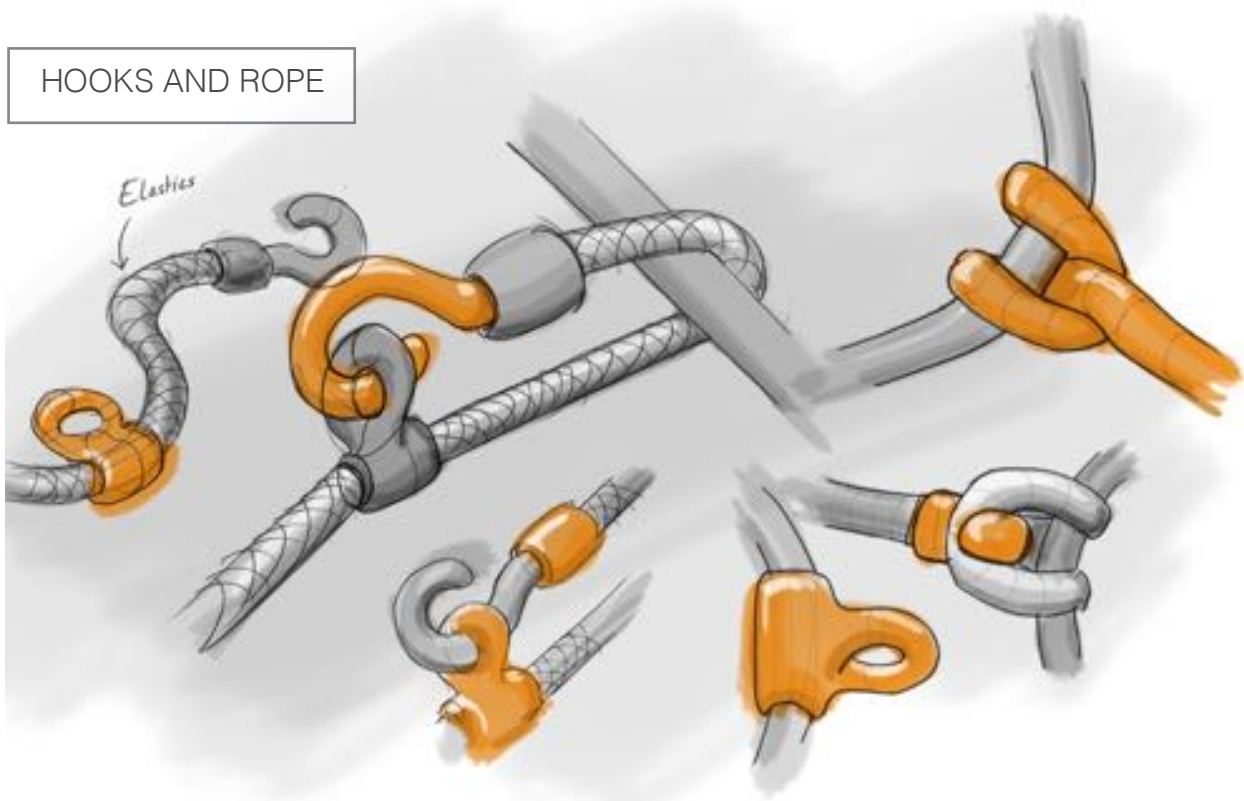


CLIPS



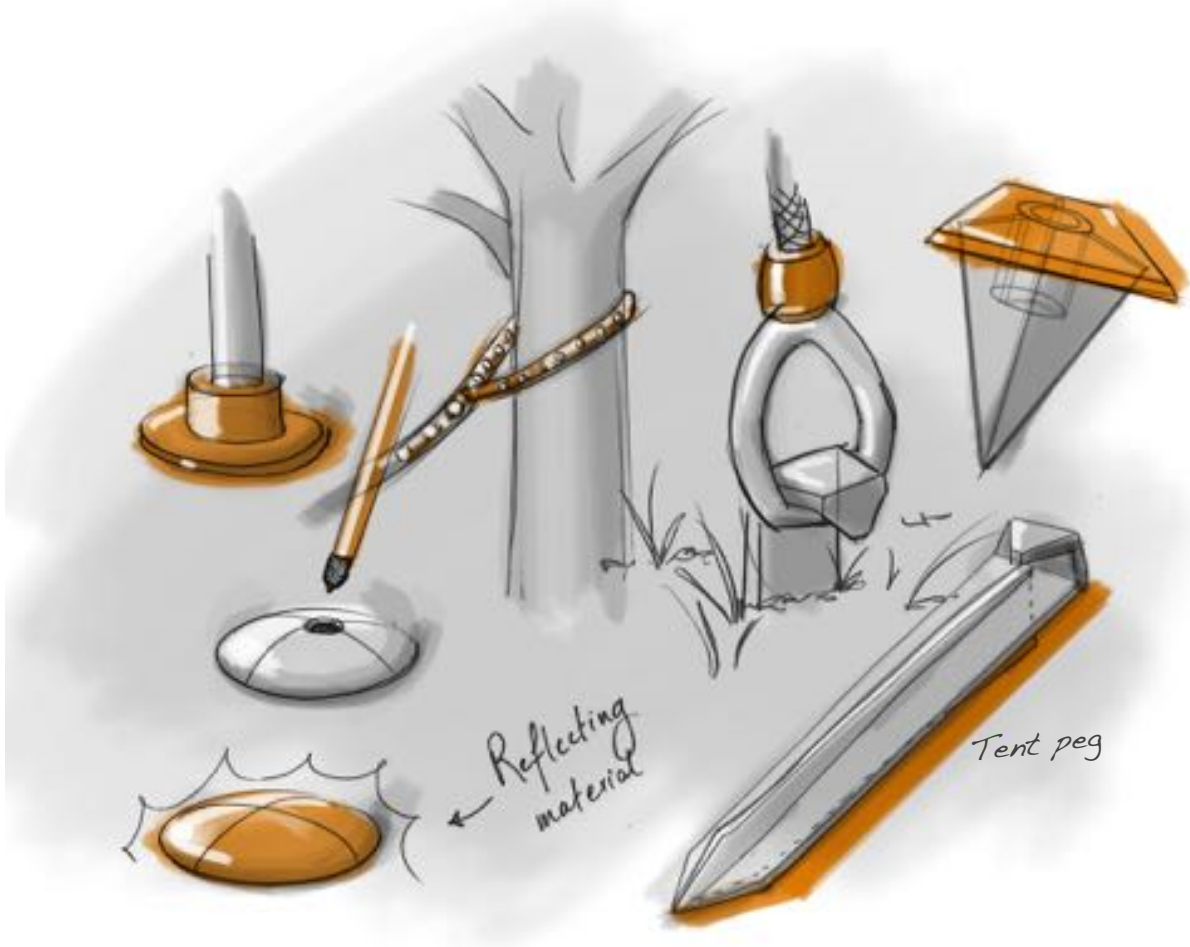


## HOOKS AND ROPE

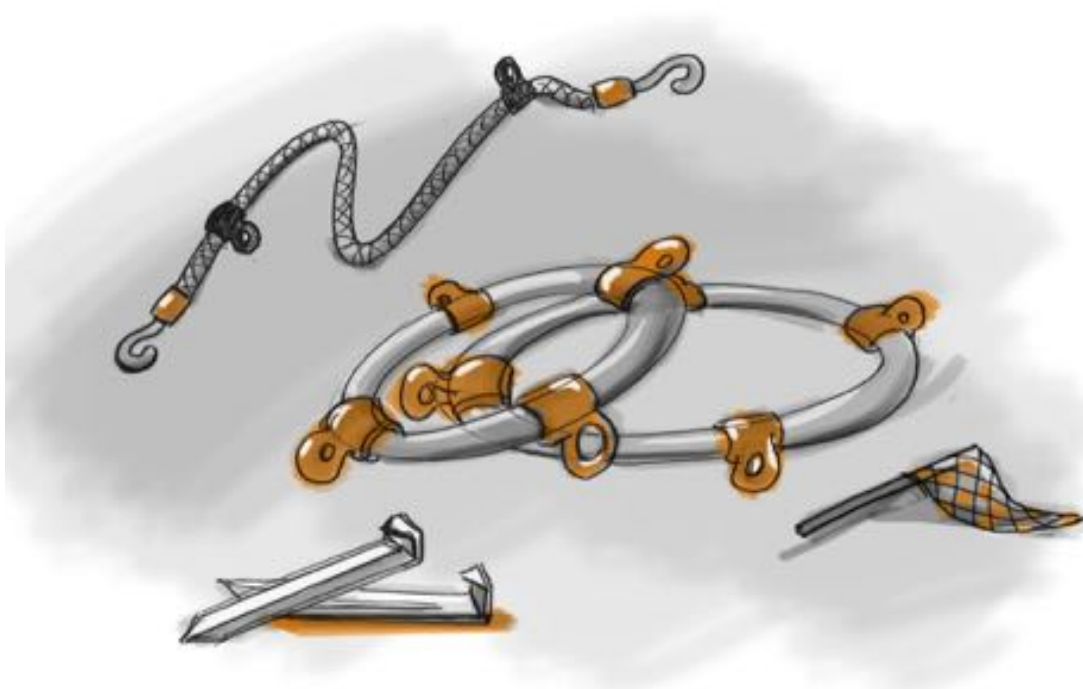


System	PROS	CONS
Pressure clip	<ul style="list-style-type: none"> <li>- Quick and easy</li> <li>- Sturdy</li> </ul>	<ul style="list-style-type: none"> <li>- Not adjustable (need pole)</li> </ul>
Velcro	<ul style="list-style-type: none"> <li>- Adjustable</li> <li>- Easy</li> <li>- Indoor &amp; outdoor</li> </ul>	<ul style="list-style-type: none"> <li>- Not for stiff suspension</li> <li>- Need object to attach to</li> <li>- May wear off</li> </ul>
Rubber	<ul style="list-style-type: none"> <li>- Adjustable</li> <li>- Easy</li> <li>- Indoor &amp; outdoor</li> </ul>	<ul style="list-style-type: none"> <li>- Not for stiff suspension</li> <li>- Need object to attach to</li> </ul>
Suction Pad	<ul style="list-style-type: none"> <li>- Quick and easy</li> </ul>	<ul style="list-style-type: none"> <li>- Need object to attach to</li> <li>- Need the right surface</li> <li>- Not for outdoor</li> </ul>
Clips	<ul style="list-style-type: none"> <li>- Quick and easy</li> <li>- Adjustable</li> <li>- Indoor &amp; outdoor</li> </ul>	<ul style="list-style-type: none"> <li>- Need object to attach to</li> <li>- Not for stiff suspension</li> </ul>
Hooks	<ul style="list-style-type: none"> <li>- Quick and easy</li> <li>- Adjustable</li> <li>- Indoor &amp; outdoor</li> <li>- Very child-friendly</li> </ul>	<ul style="list-style-type: none"> <li>- Need object to attach to</li> <li>- Not for stiff suspension</li> </ul>
Rope	<ul style="list-style-type: none"> <li>- Adjustable</li> <li>- Lightweight</li> <li>- Indoor &amp; outdoor</li> </ul>	<ul style="list-style-type: none"> <li>- Need object to attach to</li> <li>- Not for stiff suspension</li> </ul>

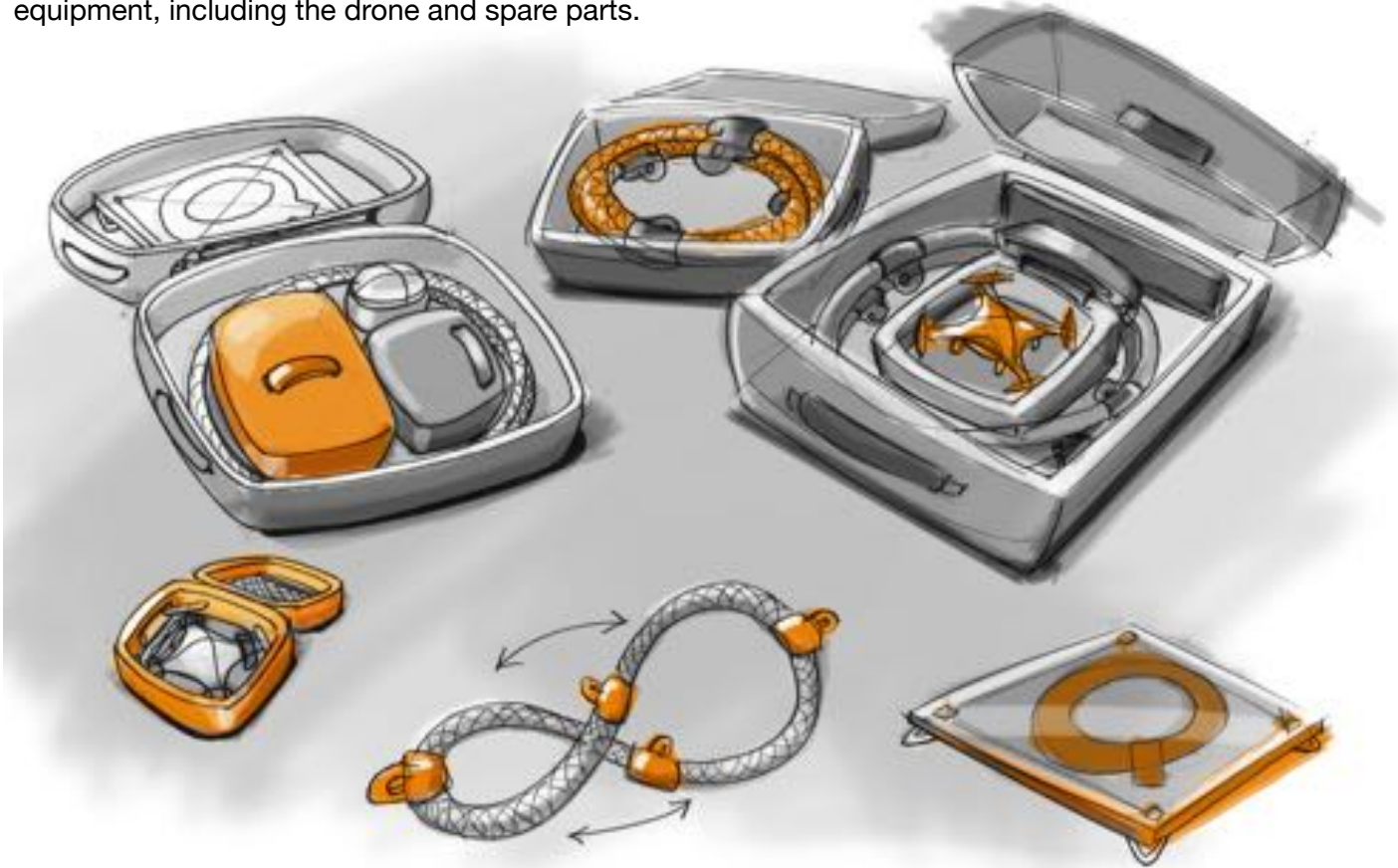
I choose hooks to be the best option out of the seven. With the rings attached to the cord, it can be attached to objects in many ways. It is the most lightweight easily storable option and very easy to use. It does not need explanation, is unlikely to break and can be made from most materials. For connecting the hook to the ground, tent pegs can be used.



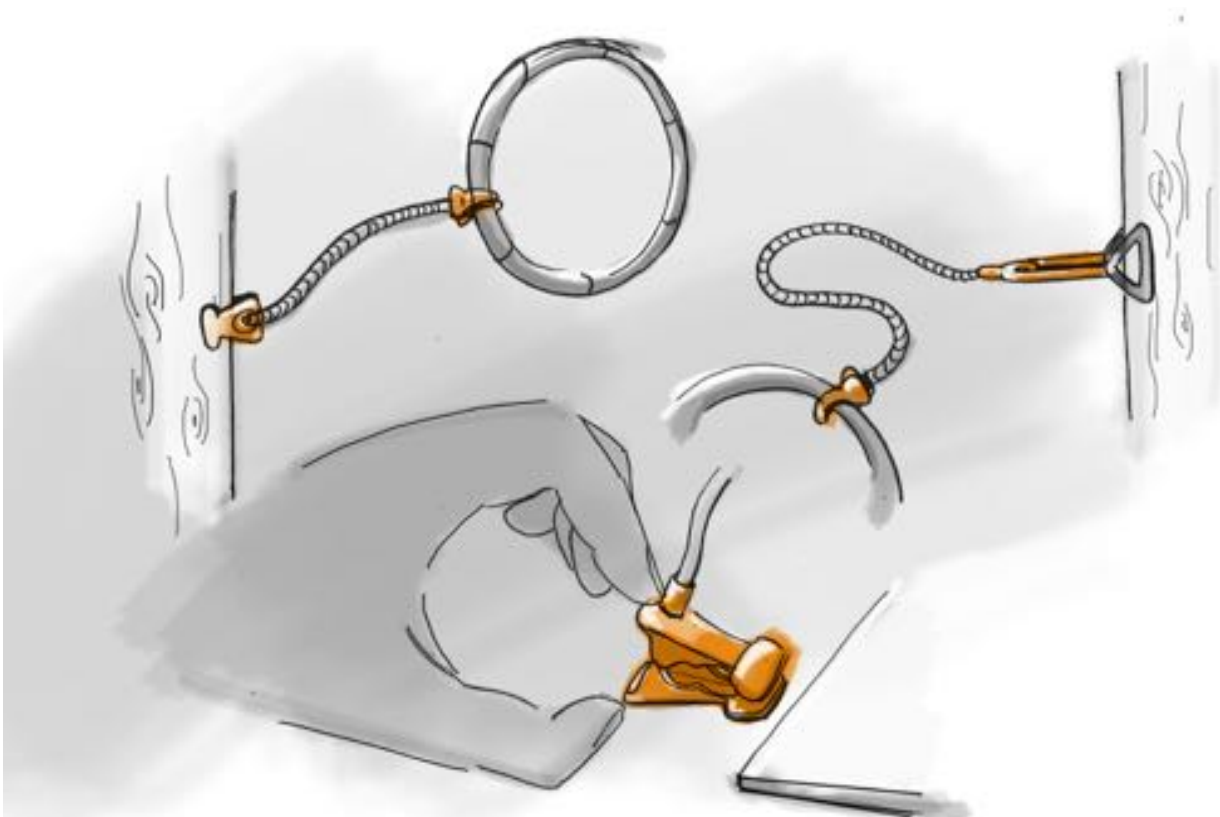
A whole racing game package could include ropes with hooks, hoops, a finish flag and a tent peg for connecting it to the ground



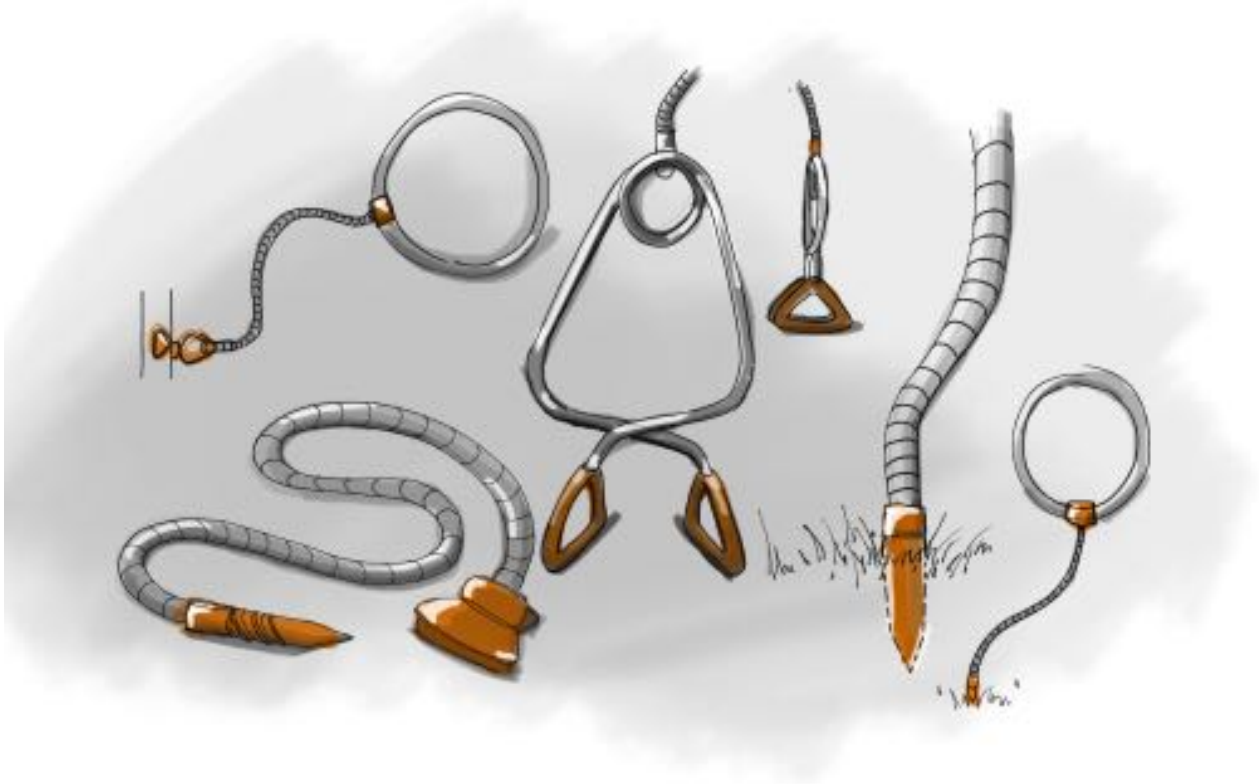
Finally, kitting everything in a package is convenient, looks high end and provides the whole experience. A great idea would be to make the box modular in order to conveniently store all equipment, including the drone and spare parts.



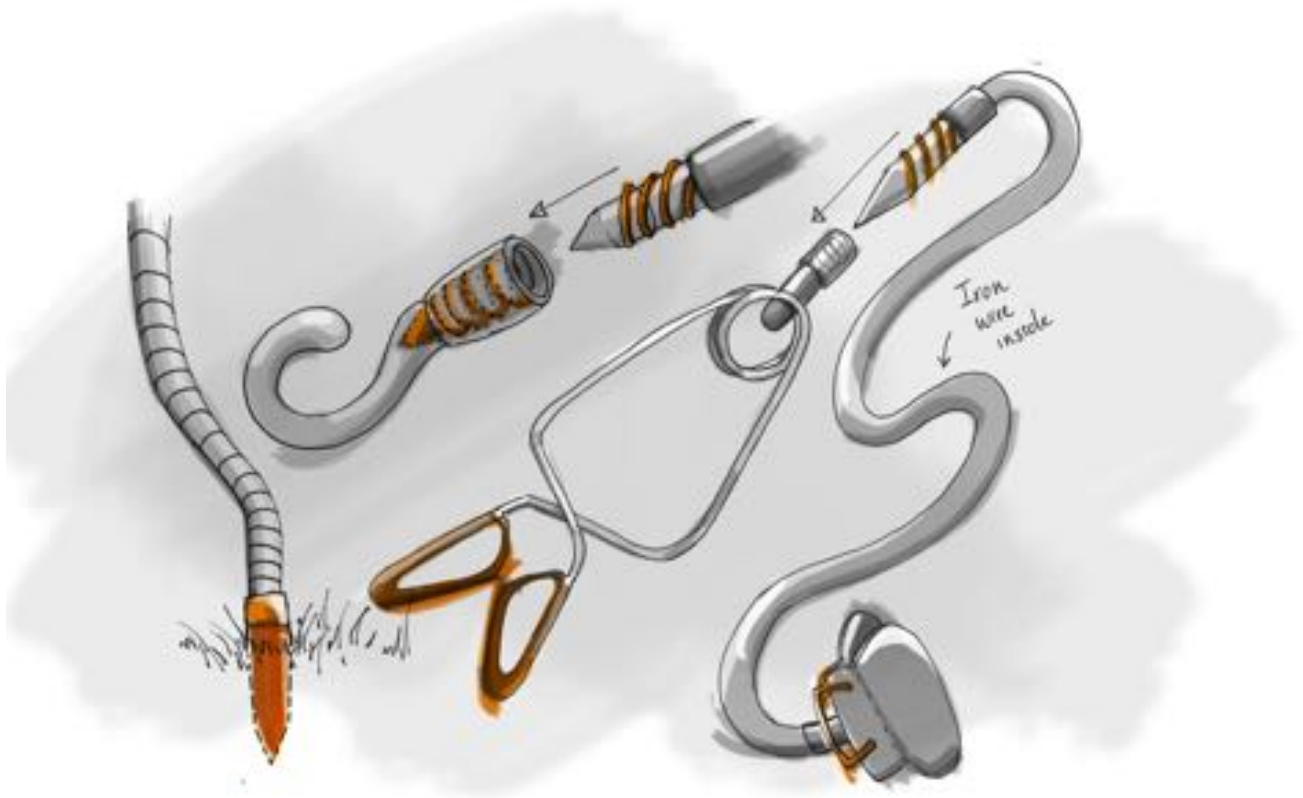
The concept does meet all requirements, and can be used indoor as well as outdoor, but the straps with hooks are not convenient for spaces where there is no hanging opportunity from a ceiling. However, there is an easy solution for this: Instead of a standard rope, a rope with ironwire should be used. This way the hoop can be hung from any angle.



Either the entire rope can be made from bendable iron, or the inside is iron and the outer layer rope. Either way, it can now be attached to clipping systems, or to pins, and be strong enough to hold the weight of the hoop. A pin at the ending is great for outdoor use. A clip for both indoor and outdoor.



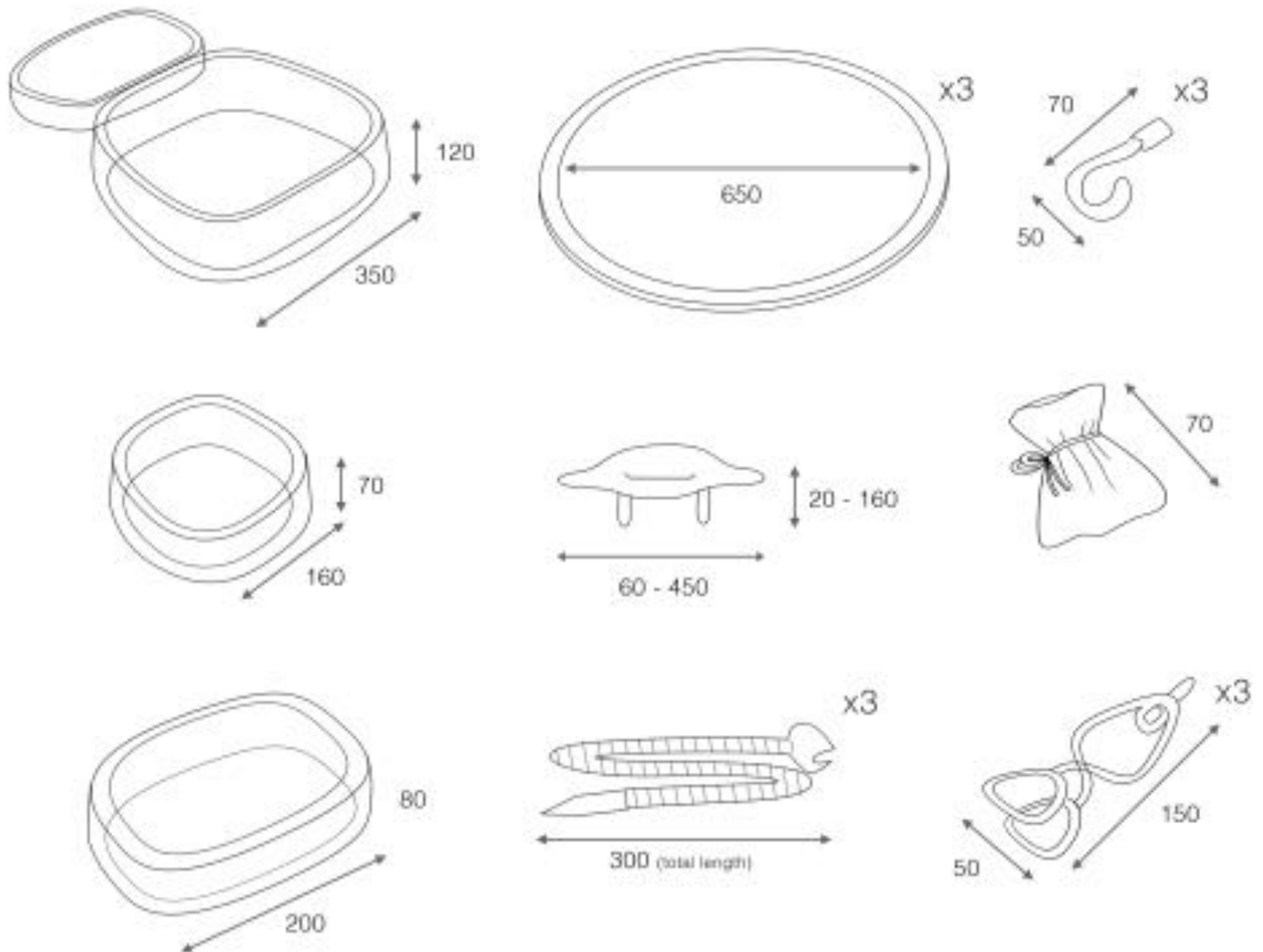
The pin could also be attached to a clipping system. This way less ropes are necessary and it can be used in any situation.





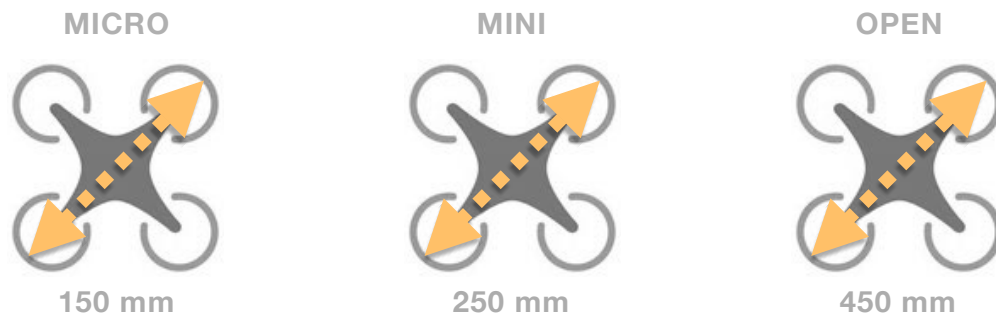
This illustration shows a collection of equipment. At the top left is a square metal plate with a circular hole in the center. To its right is a coiled rope. Further right is a small box with three numbered labels (1, 2, 3) attached to it. Below these are two long ropes with handles. At the bottom left is a small box with a handle. At the bottom right is another square metal plate with a circular hole in the center.

After having taken a quick look at the sizes appropriate for the racing package, I made an illustration of sizes. Numbers are an indication based on research [from appendix...](#) The package should include: A large case with the hoops (hoops can be folded once to fit the case), Smaller cases to contain 3 hooks, 3 clips, a drone (sized between 60 - 160 mm) and 3 'stiff ropes'.

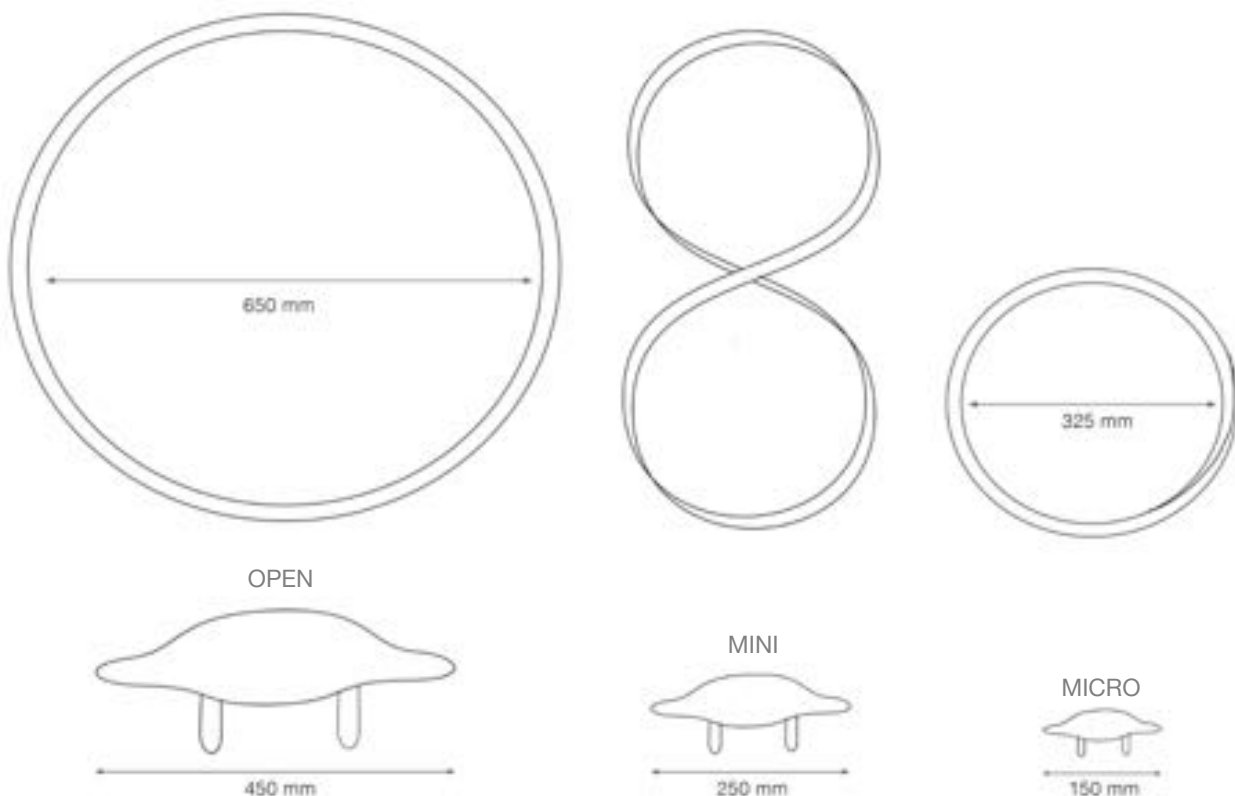


Drones sized larger than 160 mm will be too big to include in the kit. A second and larger kit could later be designed for large drones. The inner-case for a small drone could be used for saving the extra batteries and propellers/propguards of the large drone.

From appendix ... can be concluded that most popular hobby drones, appropriate for (unprofessional) racing, are between 60 and 550 mm. Around 250 - 450 mm wingspan are some drones that have first person view. Drones with fpv are fun for racing with. The drones with an 'X' are too expensive and too fragile for racing with. Some professional racing organisations maintain guidelines concerning drone sizes<sup>1</sup>. An often used guideline divides drones in three groups, micro, mini and open:



These categories will also be used for the drone game. Drones sized up to 250 mm will fit in the racing-case. Larger drones can be raced with, but will not fit in the case. Drones sized between 450 and 500 will be able to fit through the hoops, though this will be a narrow fit. The hoops will have a diameter of 650mm. The OPEN category will have extra space at both sides of +/- 175mm (when looking at frontview instead of wing span), the MINI group will have extra space at both sides of +/- 240 mm, the MICRO group will have an extra space of +/- 275 mm at both sides. For the MICRO group, the hoops may be a bit large. However, since the hoops can be folded, their size can be reduced to a 325mm width.



<sup>1</sup> Hills, D. (2015, March 24). Drone Derby 101: Rules for FPV Racing I Make:. Retrieved June 06, 2016, from <http://makezine.com/2015/03/24/drone-derby/>



In the end, racing for drones is chosen as the final concept, for three reasons:

- It has less of a 'Toy Store' image
- It is fun for all ages
- There is a branding opportunity

Much is yet to be done for realising this concept. More research should go into safety aspects of the accessory, into materials, sizes production and usability. But the main concept is there, and from here on, Red Pimiento is capable of using its own expertise for finalising the concept.



# AMOUNTS, PRICES AND SIZE CATEGORIES

To give an idea of the different groups, Images of each group are shown below. Images are derived from [DronesSpecout.com](https://dronespecout.com)

## DRONES GROUPED BY WING SPAN

Wing span (mm)	Options	Price Range (\$)
<b>30 - 50</b>	11	15 - 70
<b>50 - 70</b>	14	14 - 70
<b>70 - 100</b>	6	15 - 56
<b>100 - 130</b>	20	20 - 230
<b>130 - 160</b>	11	20 - 250
<b>160 - 200</b>	19	20 - 750
<b>200 - 250</b>	32	30 - 1000
<b>250 - 300</b>	13	40 - 700
<b>300 - 350</b>	35	30 - 2000
<b>350 - 400</b>	29	30 - 1000
<b>400 - 450</b>	26	30 - 1800
<b>450 - 500</b>	17	50 - 1600
<b>500 - 550</b>	14	50 - 2000
<b>550 - 600</b>	24	50 - 5800
<b>600 - 650</b>	12	100 - 10 000
<b>650 - 700</b>	5	50 - 2000
<b>700 - 1000</b>	33	50 - 37 000
<b>1000 - 3400</b>	27	2000 - 65 000

## DRONES LARGER GROUPS

Wing span (mm)	Options	Price Range (\$)	Average price (\$)
<b>30 - 100</b>	31	14 - 70	40
<b>100 - 160</b>	31	20 - 250	60
<b>160 - 250</b> (6 items filtered for recreation and hobby use)	46	20 - 500	100
<b>250 - 350</b>	48	20 - 1000	400
<b>350 - 450</b>	55	30 - 1800	600
<b>450 - 550</b>	31	30 - 1800	600
<b>550 - 650</b> (20 items filtered for recreation and hobby use)	16	50 - 4600	700
<b>650 +</b> (61 items filtered for recreation and hobby use)	12	30 - 1800	600

source: [drones.specout.com](https://drones.specout.com)



The wingspan of the drone is measured diagonally, and includes the rotors.

The list above is ordered by drone-size. The size of drones is important for choosing the size of the accompanying accessory. Size does not necessarily make a drone better or worse.

# Examples of drones per size category

30 - 100 MM



Fuqi FQ777-124 Mini



Mota Jetjat Nano C



HJ W609



XinLin X165



JJRC JJ820



Cheerson CX-11



Floureon FX-10 Mini



XK X100



Estes Proto-N

## 100 - 160 MM



Extreme Fliers Micro Drone 3.0



JJRC H6D



HeliMax 1SQ V-Cam



HeliMax 1Si V-Cam



Dromida KODO



Eachine X6



Fayee FY801



JJRC JJ1000



Syma X12S



MJX X901 Mini



Dromida Verso



WLtoys Q272

## 160 - 250 MM



Eachine Assassin 180 FPV



Walkera Furious 320



Parrot Bebop



Blade Vortex 250 Pro



Blade Mach25



eTurbine TB250-2M 5.8G FPV



Cheerson CX-30S



MJX X700c



Cheerson CX-30



Dromida Ominus



Nihui Toys U807



XK X260-B



## 250 - 350 MM



Team BlackSheep Gemini



EHang Ghost 2.0



The ImmersionRC Vortex



Storm Racing Drone (RTF / Type-



Walkera Runner 250 Advance



Xiro Xplorer G



Parrot Airborne Cargo



Dromida Vista UAV



MJX X300C



Eachine H8C Mini



MJX X800



JJRC H21

## 350 - 450 MM



Traxxas Aton



AEE Toruk AP10



Yuneec Typhoon H



AEE AP12



Autel Robotics X-Star 3



JJRC H9D



Mota Giga 6000



JJRC H13C



JJRC H5C



JJRC JJ600A



Tarantula No. 1505



Syma X5SW

## 450 - 550 MM



Flytrex Sky



Ideafly Hero-550



WLtoys V686G



JJRC H8D



SMD Mirage Pro



Splash Drone



HeliMax Form 500



JJRC H11D



JJRC H11C



Mota Pro-Live 4000



HeliMax Voltage 500 3D



XK Aircam X500

## 550 - 650 MM



DJI Inspire 1 Pro



ProDrone Byrd Premium



DJI Phantom 3 4K



ProDrone Byrd Standard



Mota Giga 8000



DJI Matrice 100



ProDrone Byrd Advanced



Cheerson CX-35



JJRC H26D



JJRC H8C



MJX X600



JJRC F182



650 MM +



Ideafly Storm-800



SteadyDrone QU4D X



Allied Drones HornetCam



Lockheed Martin Indago



Aerial Technology



Freefly Systems Alta Hexacopter



Yi Zhan X6 Quadcopter



Swann Gravity Pursuit



DJI Matrice 100



MJX X101



Syma X6



DJI Matrice 600

# BESTSELLING HOBBY DRONES ON AMAZON

★ = with first person view

✗ = inappropriate for racing

1. 450	2. 60	3. 470	4. 590	5. 450	6. 450
★ SYMA X5C Explorers 2.4G 4CH 6-Axis Gy... ★★★★☆ (4,448) \$43.47 37 new from \$37.45	★★★★☆ (1,264) \$11.19 66 new from \$11.19	★ *Latest UDI 818A HD+ RC Quadcopter Dr... ★★★★☆ (808) \$87.99 3 new from \$85.00	✗ DJI Phantom 3 Standard Quadcopter Dro... ★★★★☆ (445) \$487.49 97 used & new from \$418.00	★★★★☆ (355) \$50.98 4 new from \$49.00	★ Syma X5SW 4 Channel Remote Controlled... ★★★★☆ (220) \$66.99 14 new from \$59.94
7. 470	8. 150	9. 60	10. 450	11. 300	12. 170
★ UDI U818A 2.4GHz 4 CH 6 Axis Gyro RC... ★★★★☆ (3,616) \$58.27 33 used & new from \$39.99	★ Hubsan X4 (H107C) 4 Channel 2.4GHz RC... ★★★★☆ (924) \$37.70 33 used & new from \$30.91	★★★★☆ (943) \$31.34 25 used & new from \$31.34	★ Cheerwing Syma X5SW FPV 2.4GHz 4CH 6-... ★★★★☆ (190) \$50.98 7 used & new from \$47.18	★ DBPOWER UDI U845 WIFI FPV UFO Quadcop... ★★★★☆ (61) 1 new from \$105.99	★★★★☆ (1,208) \$39.99
13. 470	14. 450	15. 590	16. 590	17. 60	18. 430
★ DBPOWER U818A WIFI FPV RC Quadcopter... ★★★★☆ (73) \$139.99 3 new from \$139.99	★ Kolibri Discovery Delta-Recon WIFI UB... ★★★★☆ (36) \$139.99 2 new from \$139.99	✗ DJI Phantom 3 Advanced Quadcopter Dro... ★★★★☆ (447) \$738.89 108 used & new from \$630.00	✗ DJI Phantom 3 Professional Quadcopter... ★★★★☆ (640) \$817.99 115 used & new from \$770.00	★★★★☆ (300) \$12.88 55 new from \$11.88	★ Holy Stone F181 RC Quadcopter Drone w... ★★★★☆ (663) \$99.99 12 used & new from \$79.99
19. 60	20. 430	21. 530	22. -	23. 500	24. 150
★★★★☆ (327) \$12.99 69 new from \$2.99	★ Syma Toys X5C-1 Explorers 4 CH Remote... ★★★★☆ (359) \$48.37 16 new from \$46.99	★★★★☆ (229) \$69.95	★★★★☆ (4) \$18.99	★★★★☆ (577) \$129.49	★★★★☆ (473) \$36.60 29 used & new from \$24.99
25. 420	26. 100	27. 260	28. 200	29. 250	30. 180
★ DBPOWER MUX X450W FPV RC Quadcopter D... ★★★★☆ (82) \$68.99 2 new from \$68.99	★★★★☆ (267) \$17.50 22 used & new from \$17.50	★ Eachine H8C Quadcopter With 2.0MP HD... ★★★★☆ (160) \$34.99 7 new from \$30.08	★★★★☆ (23) \$53.99 2 new from \$53.99	★ RC Stunt Drone Quadcopter w/ 360 Flip... ★★★★☆ (144) \$49.80 2 used & new from \$49.00	★ Holy Stone F180C Mini RC Quadcopter D... ★★★★☆ (844) \$59.99 6 used & new from \$39.99

## AMOUNT PER CATEGORY

60 - 160:	7	351 - 450:	7
161 - 250:	5	451 - 550:	4
251 - 350:	2		

APPENDIX

RED PIMIENTO TO CONSUMER

## [General info]

## 1. Product clarification

Z



## Backpack for drones

- Backpack with separate compartment for drones
- Based on Prowell DC21948

Projectname	Backpack for drones	Designer	Mendel
DateCreated	15-07-2016	Brand	Red Pimiento
Description	Backpack for drones and drone equipment	Quantity	500, 1K, 2K, 5K, 10K

## [General info]

## 2. Materials

	Name	code	file name
[a]	grey main outside material	413 - 2	
[b]	dark pattern	437 - A1	
[c]	Black webbing	Standard black 1 inch webbing	
[d]	Dark grey mesh	Mesh from side pocket of the Nikon DSLR Compact Backpack	
[e]	Grey non-elastic mesh	<i>Pantone</i> Uncoated: 428 U (RGB) 428 UP (CMYK)	
[f]	Greenblue waterresistant fabric (the drone fabric) with TPU coating	97 - 45	



Projectname	Backpack for drones	Designer	Mendel
DateCreated	15-07-2016	Brand	Red Pimiento
Description	Backpack for drones and drone equipment	Quantity	500, 1K, 2K, 5K, 10K

## [General info]

## 2. Materials

	Name	code	file name
[g]	Lightgrey velvet	<i>Pantone</i> Uncoated: 429 U (RGB) 429 UP (CMYK)	
[h]	Darkgrey velvet	<i>Pantone</i> Uncoated: 433 U (RGB) 433UP (CMYK)	
[i]	Grey inner material	77 - 26	
[j]	Greenblue velvet	<i>Pantone</i> Coated: 3145 C (RGB) 3145 CP (CMYK) Uncoated: 3145 U (RGB) 3145 UP (CMYK)	
[k]	Polyester material (because polyester is an affordable flame retardant material)	100% plain polyester fabric. Colour: Black	

Projectname	Backpack for drones	Designer	Mendel
DateCreated	15-07-2016	Brand	Red Pimiento
Description	Backpack for drones and drone equipment	Quantity	500, 1K, 2K, 5K, 10K

## [General info]

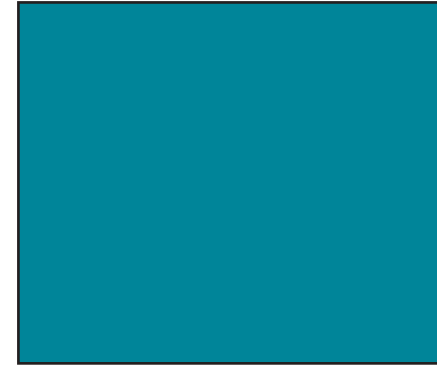
## 2. Materials

All the blue colours, stiches and rims are colour:

***Pantone***

Coated: 3145 C (RGB)  
3145 CP (CMYK)

Uncoated: 3145 U (RGB)  
3145 UP (CMYK)



Projectname	Backpack for drones	Designer	Mendel
DateCreated	15-07-2016	Brand	Red Pimiento
Description	Backpack for drones and drone equipment	Quantity	500, 1K, 2K, 5K, 10K

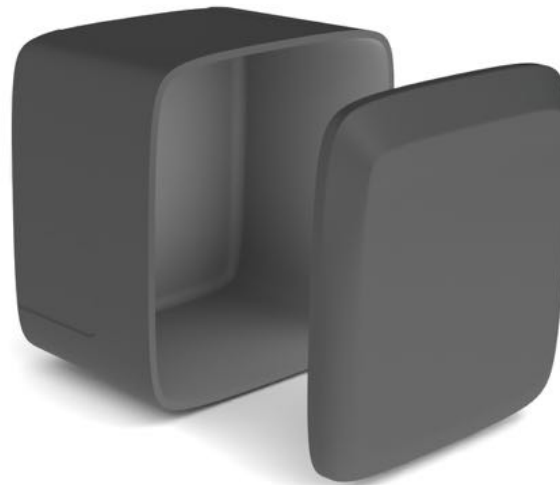
[General info]

## 3. Index page

Three sections are covered in this Production Guideline



A. Backpack



B. EVA-case



C. Assembly

Projectname	Backpack for drones	Designer	Mendel
DateCreated	15-07-2016	Brand	Red Pimiento
Description	Backpack for drones and drone equipment	Quantity	500, 1K, 2K, 5K, 10K

## [ A. Backpack]

## 1. Use Prowell DC21948 bag as a base

### DC21948

- Backpack based on Prowell DC21948 (large)



DC21948



Request





Projectname	Backpack for drones	Designer	Mendel
DateCreated	15-07-2016	Brand	Red Pimiento
Description	Backpack for drones and drone equipment	Quantity	500, 1K, 2K, 5K, 10K

## [ A. Backpack]

### 1. Outside dimensions

#### Bag dimensions

- Start from DC21948, the outer dimensions are the same (excluding an extra zip-pocket on the side of the backpack)
- The EVA-case (page 26) should fit in the backpack.



Projectname	Backpack for drones	Designer	Mendel
DateCreated	15-07-2016	Brand	Red Pimiento
Description	Backpack for drones and drone equipment	Quantity	500, 1K, 2K, 5K, 10K

[ A. Backpack]

## 2. Details - Front

### Zipper, logo & strap

- Remove:
  - Zipper + pocket
  - Logo
  - Tripod strap



## [ A. Backpack]

## 2. Details - Front

## Front

- Make wider: +/- 230 mm



## [ A. Backpack]

## 3. Details - Rightside

## Right side details

1. Remove expansible pocket + zipper at the bottom, to make place for EVA-case
2. Add fabric [b] shaped as shown in image (dimensions next page) & add blue stitching (this is not a pocket)
3. Edit Tripod strap (next page)
4. Add elastic strap & add blue stitching (page 12)
5. Lower pocket and put in the same angle (parallel) of the elastic strap & add blue edge (page 12)





## [ A. Backpack]

## 3. Details - Right side



### Strap with clip

Place strap in middle of texture fabric (same width as original strap (1 inch))

1. Stitch short side in seam + add blue stitching
2. Stitch long side in opposite seam
3. Use blue stitching strap end and elastic strap loop



## [ A. Backpack]

## 3. Details - Rightside



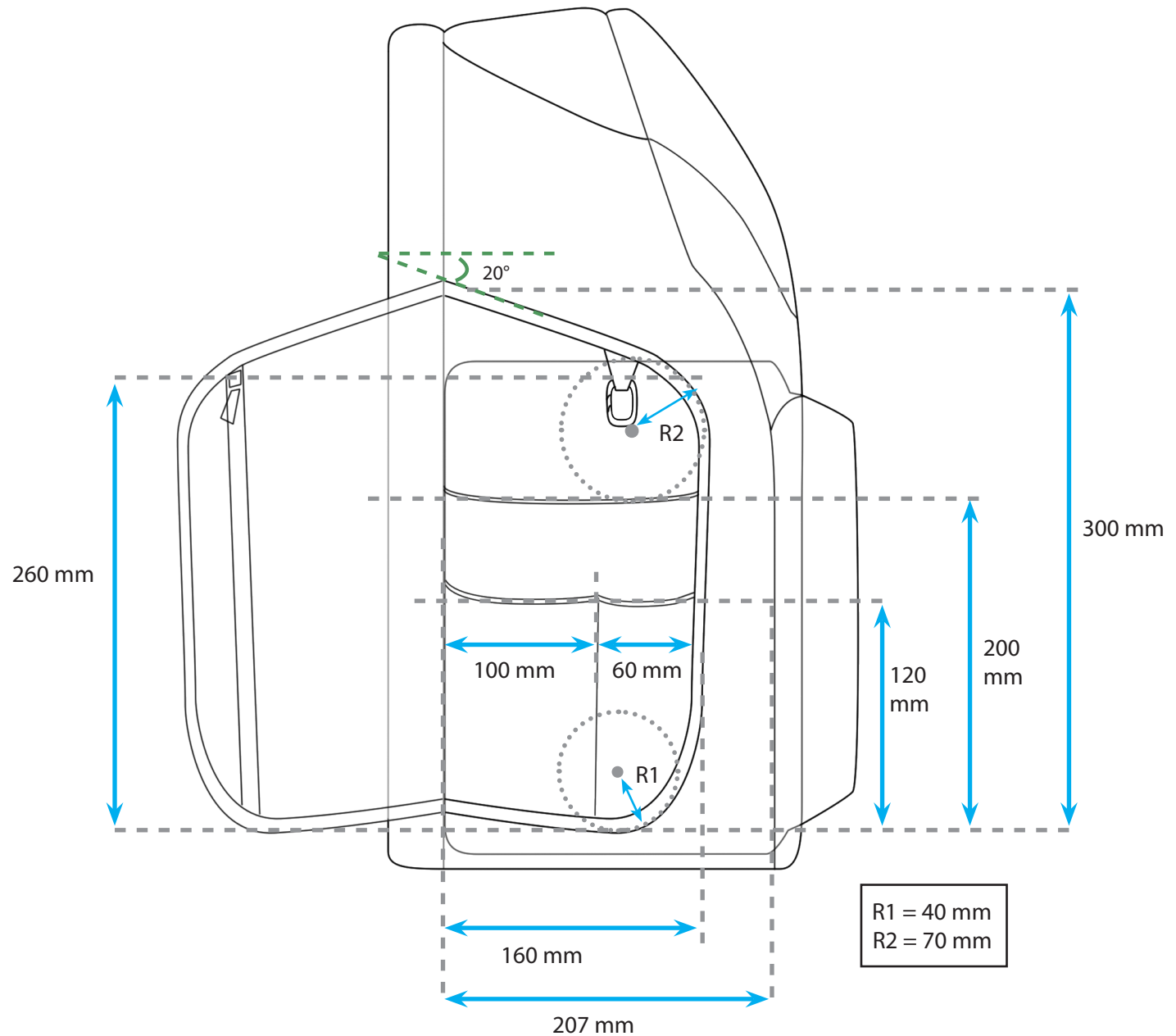
## Pocket and Elastic strap

1. Make elastic pocket lower compared to original backpack
  - Place in the same angle as clip (20°) and use fabric **[d]**
  - Add blue elastic rim tape
2. Add Elastic strap (1 inch/ 25 mm)
  - Place in the same angle as clip and pocket (20°)



## [ A. Backpack]

## 4. Details - Leftside



## Left side

- Add zipper pocket on the left side of bag (specifications next page)
- Use same shape as rightside
- Use black inside-out zipper (for zipping the flap to the backpack)



## [ A. Backpack]

## 4. Details - Leftside

### Inside zipper pocket

Inside material of zipper pockets is [1]

1. Add 3 inner pockets - sizes in previous image, material [f]
2. Add blue rimtape and blue sewing line
3. Add non-elastic mesh inside flap material [e]
4. Use vertical black inside-out zipper & zipper puller
5. Add hanger for keys (HK snap hook )
  - 1 inch wide webbing [c]
  - Blue stitching



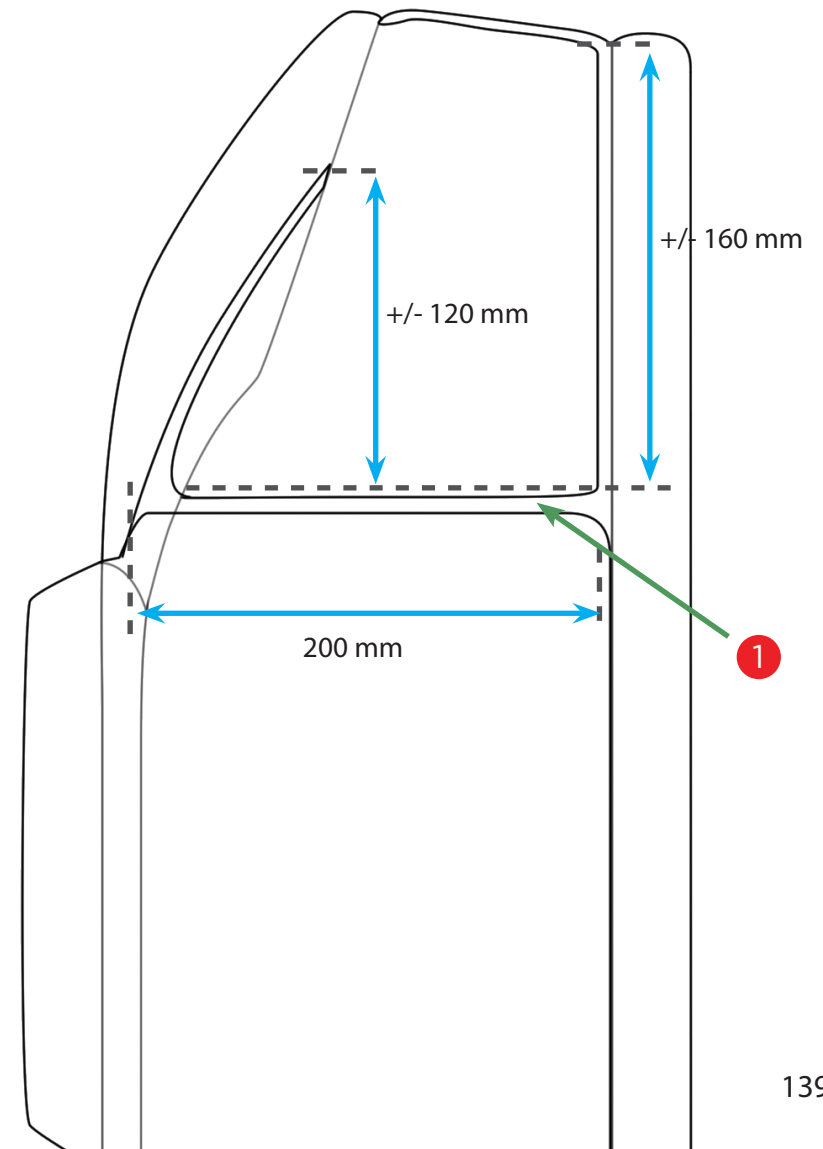
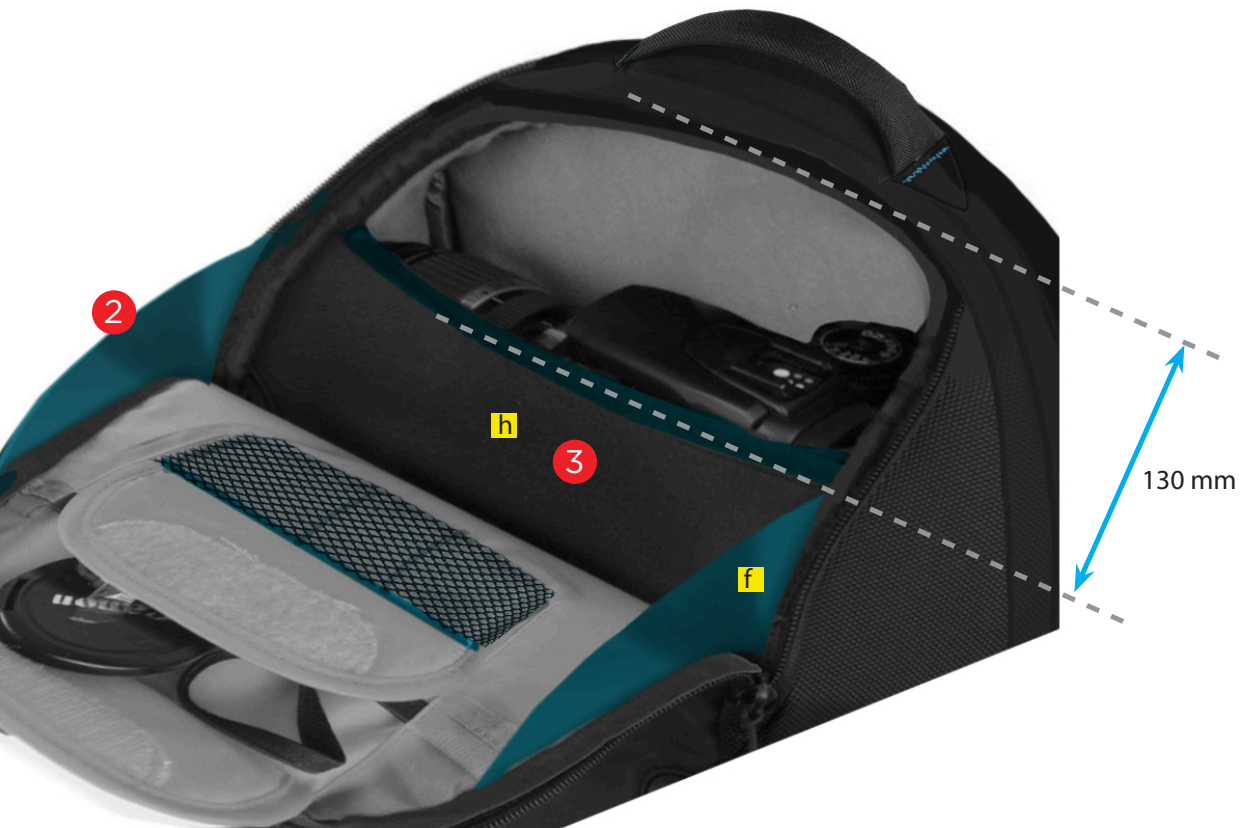


## [ A. Backpack]

## 5. Details - Top compartment

## Top compartment

1. Top compartment and bottom compartment are divided by a (non-removable) padded velvet wall. Material [g], padding thickness 10 mm.
2. Add piece of fabric on both sides of flap, to prevent the flap from completely falling over, material [f]
3. Add soft-wall to prevent objects falling out of the top compartment. Material: velvet [h] with 5mm padding. Add blue rim.  
- Opening should be 130 mm wide

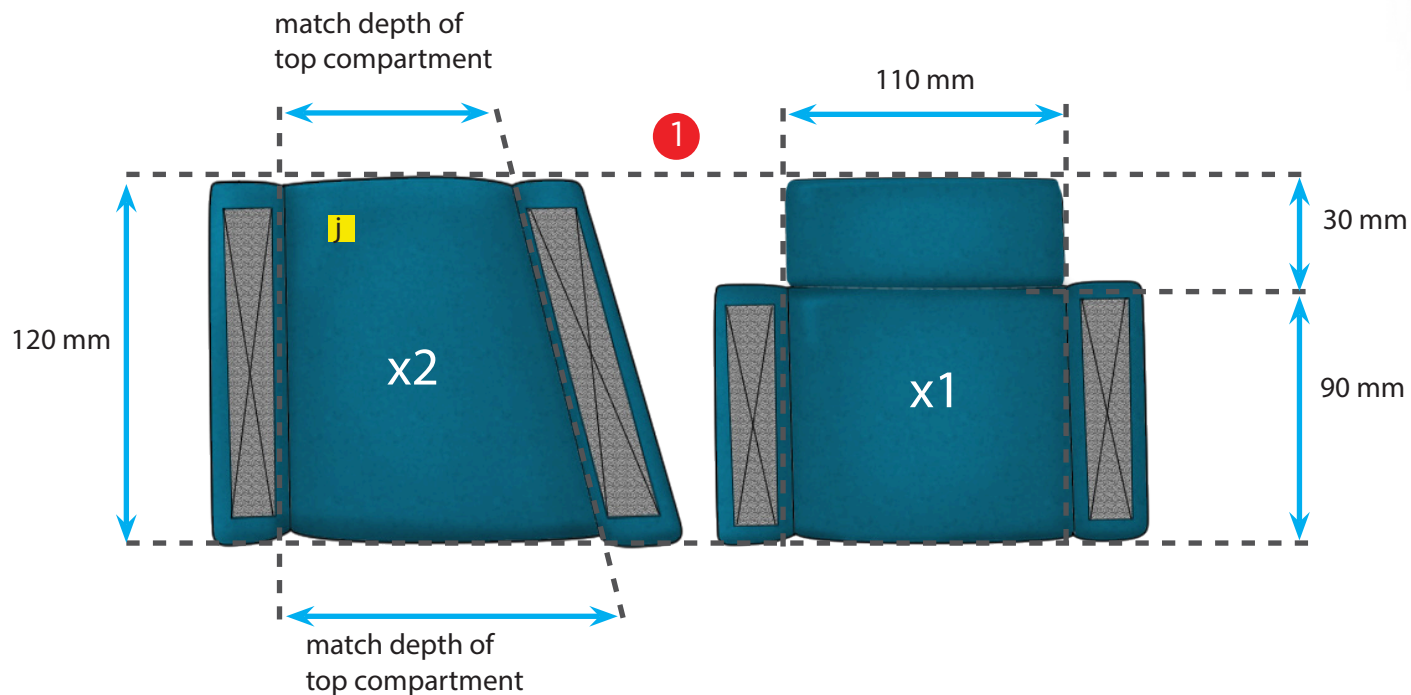


## [ A. Backpack]

## 5. Details - Top compartment

## Dividers top compartment

1. Add dividers (material: **[j]**, 10 mm padding thickness).  
Add 1 inch velcro to sides & match color of velcro to velvet blue).  
- 2x custom shaped, 1x square shaped with flap
2. Match the shape of the 2x custom shaped dividers to inside of compartment.



## [ A. Backpack]

## 5. Details - Top compartment

## Top compartment

1. Use velvet fabric [g] for all inside walls
2. Add pocket inside flap, same as in the Prowell DC21402 backpack, material [g].
3. Add pocket of elastic mesh, material [d]
  - add elastic blue rim
  - divide mesh pocket in 3 smaller pockets





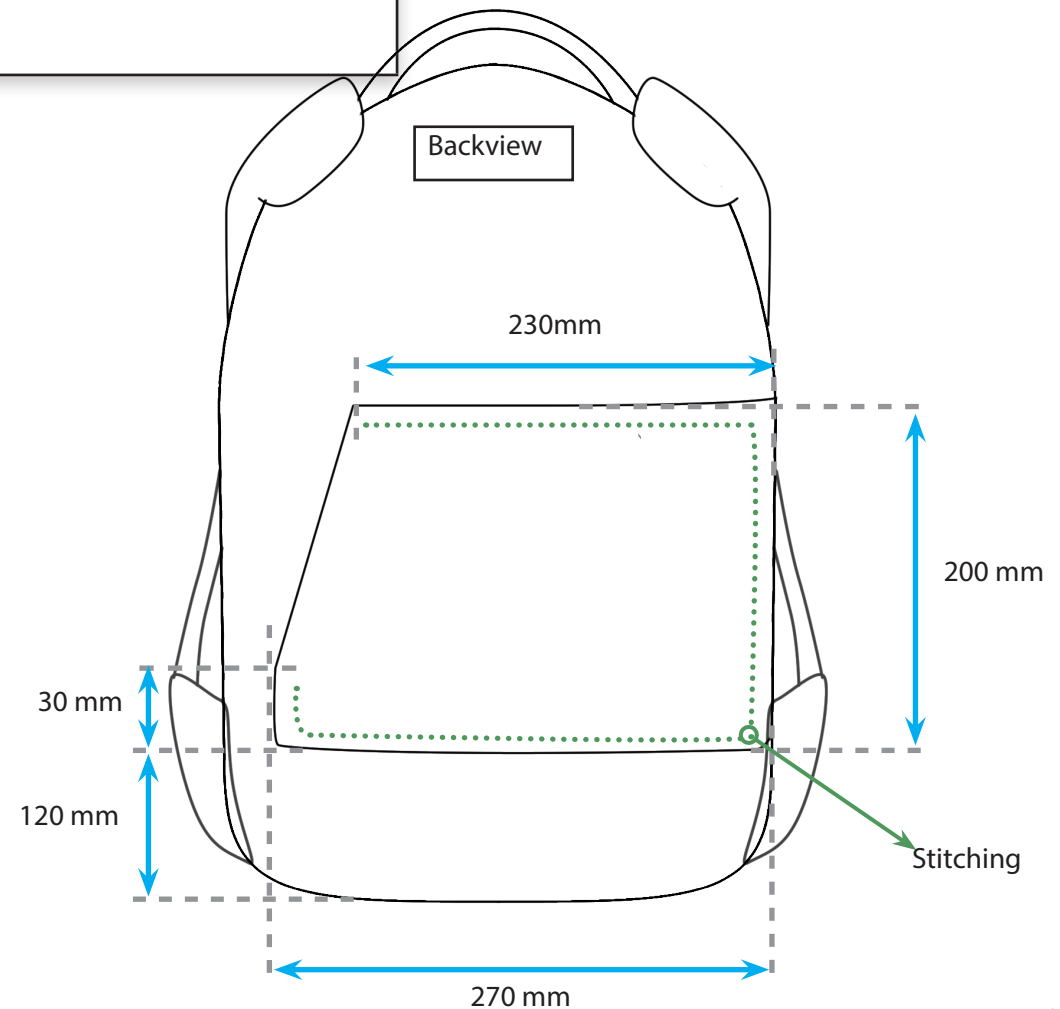
Projectname	Backpack for drones	Designer	Mendel
DateCreated	15-07-2016	Brand	Red Pimiento
Description	Backpack for drones and drone equipment	Quantity	500, 1K, 2K, 5K, 10K

## [ A. Backpack]

## 6. Details - Backside

### Laptop compartment

- Material inside laptop compartment: [g]
- Add pocket for tablet inside laptop compartment. Dimensions as in line drawing. Material: blue velvet [j] with 3 mm padding.





## [ A. Backpack]

## 6. Details - Backside

## Back straps

1. Replace shoulder straps with straps from Prowell DC21775 backpack
2. Change stitching to blue
3. Make top of shoulderstrap of dual material: [a] [b] [a]
4. Add blue stitching

New Drone Backpack



1

3

2

c

c

Prowell DC21775 Backpack

## [ A. Backpack]

## 6. Details - Backside

## Add hipstrap

1. Add hipstrap from Prowell DC21775 backpack
  - Keep same hight, but change length to 110 mm.
  - change material to [a]
2. Match mesh with mesh on side of backpack



Projectname	Backpack for drones	Designer	Mendel
DateCreated	15-07-2016	Brand	Red Pimiento
Description	Backpack for drones and drone equipment	Quantity	500, 1K, 2K, 5K, 10K

[ A. Backpack]

## 7. Details - Rain cover



### Rain cover

- Include Raincover

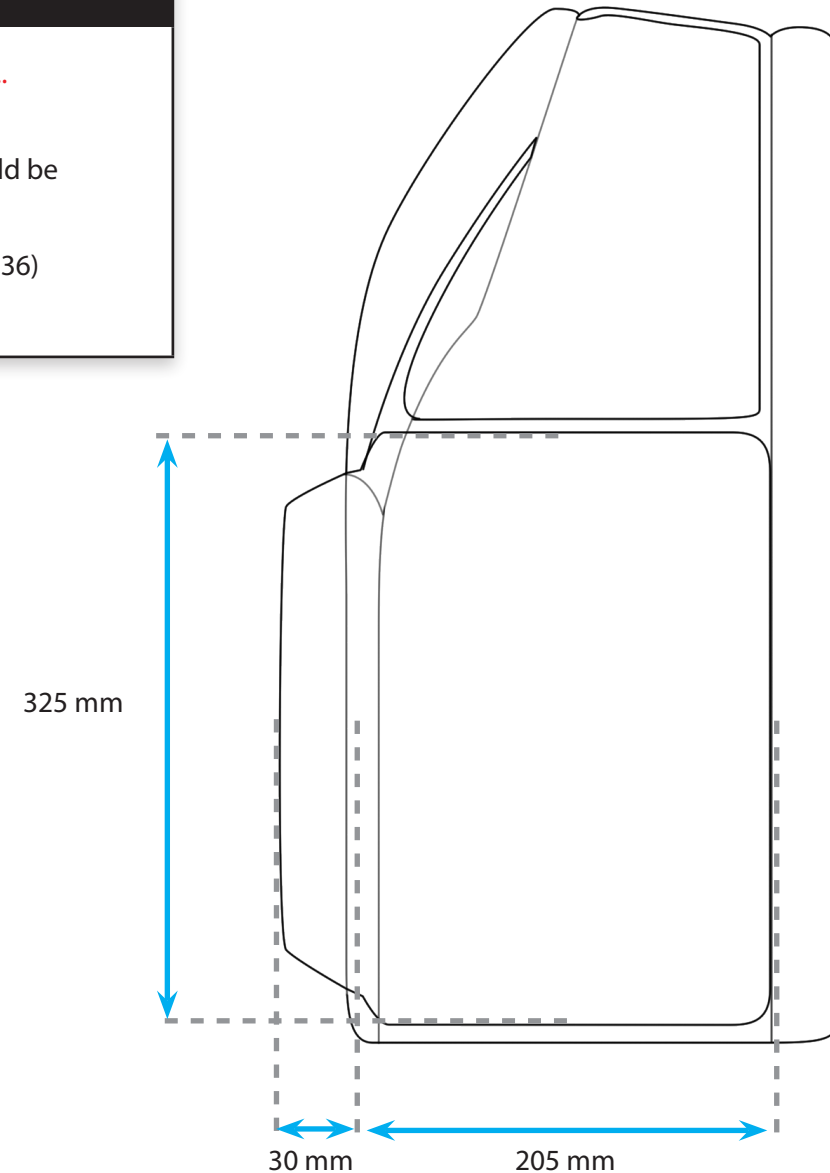


## [ B. EVA-case]

## 1. Details - EVA case

## EVA case compartment

- The lower part of the backpack should accommodate the EVA-case from [file ...](#)
- The EVA-case *can not* be taken out of the backpack.
  - Case base should be inserted into bottom compartment and the edge should be stitched to the edge of the bag opening with zipper (see page 34)
  - Case lid is attached to bag with connecting fabric on bottom side (see page 36)



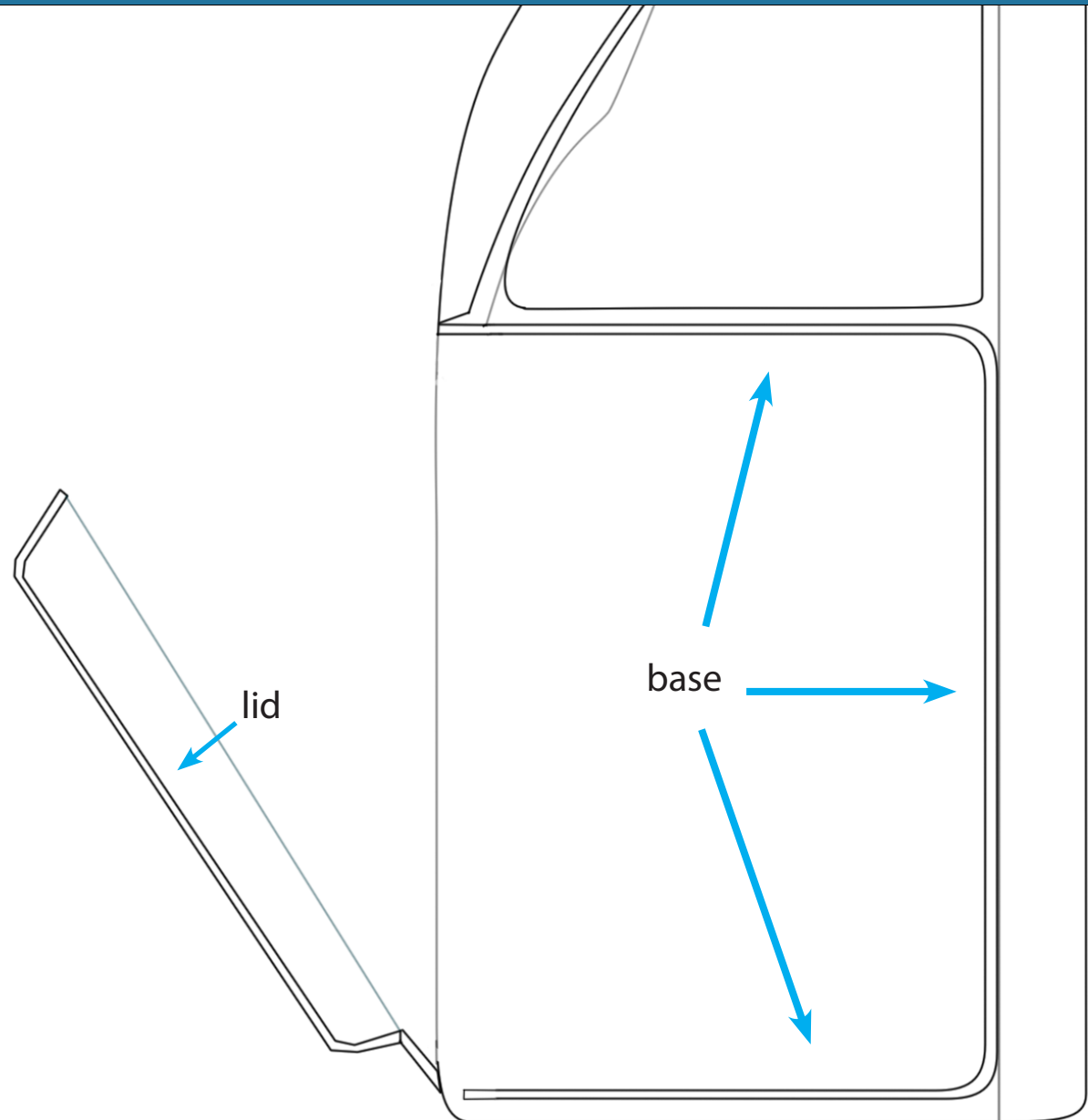


## [ B. EVA-case]

## 1. Details - EVA case

## EVA case: Lid and Base

- Eva-case consists of a lid and a case.
- Lid is attached to backpack on bottomside



## [ B. EVA-case]

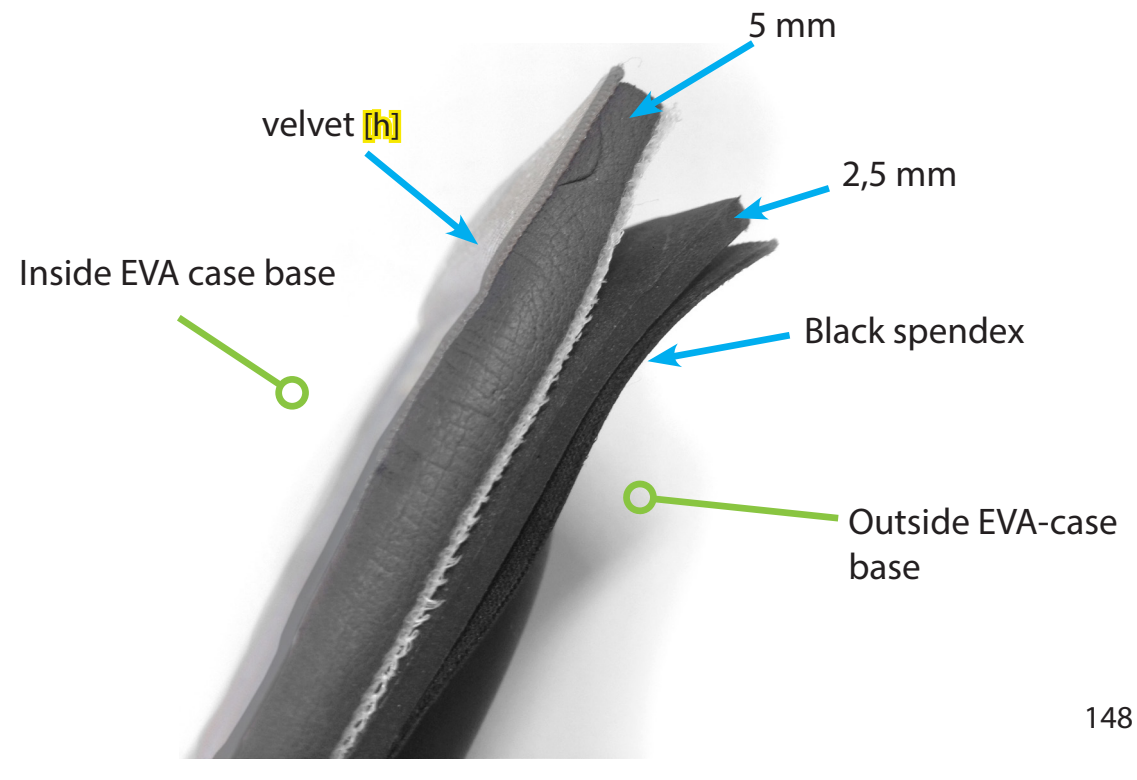
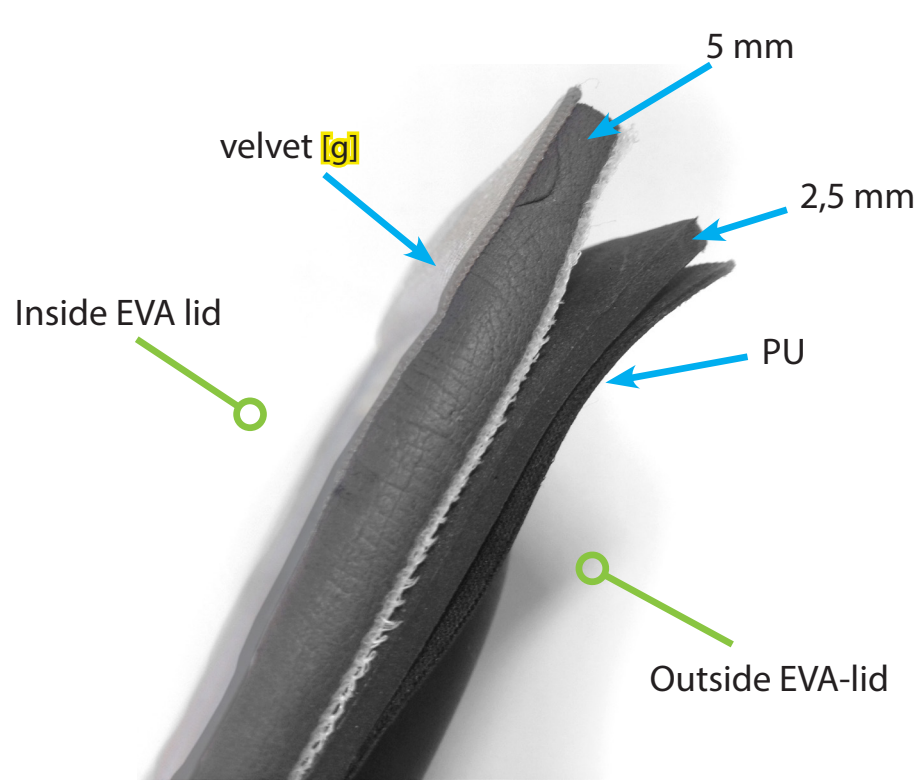
## 1. Details - EVA case

## LID

- The wall of the case LID is made from:
  - on the outside black matte PU
  - a layer of hard 2,5 mm EVA
  - on the inside soft 5 mm EVA
  - light coloured velvet [g]

## BASE

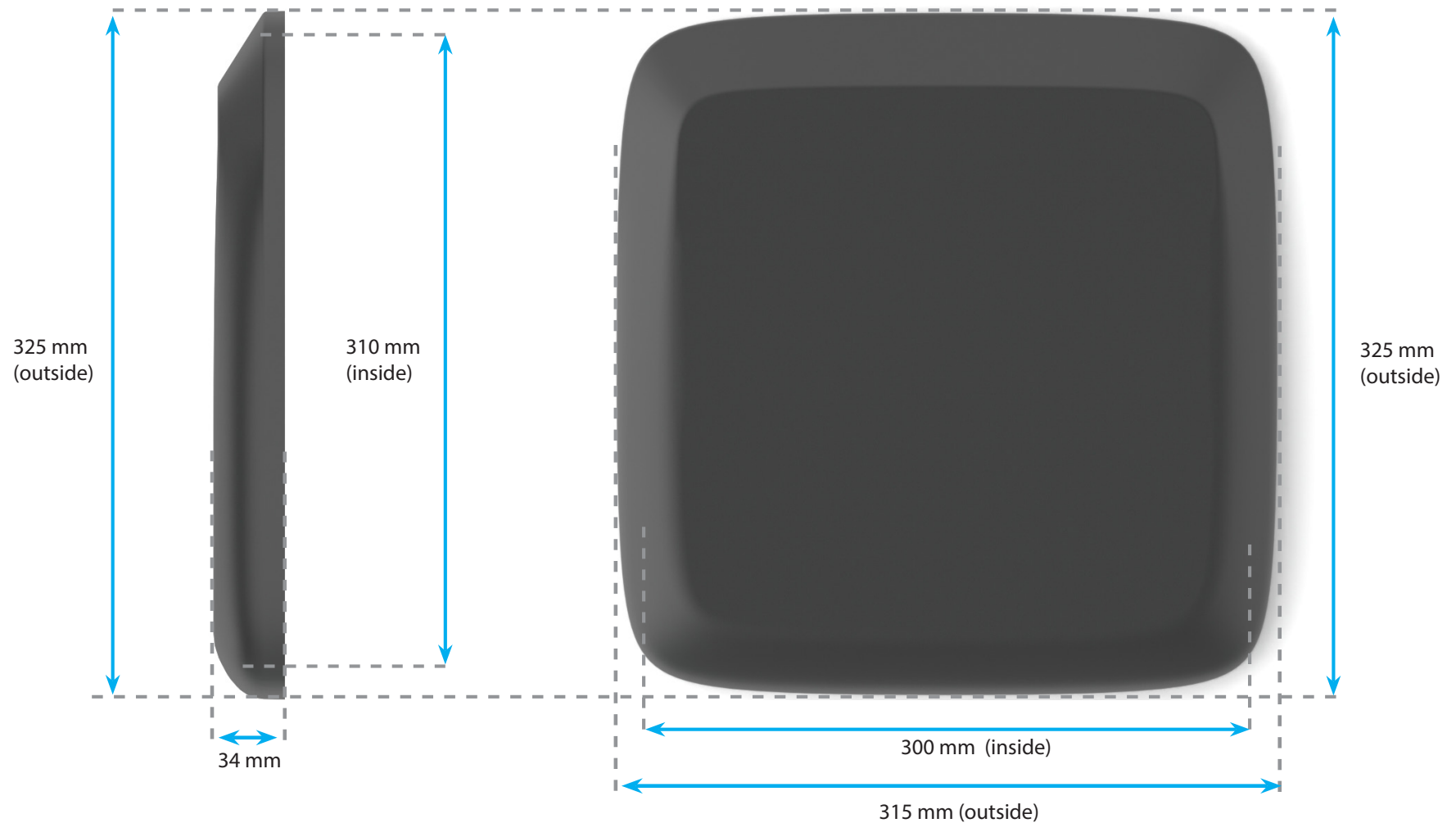
- The wall of the case BASE is made from:
  - on the outside black spendex
  - a layer of hard 2,5 mm EVA
  - on the inside soft 5 mm EVA
  - dark coloured velvet [h]



## [ B. EVA-case]

## 2. Dimensions - EVA lid

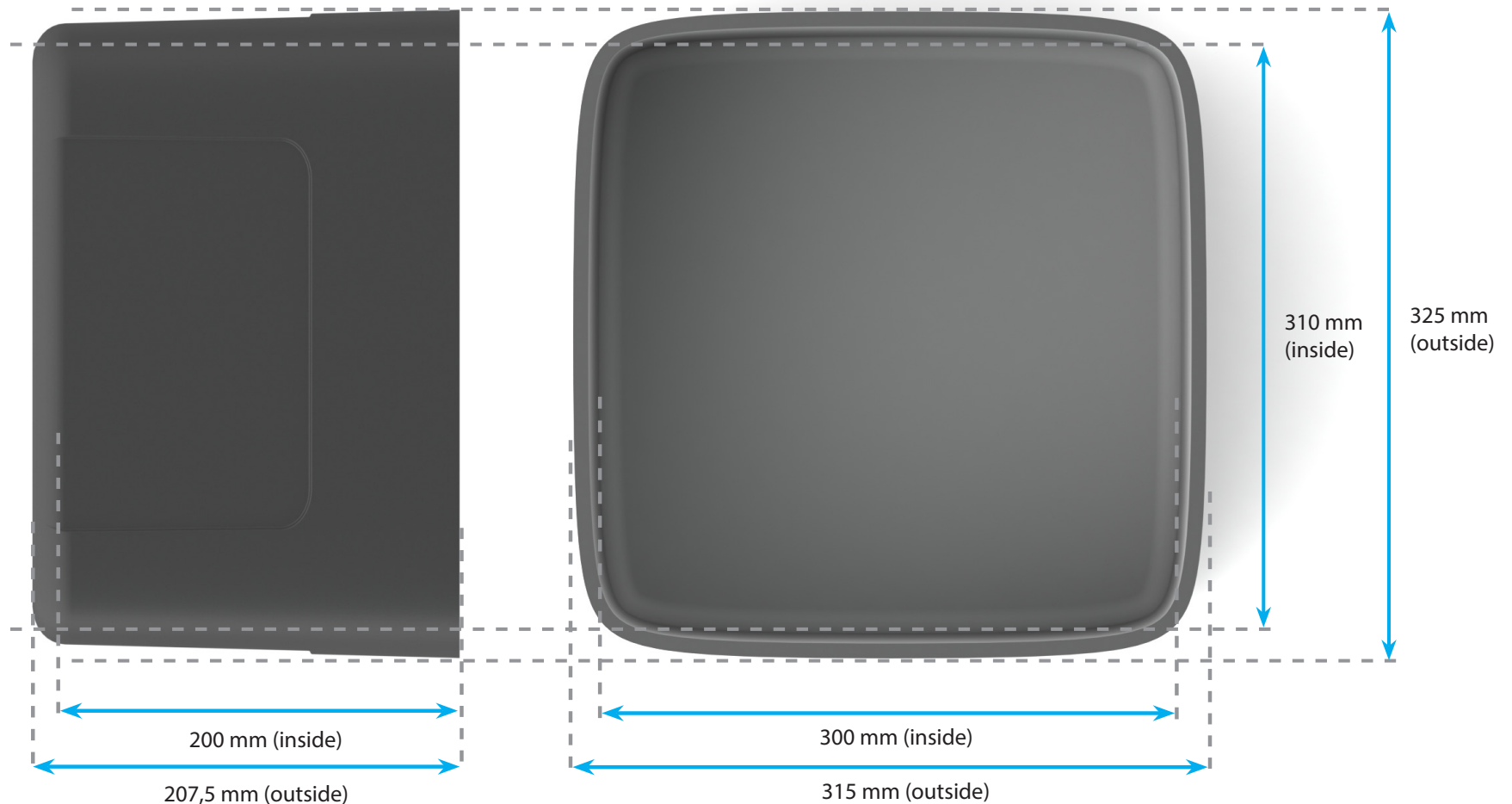
- Filename: ...
- 315 x 325 outer dimensions
- 7.5mm thickness (2.5 hard EVA + 5mm soft EVA padding)
- resulting in 300 x 310 inner dimensions



## [ B. EVA-case]

## 2. Dimensions - EVA base

- Filename ...
- 315 x 325 outer dimensions
- 7.5mm thickness (2.5 hard EVA + 5mm soft EVA padding)
- resulting in 300 x 310 inner dimensions





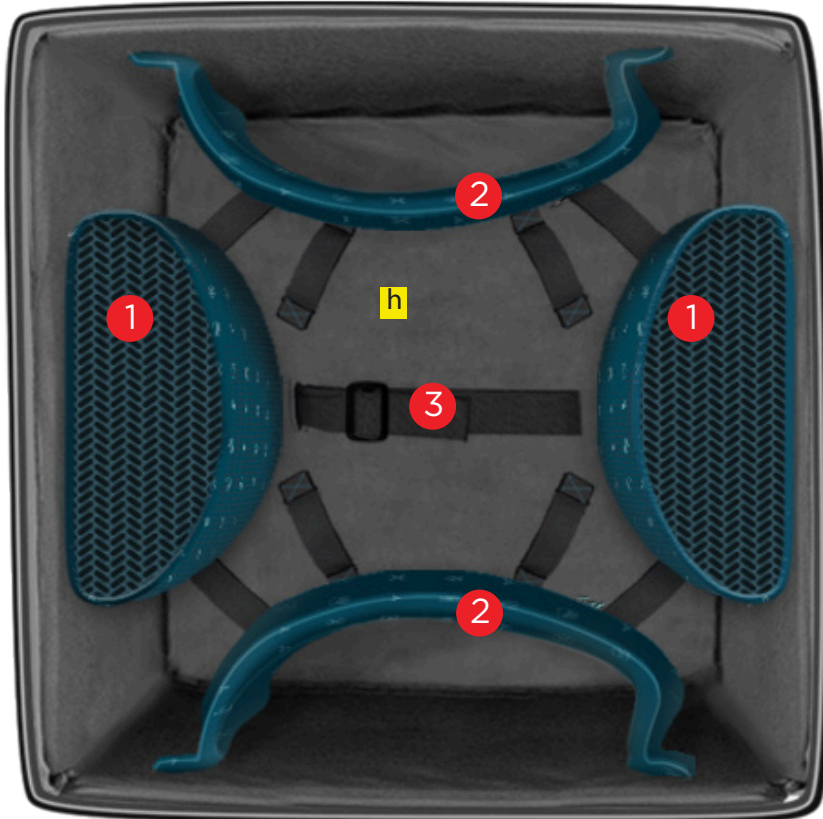
## [ B. EVA-case]

## 3. Details - EVA case inside

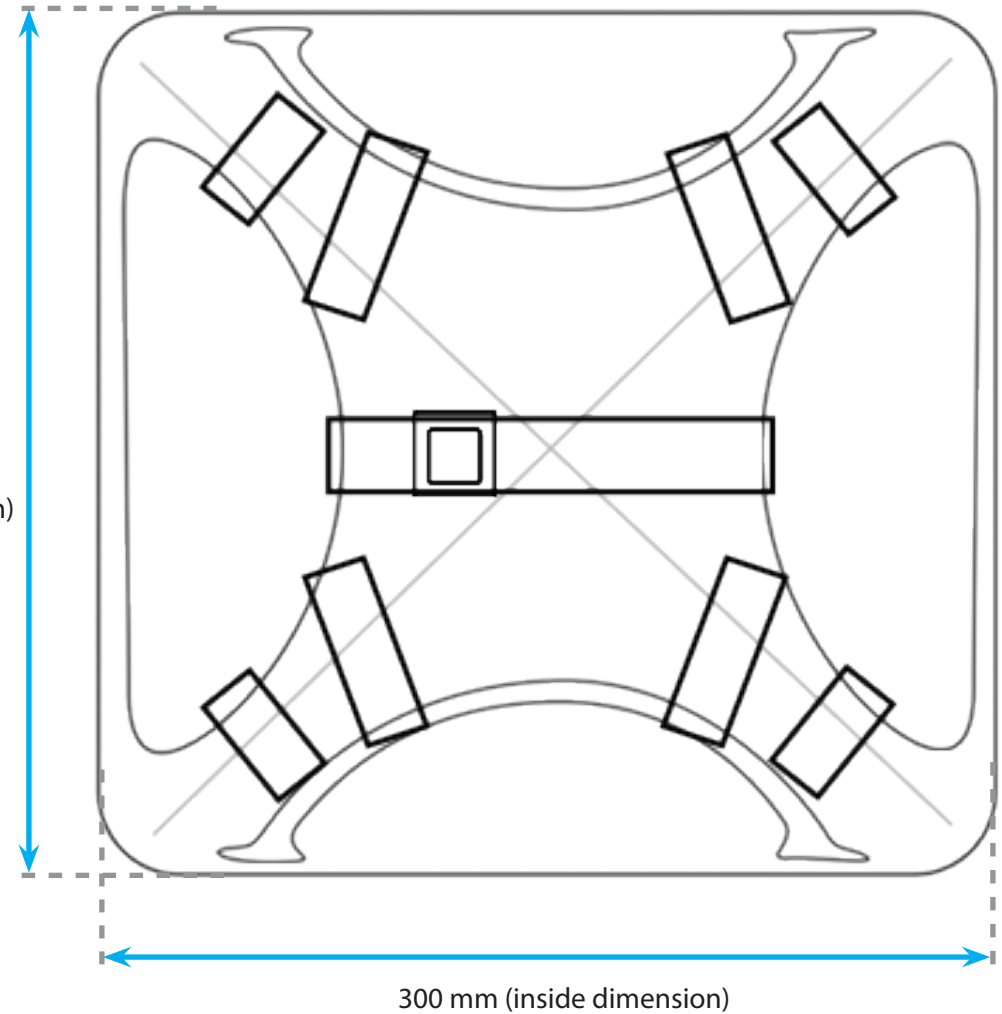
## EVA case inside

The inside of the EVA-case consists of:

1. Two velcro pouches
2. Two dividers
3. Elastic straps



310 mm  
(inside  
dimension)

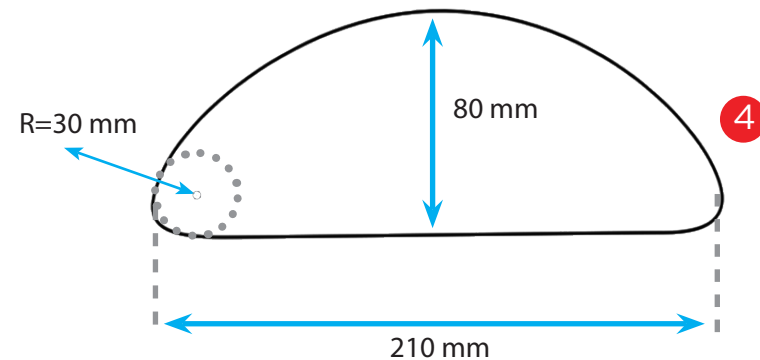
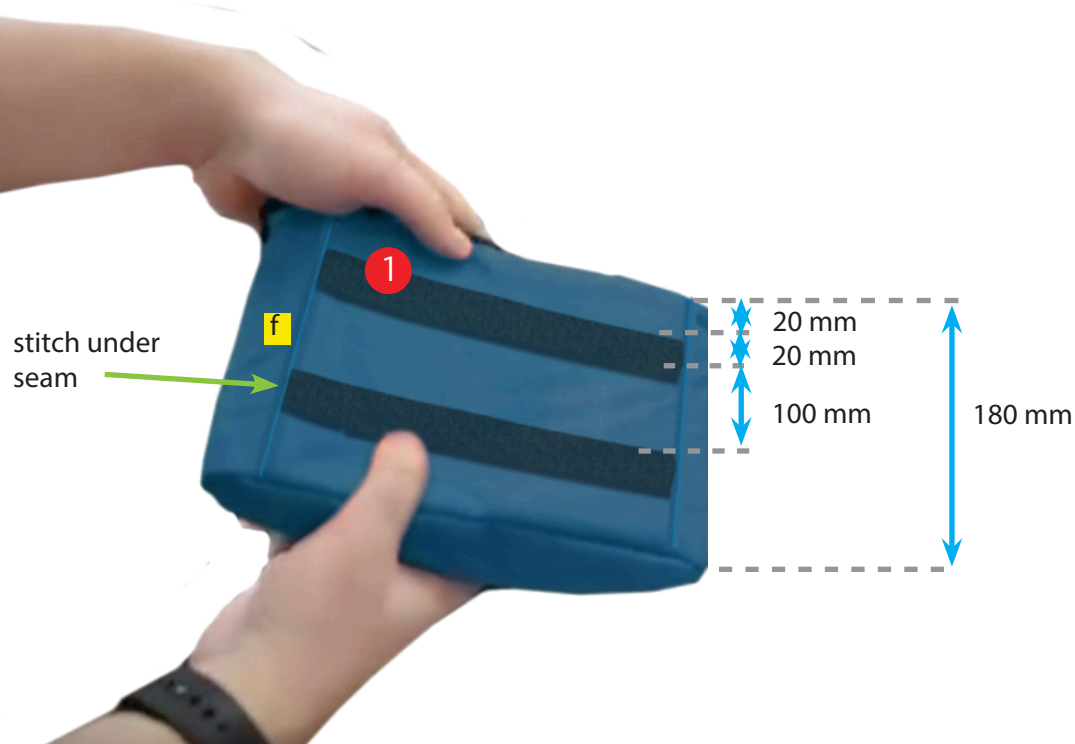


## [ B. EVA-case]

## 3. Details - EVA case pouches

### Velcro pouches

1. The pouches are made of material [f] and have two velcro strips at the backside
  - Walls are padded with 5 mm padding
  - Match color of velcro strips with the velvet blue
  - Inside is made of black or dark grey polyester material [k]
2. A black inside-out zipper covered by fabric at the top
3. The top is made of material [b]
4. Pouch has a half round shape

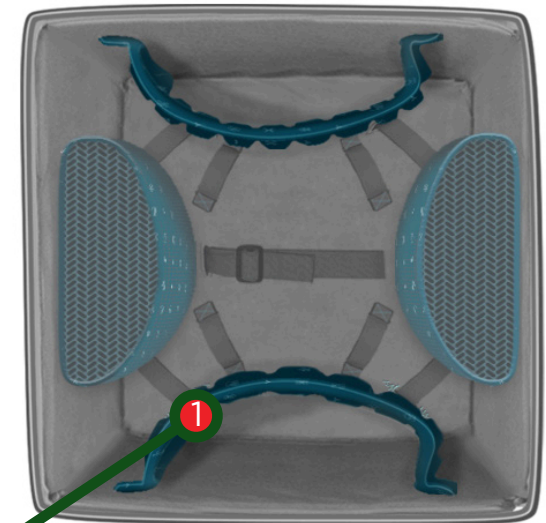
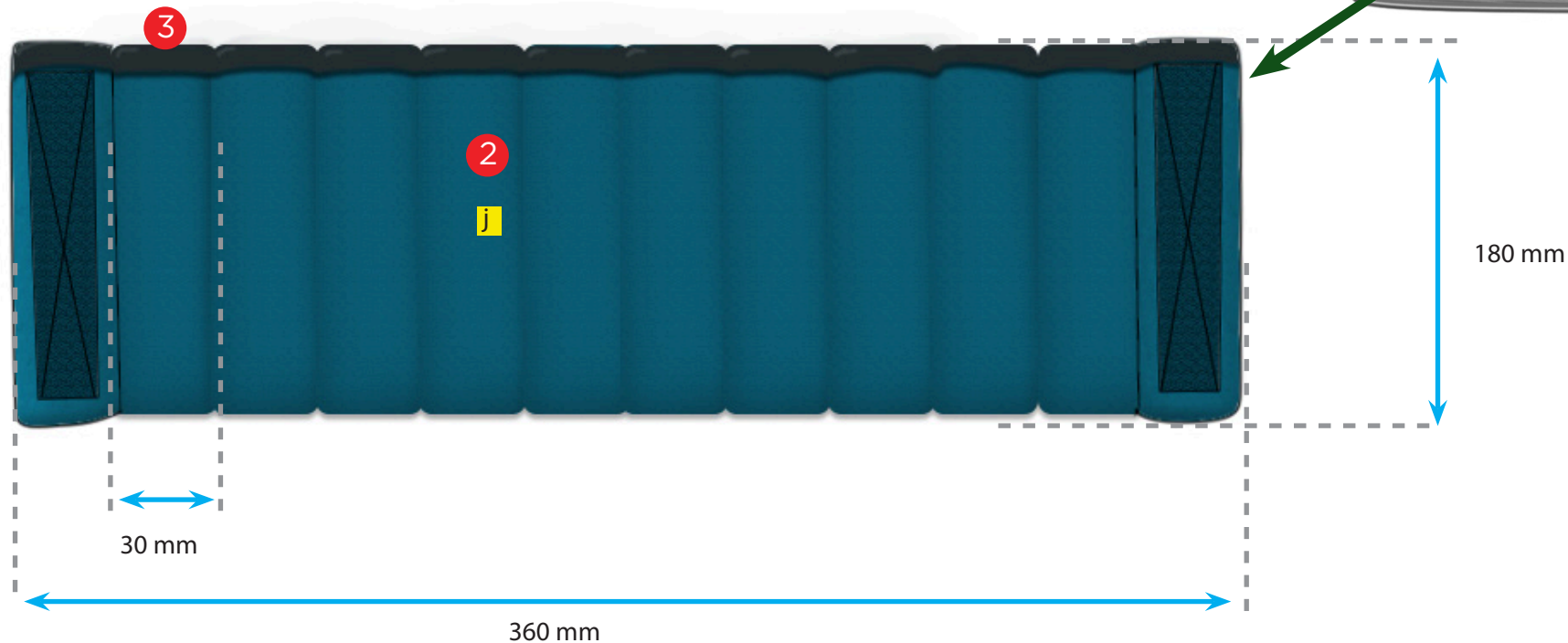


## [ B. EVA-case]

## 3. Details - EVA case dividers

## Dividers

1. Eva-case has two dividers, attachable to the side walls
2. The dividers are made of material [j] and have 10 x 30 mm paddings that make it easier to bent (+ two sides with velcro)  
- Padding thickness = 10 mm
3. At the top of the divider, a rim tape is sewed on, color ...



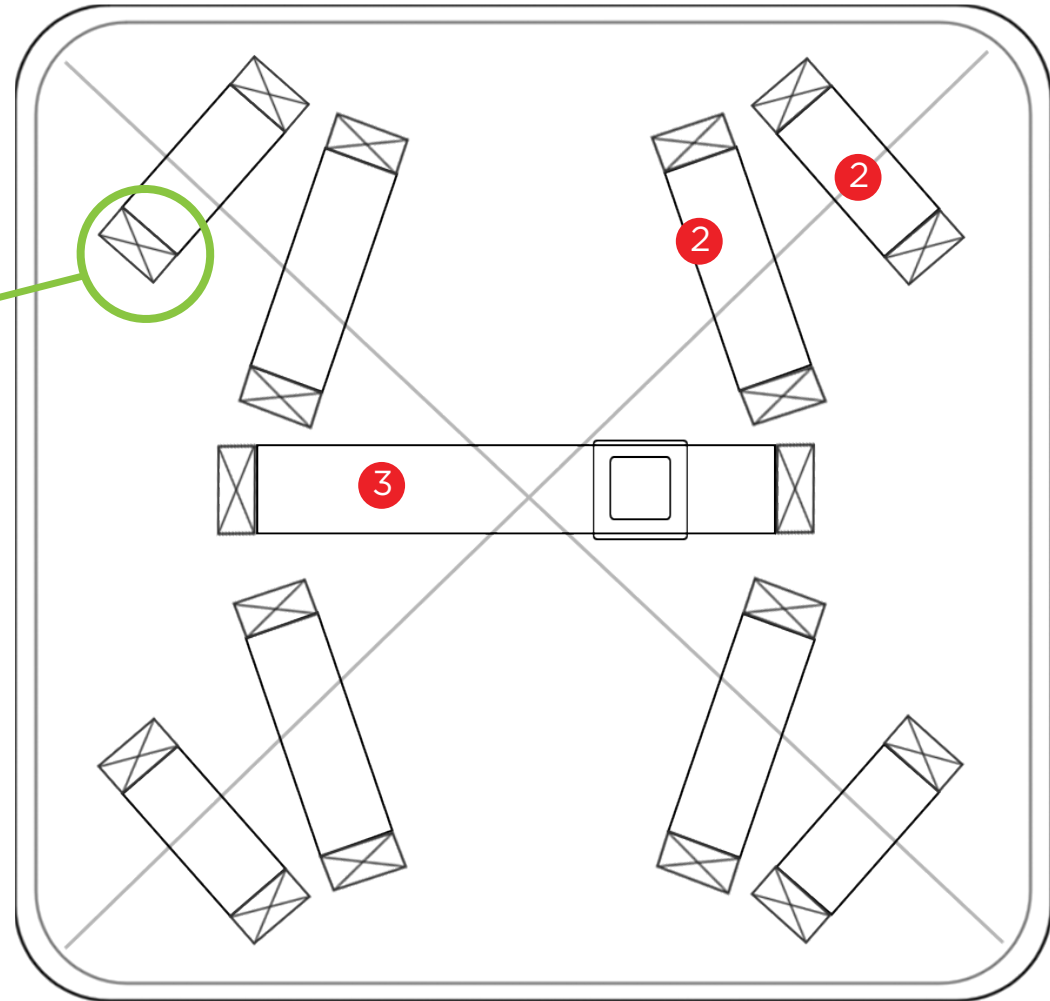
## [ B. EVA-case]

## 3. Details - EVA case straps

## Straps

1. Use seperately attached file: [RP\\_traps\\_template.pdf](#) as a template to stitch on the straps.
2. Use black elastic straps of 1 inch
3. Use black elastic strap of 1,25 inch with fastening buckle

Use most appropriate way for attaching the elastic straps to EVA-case



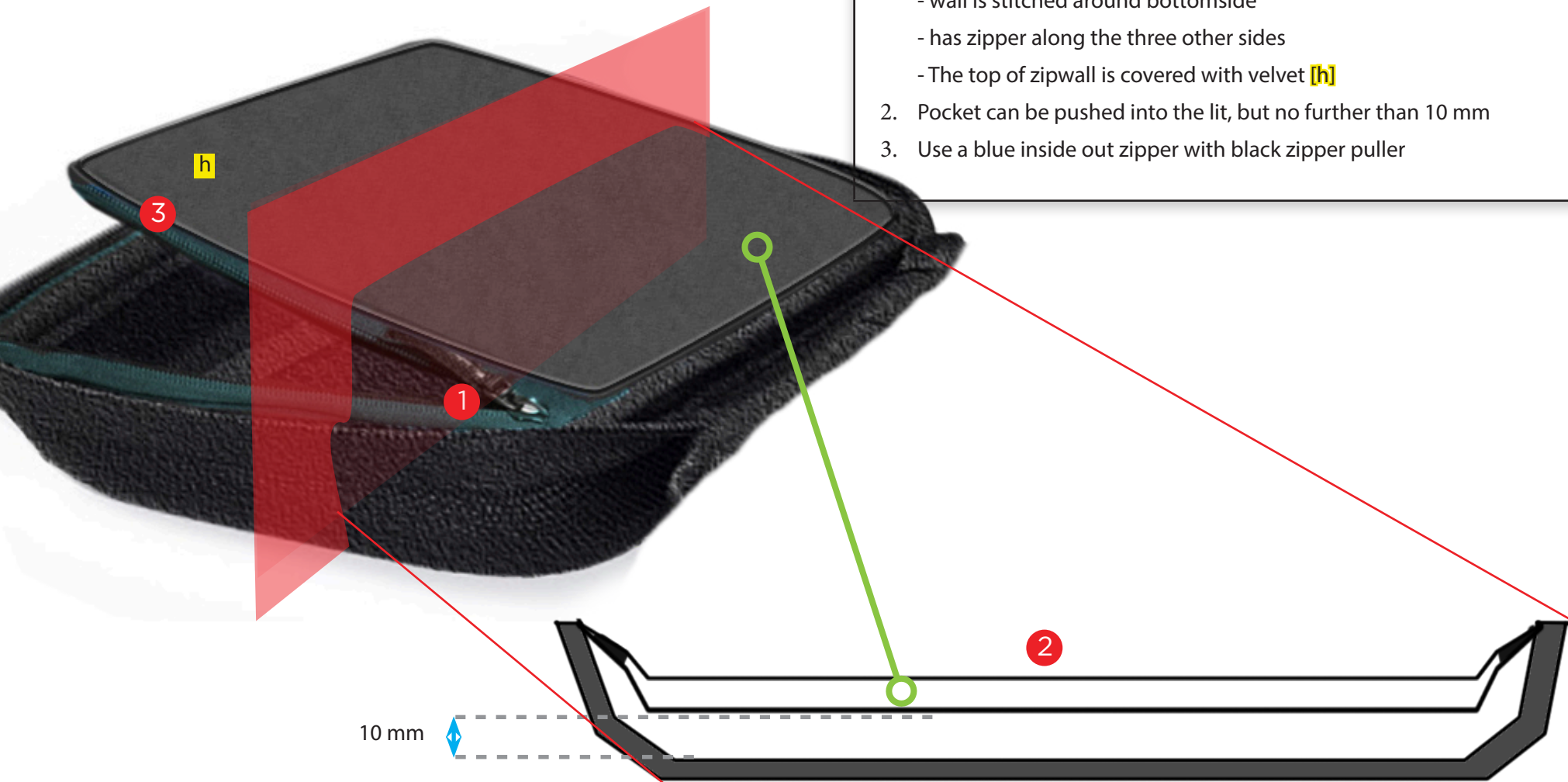


[ B. EVA-case]

## 3. Details - EVA lid

## EVA case lid

1. Lid of EVA case contains wall
  - wall is stitched around bottomsides
  - has zipper along the three other sides
  - The top of zipwall is covered with velvet [h]
2. Pocket can be pushed into the lid, but no further than 10 mm
3. Use a blue inside out zipper with black zipper puller

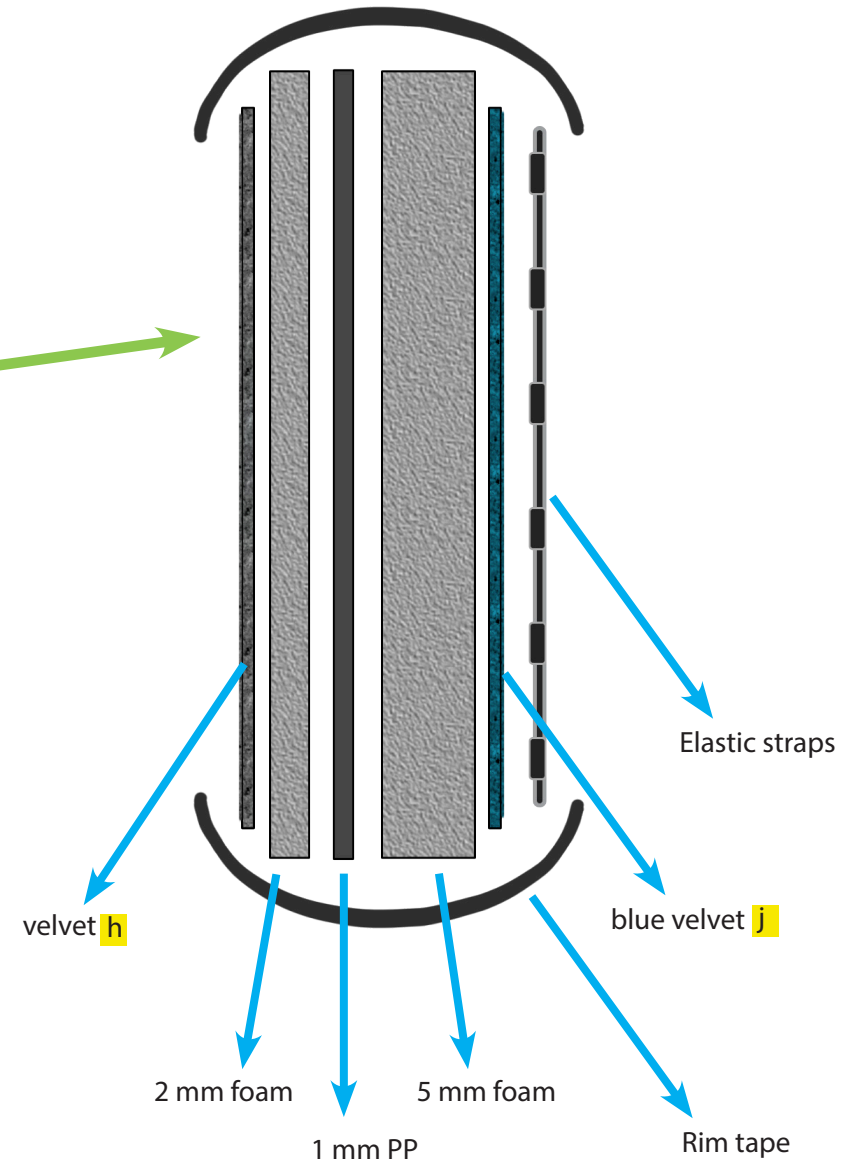
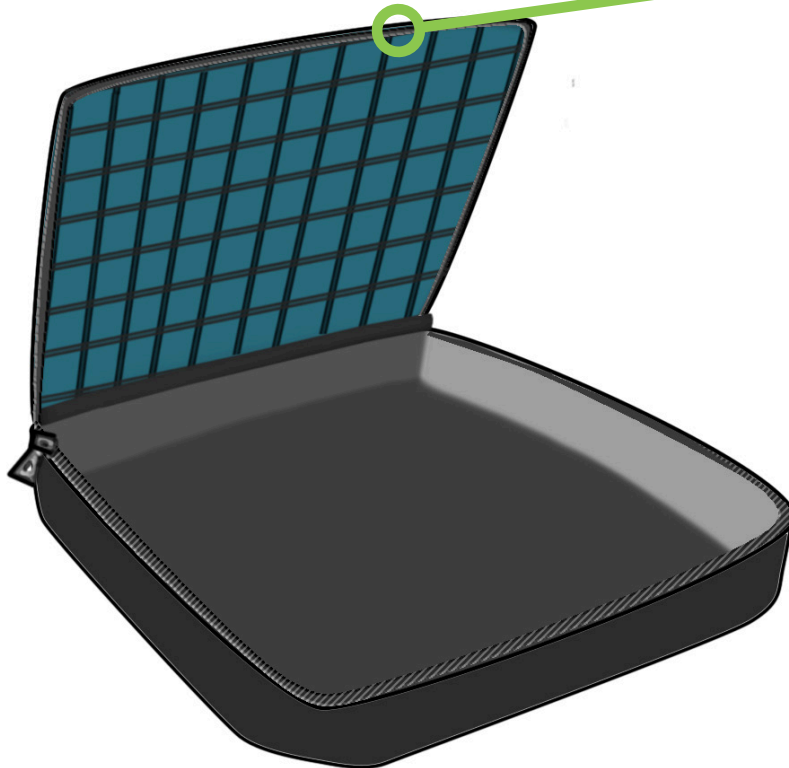


## [ B. EVA-case]

## 3. Details - EVA lid

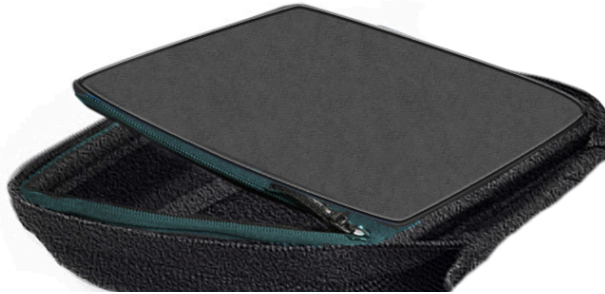
## EVA case flap

1. Flap in lid is made of a combination of 2 and 5 mm foam with 1 mm pp plate with velvet **[h]** on the outside velvet **[j]** on the inside  
- Inside contains elastic straps specified on next page.



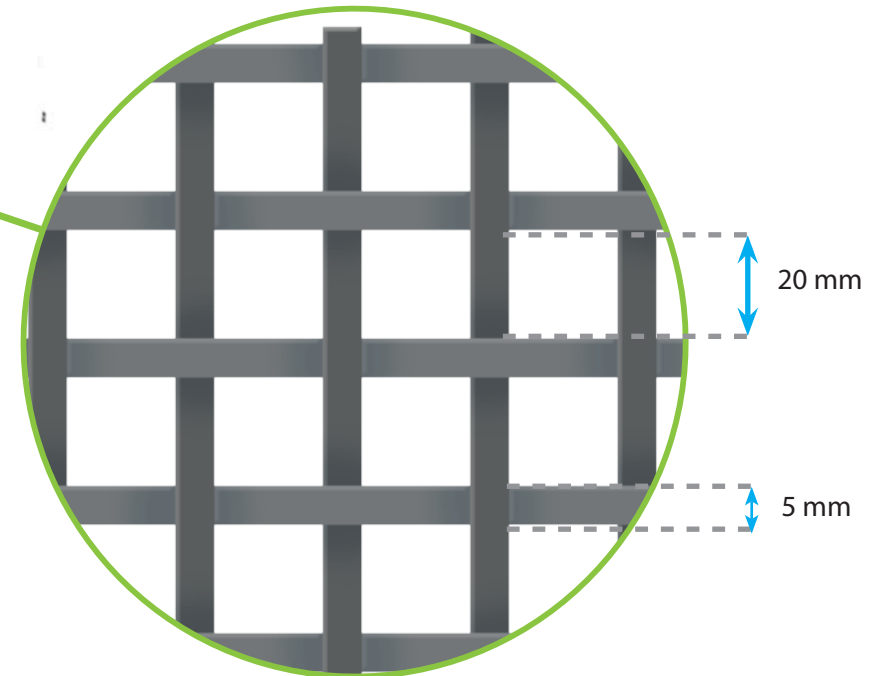
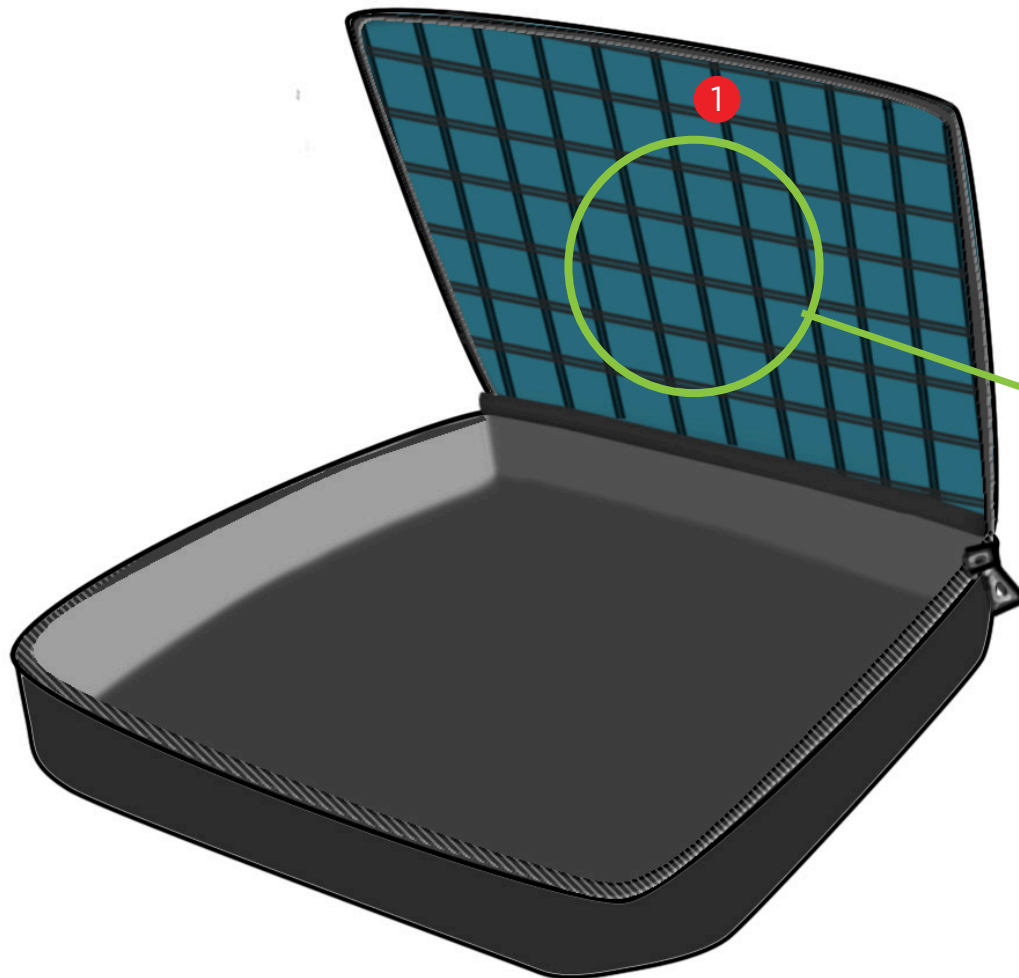
[ B. EVA-case]

## 3. Details - EVA lid



## EVA case lid - elastic straps

1. Add elastic weave inside wall of lid for drone propellers
  - Use elastic straps of 5 mm width
  - Create square spacings of 20x20 mm

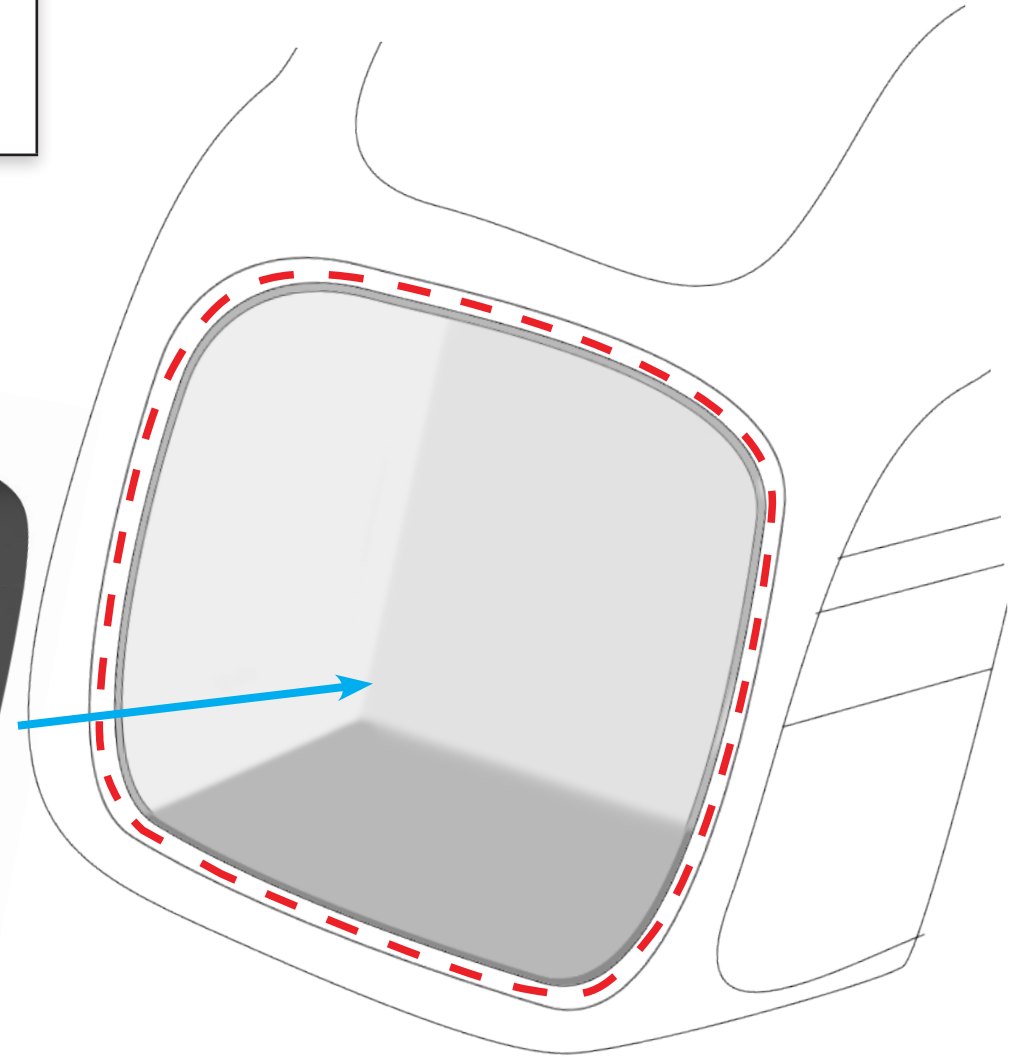
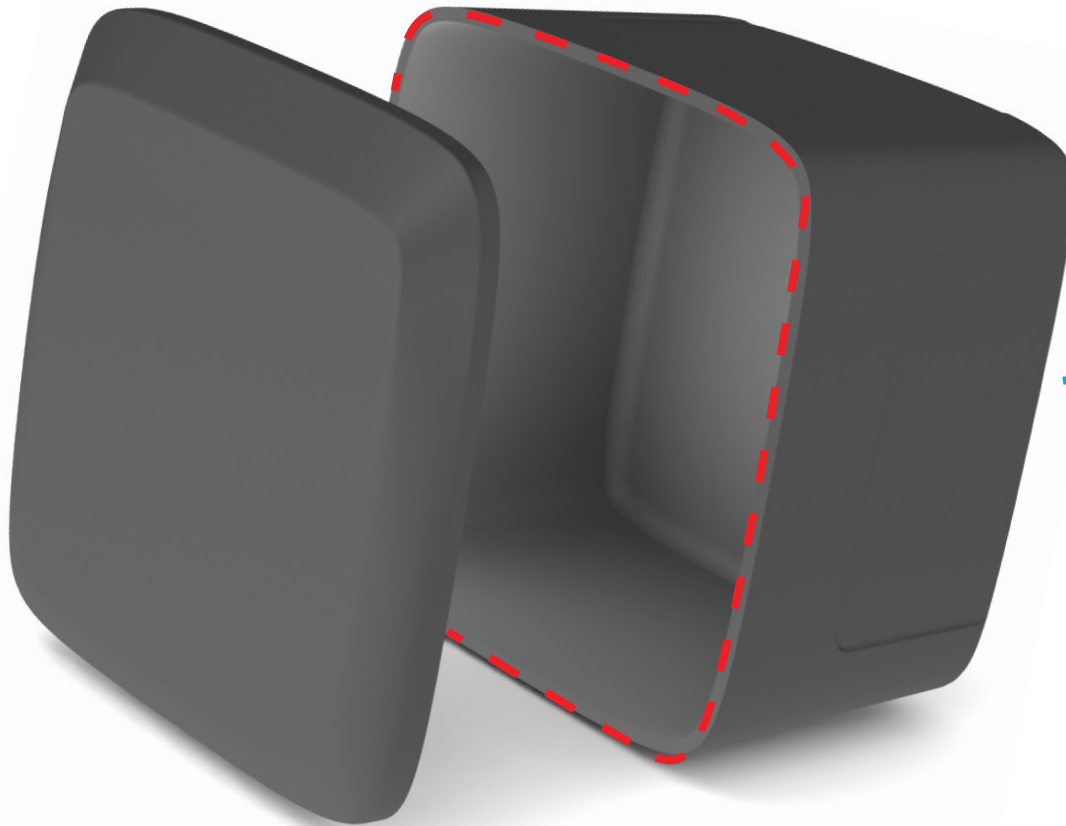


## [ C. Assembly]

## 1. Details - Assemble case

## EVA case to backpack

- Stitch Case base edge and zipper at together to the bottom bag edge as one total part





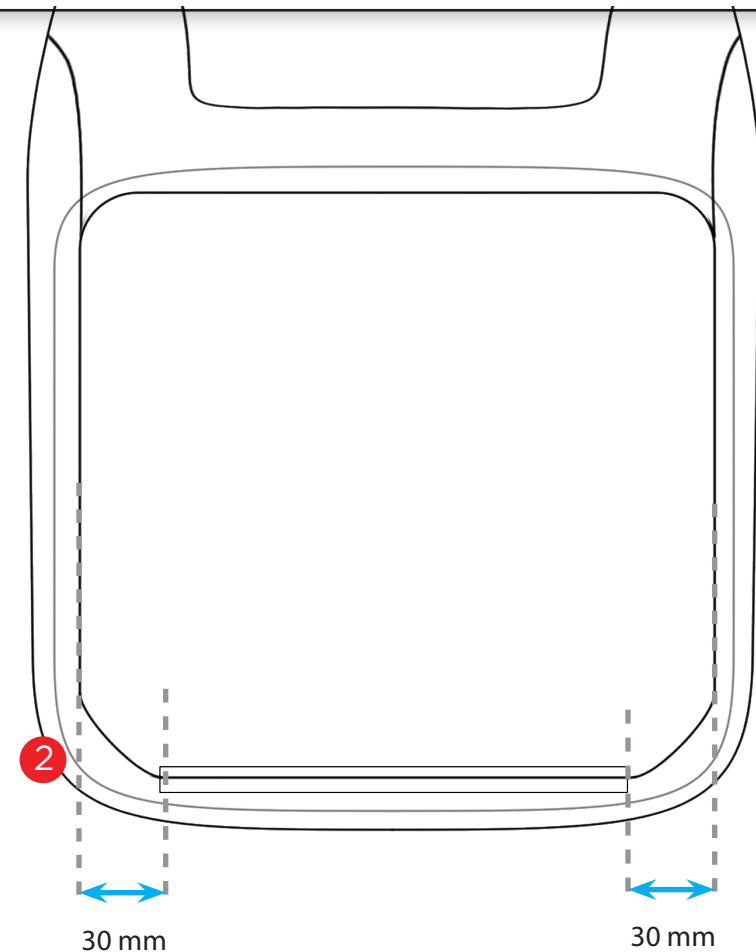
## [ C. Assembly]

## 1. Details - Assemble lid



## EVA case zipper

1. Zipper attaches lid of EVA-case to bottom part of EVA-case
  - Black waterresistant zipper with black zipper puller
  - inside-out zipper
2. Zipper should go around the corner 30mm on each side



## [ C. Assembly]

## 1. Details - Assemble lid



## EVA case lid to backpack

1. Attach lid to backpack with a 240 mm wide ... (?) strip

