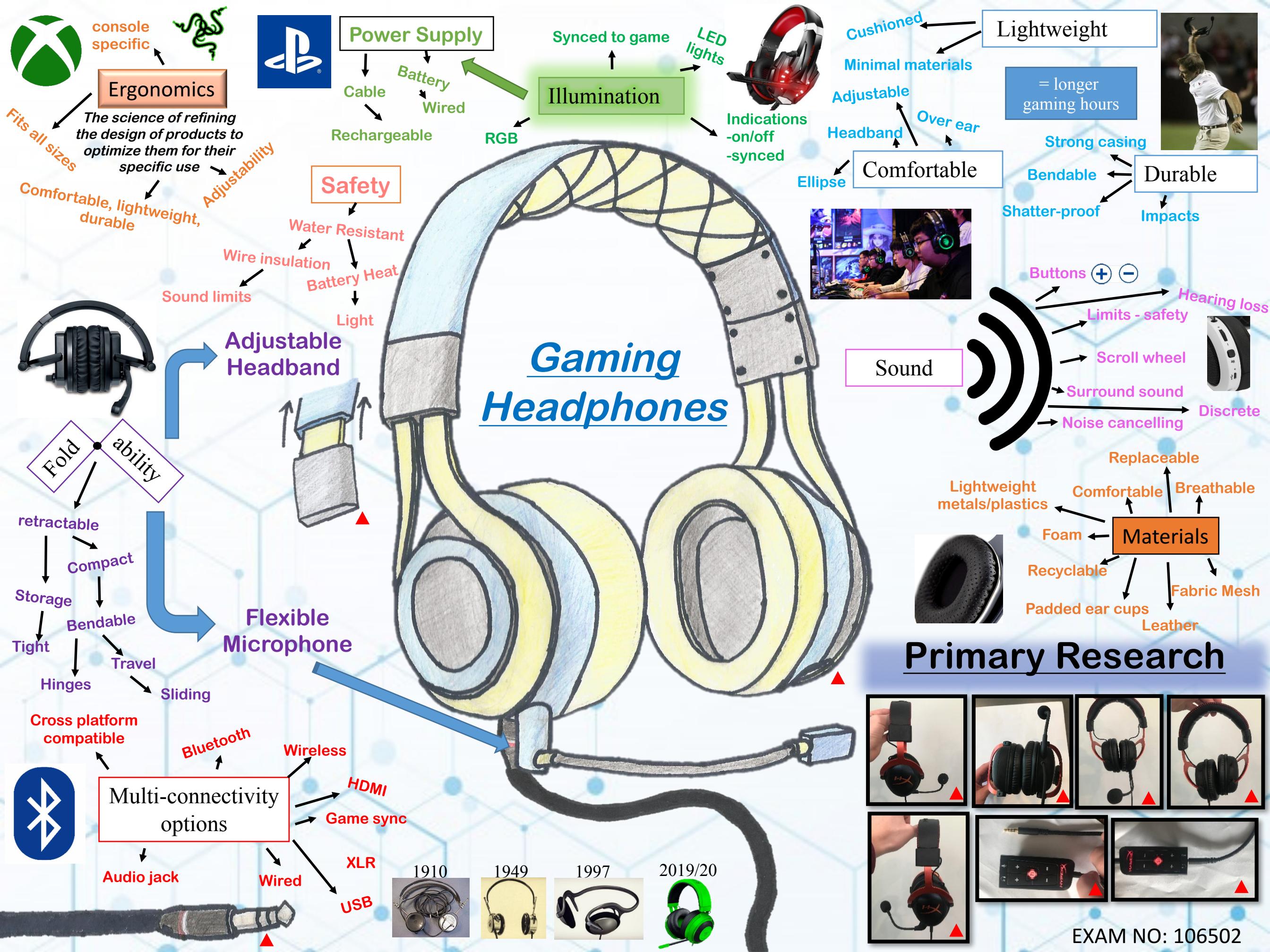


Design Communications Graphics – Student Assignment 2020

Exam Number: 106502





Gaming Headphones

Ergonomics

console specific
 Fits all sizes
 The science of refining the design of products to optimize them for their specific use
 Adjustability
 Comfortable, lightweight, durable

Power Supply

Cable
 Battery
 Wired
 Rechargeable

Illumination

Synced to game
 LED lights
 Indications -on/off -synced
 RGB

Lightweight

Cushioned
 Minimal materials
 Adjustable
 Headband
 Over ear

= longer gaming hours

Comfortable

Ellipse

Strong casing

Durable

Bendable

Shatter-proof

Impacts

Safety

Water Resistant
 Wire insulation
 Battery Heat
 Sound limits
 Light

Adjustable Headband



Foldability

retractable
 Compact
 Storage
 Tight
 Hinges
 Sliding

Flexible Microphone

Multi-connectivity options

Bluetooth
 Wireless
 HDMI
 Game sync
 XLR
 USB
 Audio jack
 Wired



Sound

Buttons + -
 Hearing loss
 Limits - safety
 Scroll wheel
 Surround sound
 Noise cancelling
 Discrete

Replaceable

Lightweight metals/plastics

Comfortable

Breathable

Materials

Foam
 Recyclable
 Padded ear cups
 Leather

Fabric Mesh

Primary Research



Output 1: Design Research



Power Supply

Gaming Headphones can come in 2 forms: Wired or Wireless. Most wireless headphones have a built in rechargeable battery with large over-ear headphones having space for a large battery that can be charged by a USB cable and good quality headphones can give you 20 to 30 hours of power. Wired headphones are simply attached through USB cable directly to your gaming device or computer. While wireless headphones may give you more freedom, the battery could throw off the weight distribution of the headset or make it too heavy making it incredibly uncomfortable. Therefore the materials used in that must be as light as possible and the shell must be durable to prevent the battery from breaking or combusting.

Design Brief

As gaming headsets are worn for extended periods of time, they are designed to be durable, lightweight and comfortable. Design features often include an adjustable headband, molded/padded ear cups and a retractable/removable microphone. Other features frequently include foldability, adjustable volume control, multi-connectivity options, power supply, illumination, etc.

- Carry out a design investigation of gaming headsets in graphic format. Your investigation should include an analysis of physical form and shape, ergonomics, materials, safety features, power source, etc.

Sound

The sound from a good quality headset should be clear, discrete and cancel out as much external noise as possible. There are 2 types of noise cancelling headphones: passive and active. Passive headphones stop external noise just from the materials and padding it consists of. While some passive headsets are better than others an active headphone are truly noise cancelling. They sense the input of noise from the microphone and send a frequency that cancels the external noise through the ear pieces as well as game noise making all external noises silent. This in turn helps increase the clarity of the in-game noise and the discreteness of your noise as you wouldn't need to bring the volume as high as well as the padding stopping most of the escaping noise. This is why active headphones would be considered to have very good ergonomics as they optimise the gaming experience and give the wearer an edge over other players

Materials

Originally, the first version of headphones were made from simpler easily accessible materials like rubber leather copper and ceramics. As our use of material and technology advanced so did headphones with artificial leather, vinyl, plastics and silicone being more popularly used. As the popularity of gaming grew headphones were designed specifically for gaming using the lightest, most comfortable and durable materials so that people can play their favourite game for long hours without being annoyed by the headphones they wear. The materials used in different gaming headphones also vary depending on price range. For example an average, on-ear headsets will use in most cases mostly PVC, artificial leather, memory foam and rubber while a more expensive over-ear headphones will use more advanced materials of polyurethane, real leather, velvet and velour. It is clear the materials used in gaming headphones vary depending on the type and purpose of the headset and will continue to advance with the growth of gaming culture.

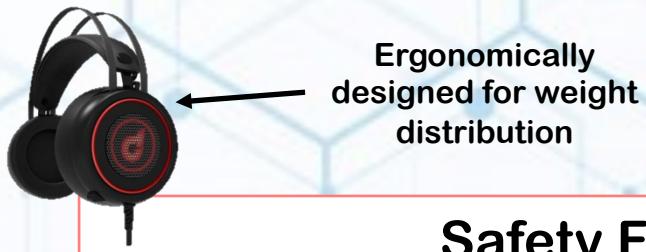
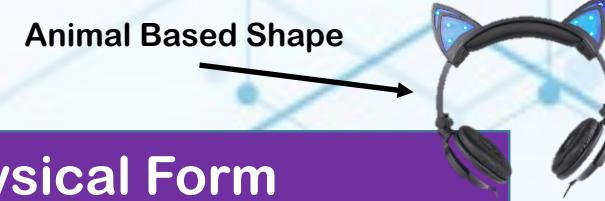
Ergonomics

Ergonomics is the science of refining the design of products to optimise them for their specific use. With gaming headphones the main ergonomic factor is to make the headset as comfortable as possible so it can be used for long periods of time but the other specifics can change. For example a professional e-sports gamer will need high quality active noise cancelling headphones for the sound of the crowd cheering, while an average gamer at home just wants good sound quality and a physically comfortable experience.



Illumination

Illumination on a gaming headphones can provide many functions. And are a common feature on most headsets. They are often used to indicate whether the headphones are on or off but some headsets use many lights to display mood in the game or in game noise such as lighting up in time with a shooting gun. They are commonly LED lights that are used as 95% of the power in LED lights is efficiently used with only 5% being lost as heat. This helps reduce the need for as much power and makes it safer as overheating is less likely



Safety Features

In todays society gaming culture is growing at a massive rate and regular gamers aged 18-25 spend more than 7 hours each week playing so headsets must adapt to make themselves comfortable and most of all safe for long periods of time. Gaming headphones weigh from 100 to 400 grams and while that may not seem like much it can become irritating and even painful for the gamer if too much stress is on their ears or head. Therefore it is important to have sufficient padding and weight distribution over the ears and head. A factor of this could be the size of the battery if the headphone is wireless. A large power supply could put off the balance of the headphones and cause even more problems for the user. Also with any piece of technology the wires must be insulated and safe and a better headset may use waterproof materials in the case of sweating or spillage.

Shape and Physical Form

Nowadays there is huge variety in gaming headsets you can buy and with that there is as many options in the shape and design of your headset. Some headsets are made with a certain image or design in mind for example the animal ears design. While some are more sleek and futuristic looking such as a Virtual Reality gaming headset. Nowadays we can change the shape of our headphones ourselves because of adjustable headbands and flexible microphones so that the form is truly designed for the player. The shapes on a headset are roughly meant to mimic the human anatomy. The ears are a general round shape but some headphones go closer to a circle while others try and mimic the oval ear shape. Also the headband obviously curves with the shape of the skull while better more comfortable ergonomic headphones will have padding or memory foam and an adjustable headpiece to make the shape accurate for the user specifically.



Output 2: Compare and Contrast



HyperX Cloud II

VS

Turtle Beach Ear Force XL1

Power

Both headsets are wired so they get their power from an external source and have no need for batteries. The Ear Force XL1's wire is excessively long and complicated with a 4.9 metre cable length that also splits into 2 wires as an RCA connector that must be connected into your device. This affects the ergonomic effectiveness of the device as many laptops, computers, and TVs don't have RCA connector ports anymore.

The HyperX headset has a far superior and simple aux cable that can be connected into a port in a computer or controller. However this means if it is connected into a wireless controller it may drain the battery life of the controller quicker.

RCA Connector



Aux Cable



Shape and Form

Both headsets feature an over the ear design making them both more comfortable and with better sound. The XL1 has 1 headband going around from one ear cup to the other while the Cloud 2 has a headband adjuster attached to the headband which gives it more range for movement than the XL1. The Cloud 2 has a wider, thicker shape making the area on the head more spread out meaning less pressure on the user. The XL1 has a skinnier area meaning more pressure making it less comfortable for the user and therefore worse ergonomics.



HyperX Cloud II



Turtle Beach XL1

Leather Ear Cups



Materials

Both headsets have a leather padding on the headband for comfort and the HyperX has a leather padding ear cup while the EarForceXL1 has a mesh ear cup both of which are comfortable but the mesh ear cup has a risk of abrasions on the skin due to it being much coarser than leather. However the HyperX Cloud 2 has a very durable aluminium frame meant to withstand any force that it might be hit with. In choosing this though, it sacrifices flexibility on impact so if a force is strong enough may break the parts apart completely.

The Turtle Beach Ear Force XL1 is composed of hard plastic shell that sacrifices flexibility like the HyperX but is less durable and has the potential of shattering if the force is strong enough which is a huge risk in safety

Mesh Ear Cups



Sound

The HyperX Cloud 2 headphones feature an over the ear cup to help with noise cancellation as it does not have active noise cancellation.

The Turtle Beach Ear Force XL1 is a wired headset that has passive noise cancellation but over the ear cups and amplified audio for a more immersive sound. The Ear Force XL1 has a more powerful sound pressure at 120dB/mW to the HyperX's 98dB/mW this means that when given the same noise the Ear Force's will come out louder. However the HyperX has a larger frequency range getting up to 25000Hz giving it a crispier and clearer sound.

RCA Connector/ A/V Cable

Connectivity

The HyperX is connected to the controller through a standard male connector so it can also be used with a phone or laptop. The cable is also detachable and replaceable with another head e.g. USB.

Both headsets feature an in-line control panel but the ear force XL1 has a messy 4.9m cable length and has a USB for the console and an RCA connector for the screen and a USB connector for the controller

The XI1 can only be used with Xbox 360 while the Hyperx can be used with everything except on Xbox Live. I think it is clear that the HyperX cloud 2 has much more multi-connective headset that is cross platform compatible



Ergonomics

The main factor in a good ergonomic gaming headphone is that they are as comfortable as humanly possible for the user so they can have more hours of gaming but there are other factors too which are all of the mentioned comparisons between the 2 headphones. The best, ergonomic headphone is one that is consistently the best in all of these qualities. Materials, Power, Sound, Shape and Form, Connectivity, Illumination, Safety and Adjustability.

While there are both advantages and disadvantages to both headsets the HyperX Cloud II has to be the superior headset as it beats the Turtle Beach XL1 in almost all of these.

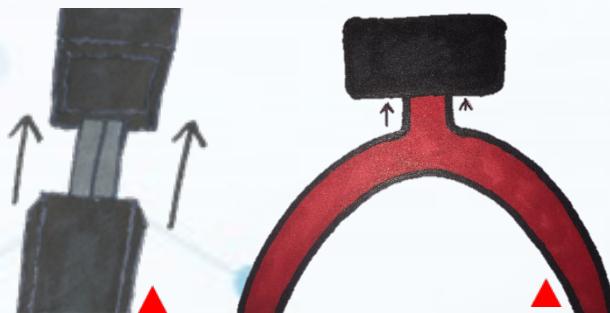
Illumination

Neither the HyperX or the Ear Force XL1 have any illumination feature. Illumination is a huge potential on any gaming headset for communicating theme or mood in a game, working with the time of the sounds in the game adding to the immersiveness or even simple on/off features and it is huge waste of this potential. I think this is a common design fault in both gaming headphones.



In-Line Connector

VS



Adjustability

Neither the HyperX or the Ear Force headsets have foldable qualities however the HyperX has a removable microphone and wire making it better for storage especially with the Ear Force XL1 cable being almost 5 times the length of the HyperX's cable.

Both are extendable at the side of the headband. Both headsets feature a flexible microphone chord but the XL1 also rotates at the side while the HyperX's microphone is fixed in place

Safety

The HyperX Cloud 2 weighs 350 grams, this is a heavy enough headphone but it has an over the ear design and a leather and foam padding on the ears and around the entire headband, giving sufficient support and comfortability that it will not be painful to the user. However the HyperX is not water sealed this means it is more susceptible to damage from dust, rain, sweat or water splashes.

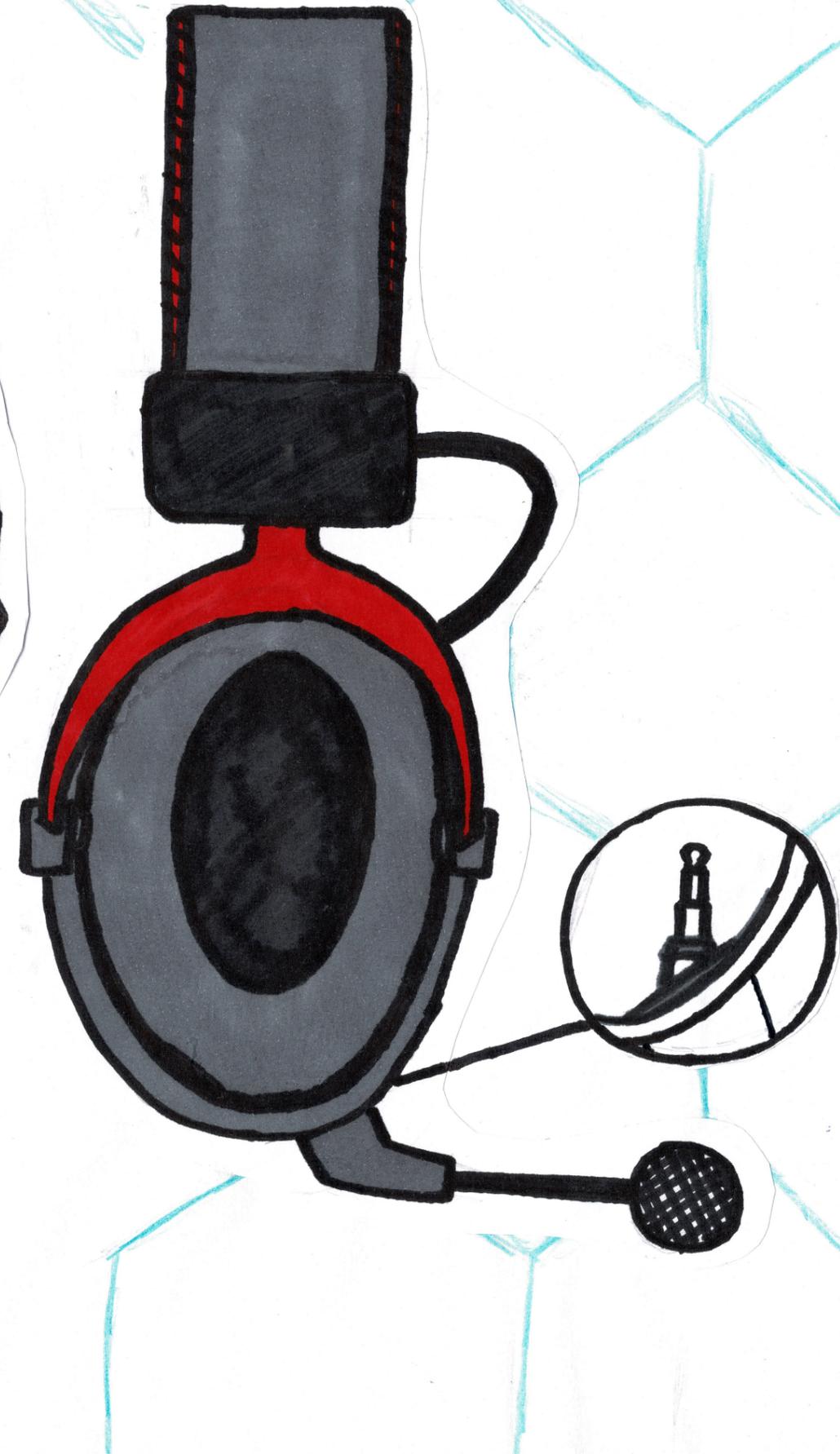
The Turtle Beach headset weighs a very light 181 grams and has an over the ear design with a fabric mesh padding on the ears and a leather padding on the headband this is a very comfortable headset and could be used for long periods of time without any irritation.

The Turtle Beach also is not water sealed. Both headsets are wired and therefore do not have a large battery throwing off the weigh distribution of the headset.

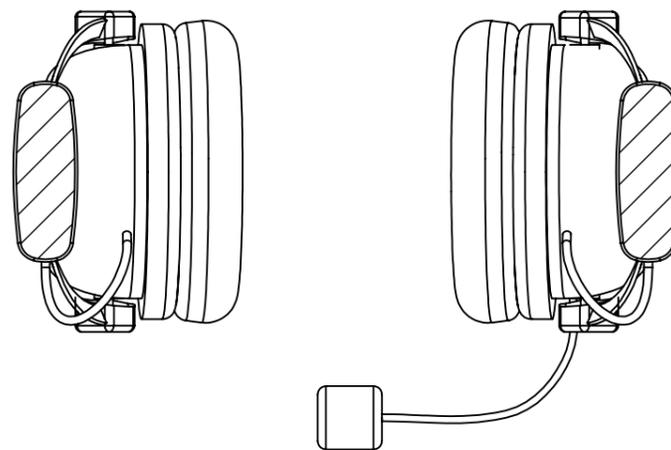
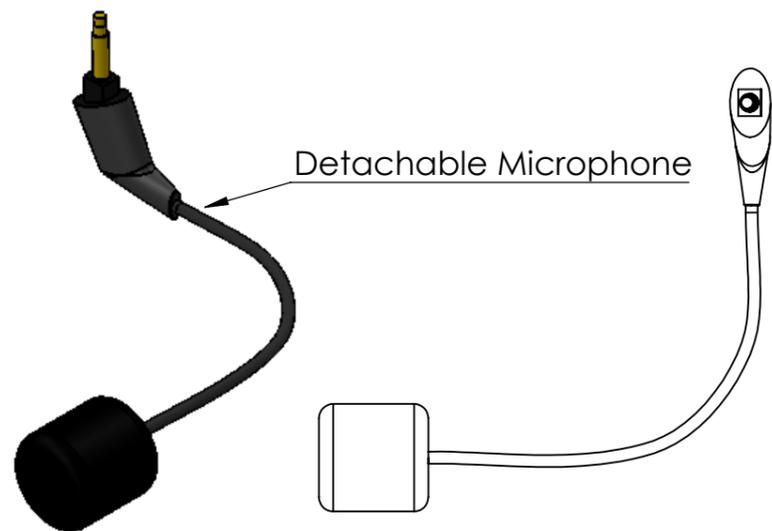
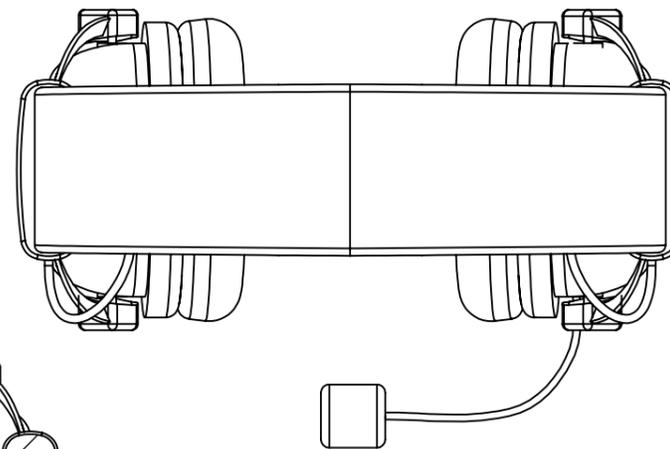
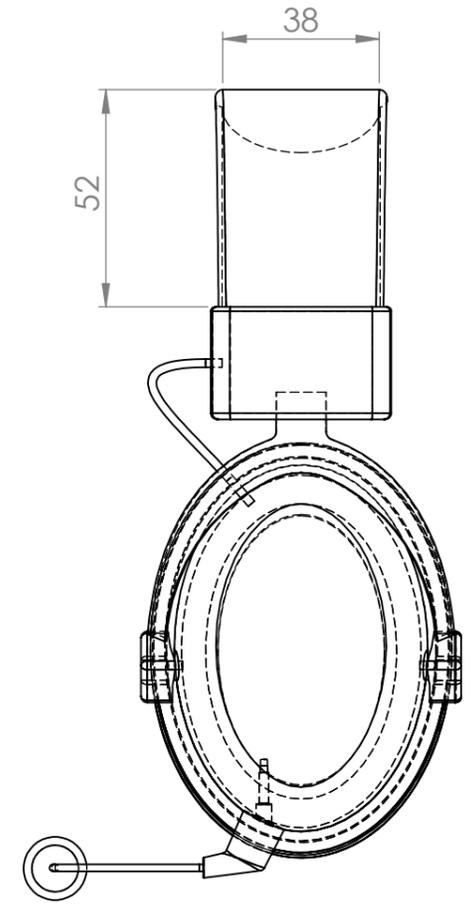
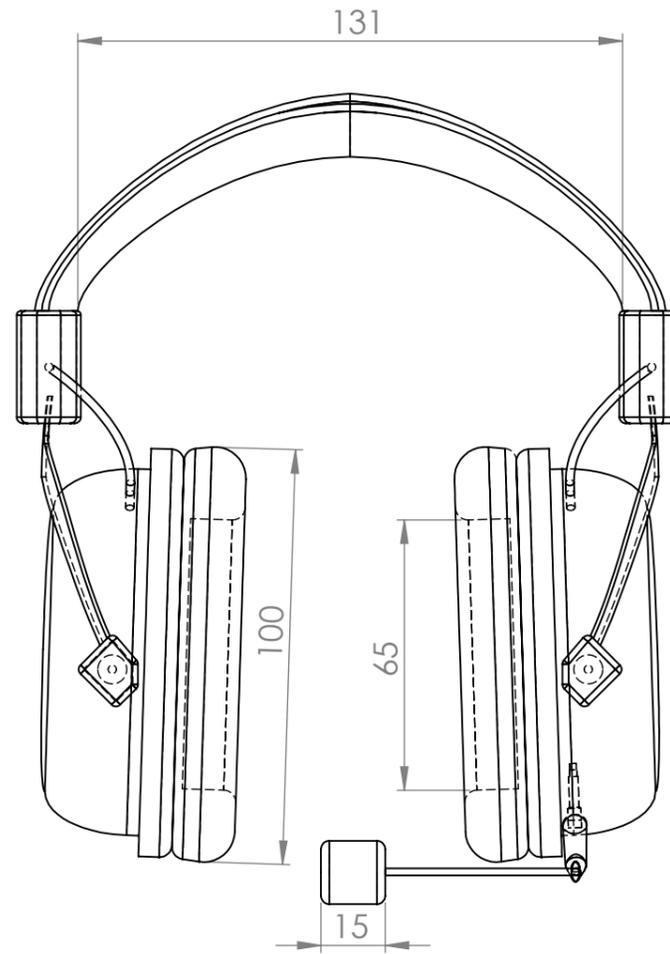
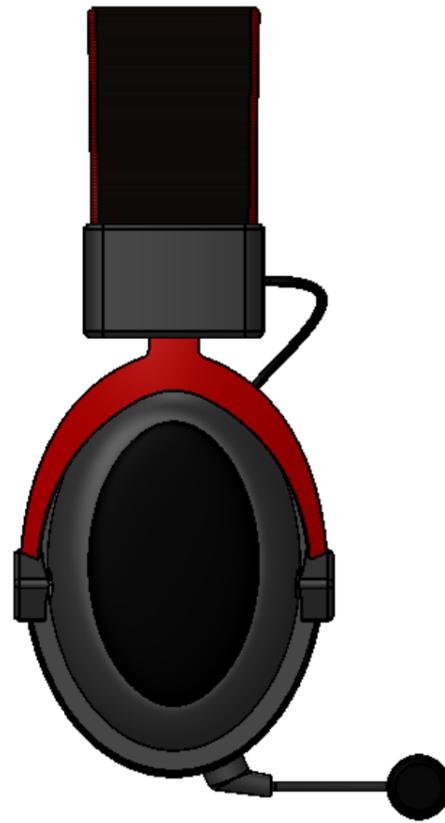


XL1 Ridiculous amount of wires





Scale 1:1.2



Aerial View of Ear Pieces Cross-View

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Output 5

Scale 1: 1.7

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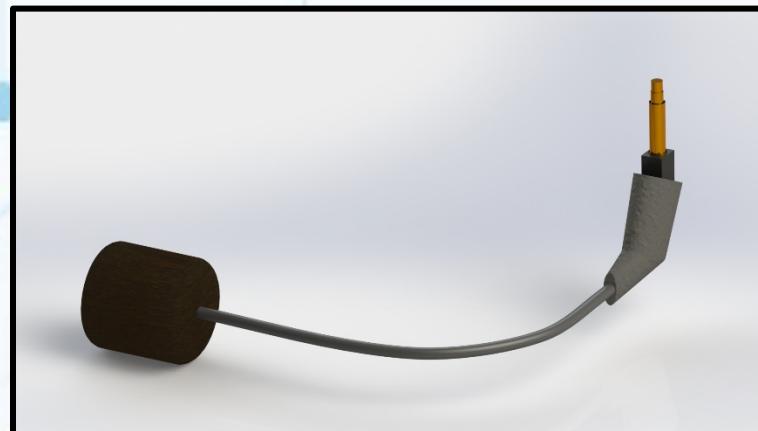
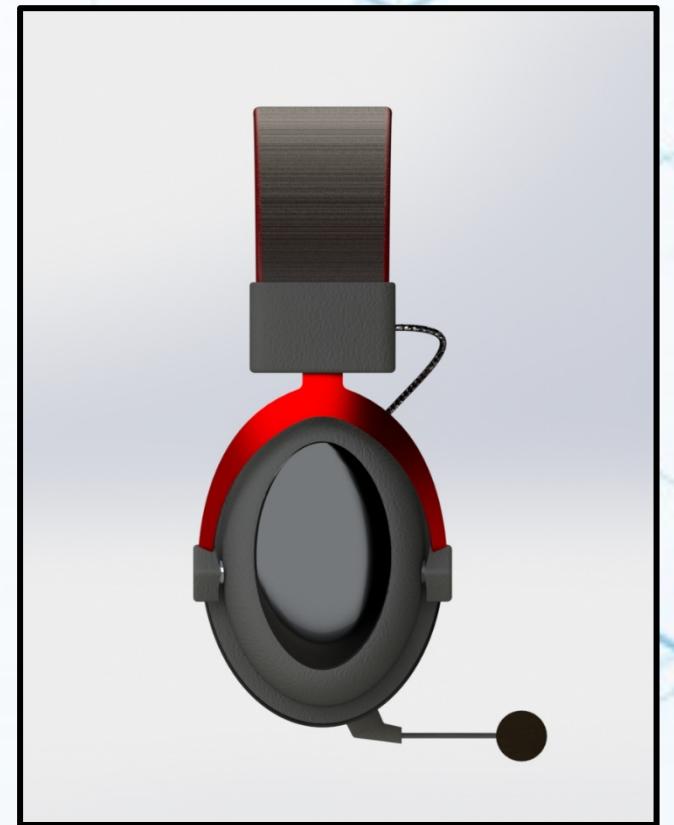
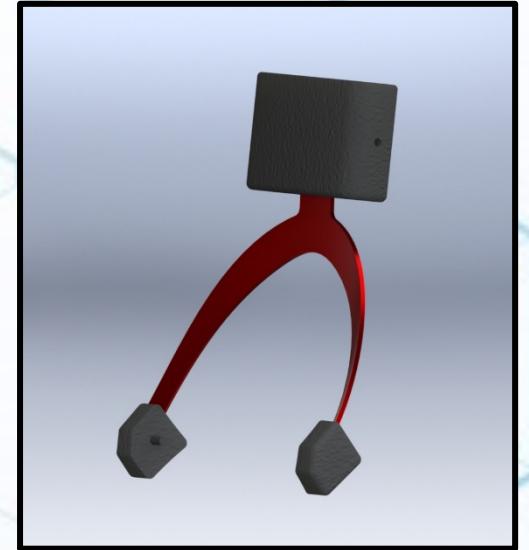
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Scale 1:1

Exam Number: 106502

Output 6: Photorealistic Images

EXAM NUMBER: 106502



Output 7: Development of Design Ideas

Theme

The theme of this headset is Retro Gaming. It is inspired by classic arcade games like Street Fighter and Pac-Man and consoles such as the Nintendo Super NES, Nintendo 64 and Gameboy. As well as the retro aesthetic, style and technology

Target Market

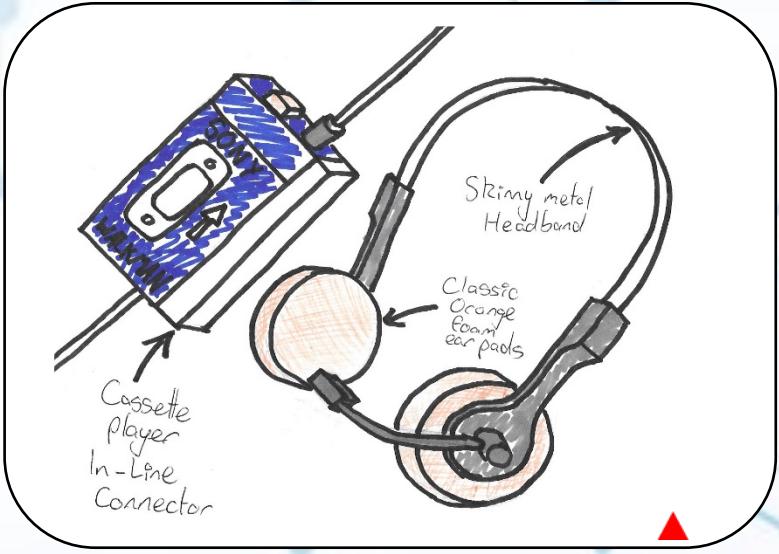
The target audience for this gaming headset is the growing niche of young people who appreciate vintage and retro style, gaming, technology and aesthetic. As well as the older generation who would have spent a lot of their childhood playing classic arcade games and consoles.

Design Brief

The popularity of older style and technology that is now considered retro is increasing rapidly.

- Design and graphically communicate a new concept for a gaming headset that takes inspiration from retro style, gaming and technology. You may also consider adjustability, illumination, shape, connectivity and comfortability

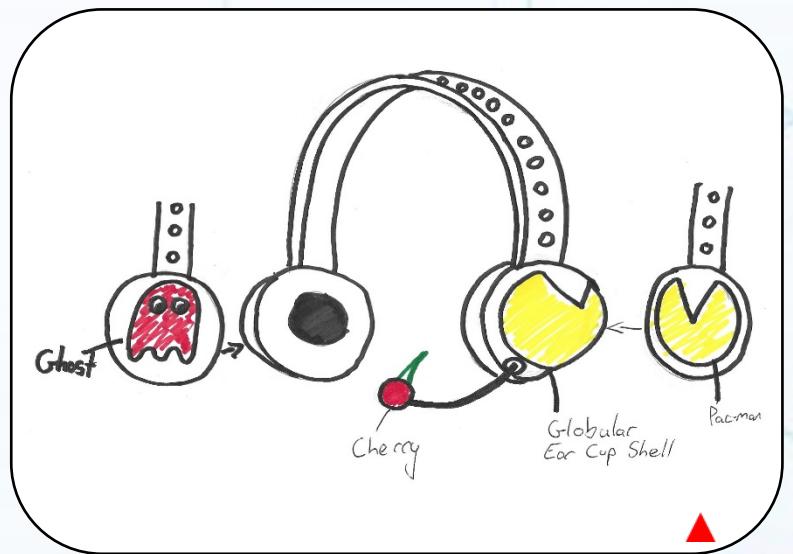
Initial Ideas:



One of my first ideas was to design a headset that took heavy inspiration from an iconic retro pair of headphones, the Sony Walkman.

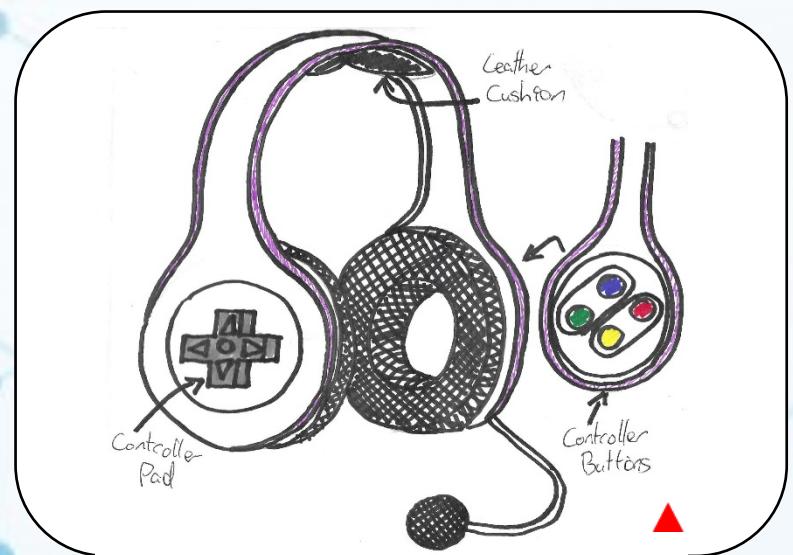
While I liked the idea of using the Sony Walkman, I felt it was missing out on the potential of so many other features of a gaming headset and loses the gaming aspect of the theme.

My second idea was to design a headset with a gaming headset taking inspiration from classic arcade characters, particularly Pac-Man.



However I thought that this idea heavily missed the opportunity to incorporate the retro theme into the functionality of the headset.

Lastly, my final idea was to make a gaming headset that was based of a classic retro Super Nintendo Entertainment System (SNES) controller. It fully embodies the theme of retro gaming as well as looking colorful and eye popping. Also I could use the buttons from the controller as functional features on the headset



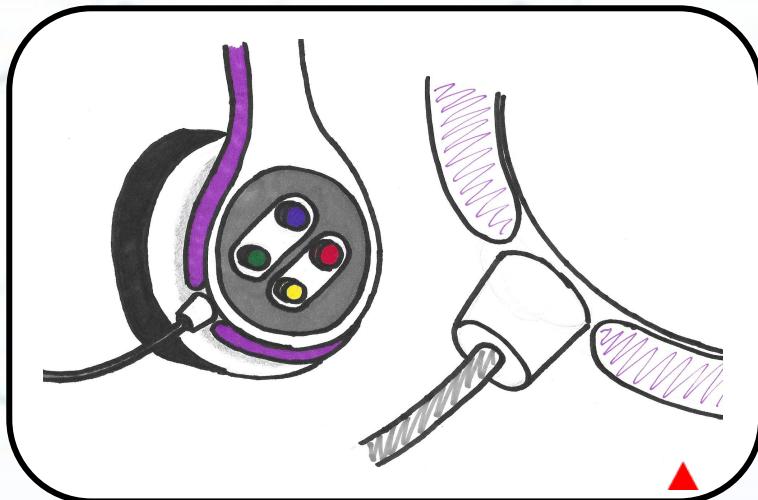
I also decided to incorporate the retro LED aesthetic into it as a rim on the headband and down the side to give it a cool looking illumination in line with the neon retro aesthetic that can also be functional.



Output 7: Development of Chosen Design and Final Form

Microphone

One problem I faced was deciding what was the best way I can attach the microphone to the headphones without interfering with the ear cup design and still having it be as flexible and foldable as possible. This is why I decided on a microphone that was fixed to the front of the headset with flexible range in the wire, similar to the HyperX Cloud II microphone. This way it would not cover the communication of the design or get in the way of the controller buttons on that side. However it may interrupt the LED light going around the ear piece.



Aesthetic

I really wanted to closely communicate the design from the SNES as if a controller had been transformed into a headset. This is why I chose against adding any décor or memorabilia from the classic video game era like from my 2nd design idea. I thought would make the headset look aesthetically ugly and disrupt the communication of the SNES design.



Materials

The headset frame is made from a hard but bendable plastic. It is a similar plastic to the one featured on the original SNES controller to keep it as authentic as possible. I would also only use plastics from a credible source that can be reused or recycled because with the environmental issues today, the world does not need another product that will eventually become waste material in the Ocean.

Illumination

The illumination on my SNES headset served 2 purposes:

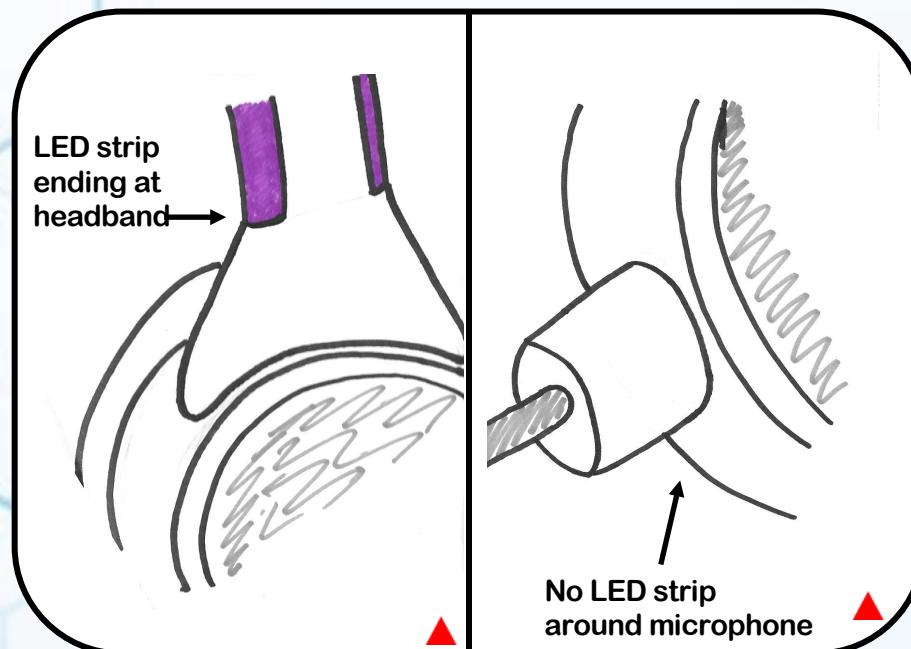
1. To add to the retro aesthetic by creating an 80s neon gaming atmosphere, and
2. To provide functionality in the lighting up upon the headset being turned on and flash upon connection.

The Illumination Problem

One problem I had was the addition of the LED lights. They were a feature I really want to include as I think it adds to the aesthetic without taking away from the communication of the SNES design. I originally wanted the lights to go all of the way around the perimeter of the headset going across the headband and around the ear piece, however since the addition of the fixed microphone it wouldn't be a complete perimeter. I also realized it would take away focus from the features on the side, as well as potentially being in the eye line of the user affecting their gaming experience.

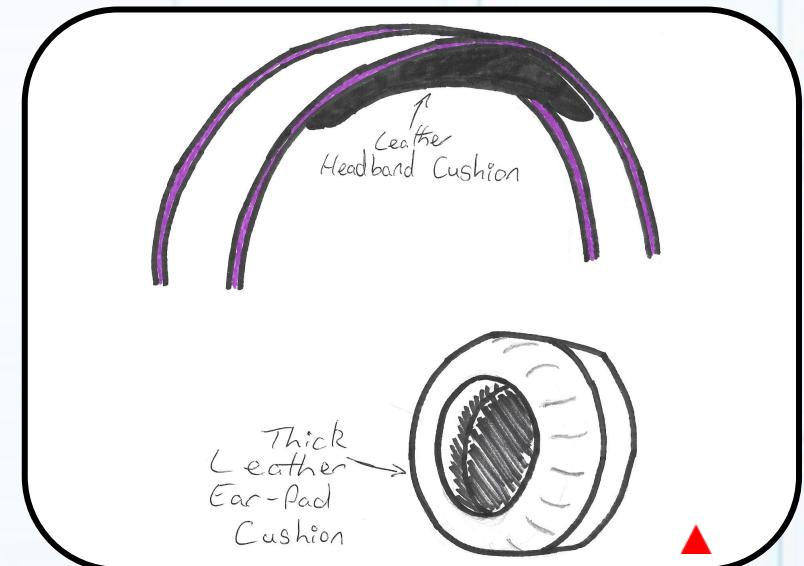
SOLUTION:

I decided to instead leave the LED light going across front and back of the headband only without going around the ear cup. Therefore still adding the same atmosphere and functionality without interfering with the microphone or the user.



Comfortability

My thought process for my SNES headset was to make the headset into the most comfortable one that I would like to play videogames in for long periods of time. Having worn both headset that I compared and headsets that I've had in the past I know the I am most comfortable with the headband leather cushion featured on the Turtle Beach XL1 and with leather over-ear ear cups. Therefore this is what I featured on my SNES headset.

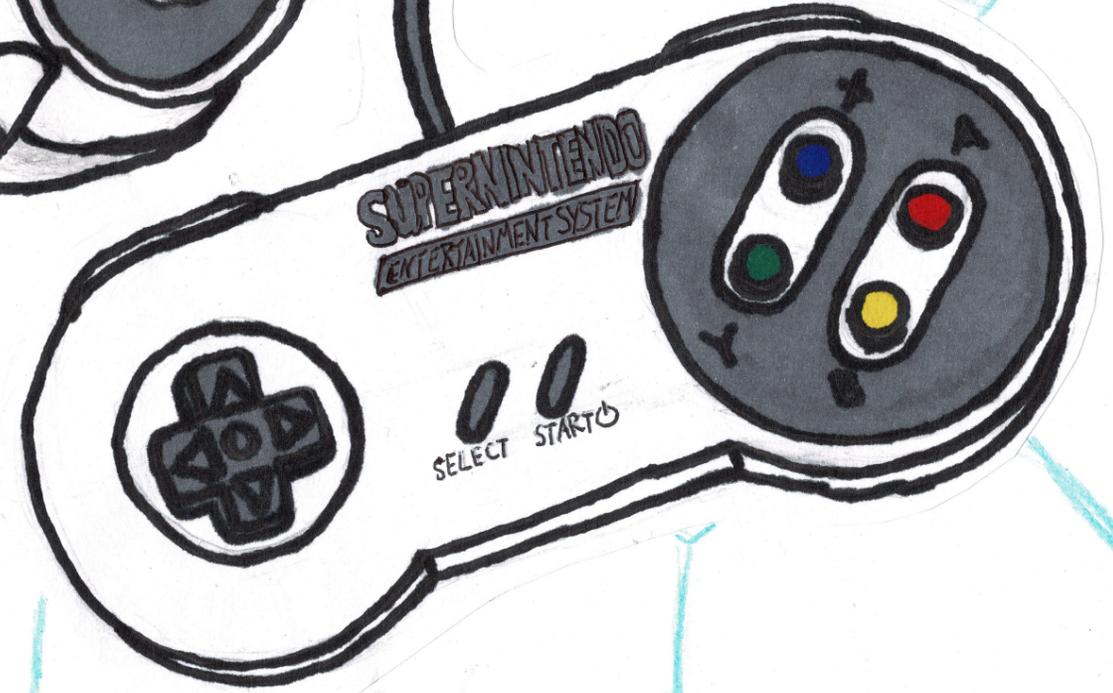
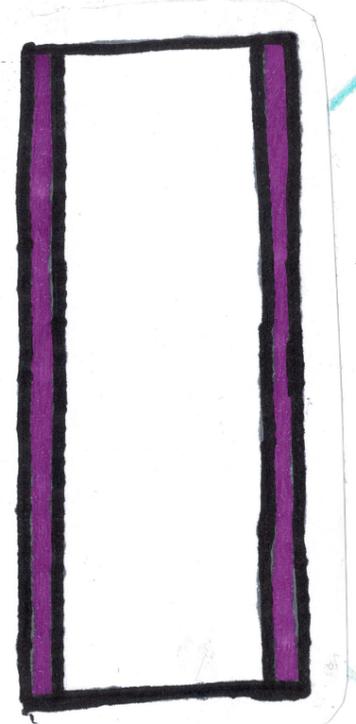


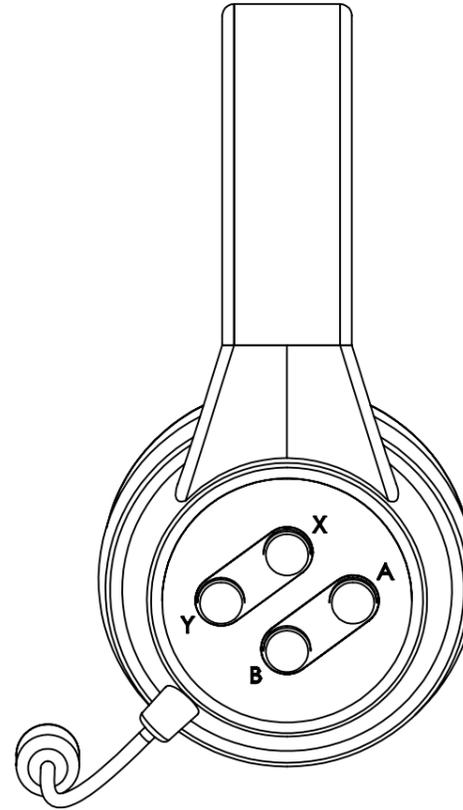
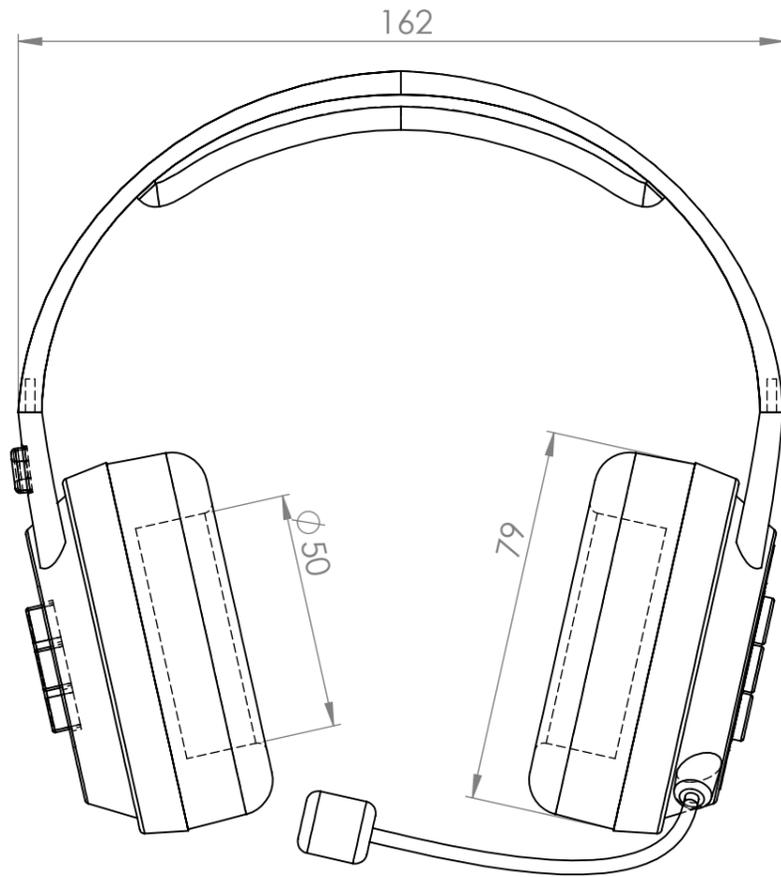
Connectivity

I decided to make the headset wireless connecting to the respective console via Bluetooth. As I showed in the compare and contrast output, a wireless headphone makes the most ergonomic sense making the experience the most enjoyable it can be to the user by giving them the most free head movement, the ability to sit as far from their screen as they wish and no unnecessary tangling of wires. Therefore it wasn't difficult to decide to make this headset wireless especially with the availability of this technology today.

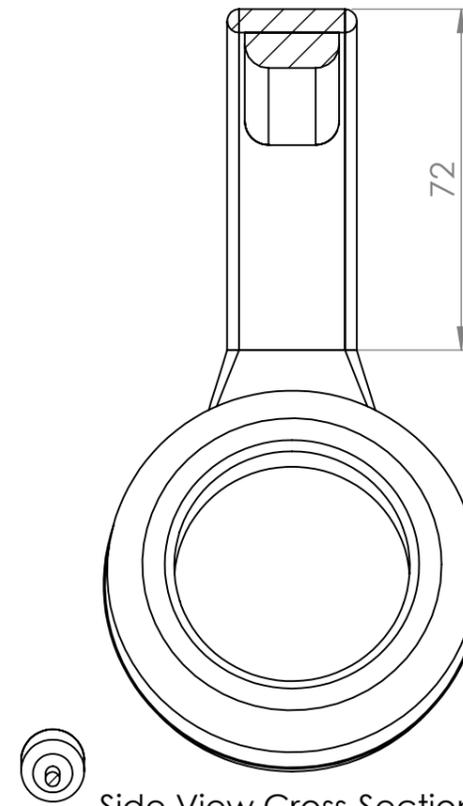
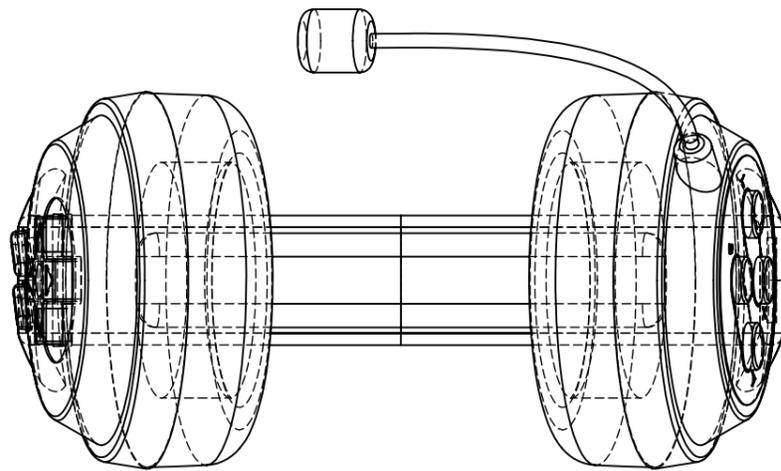
Adjustability/Foldability

I included adjustable height on the headband as it makes it more comfortable for people with large heads, a problem I know all too well.

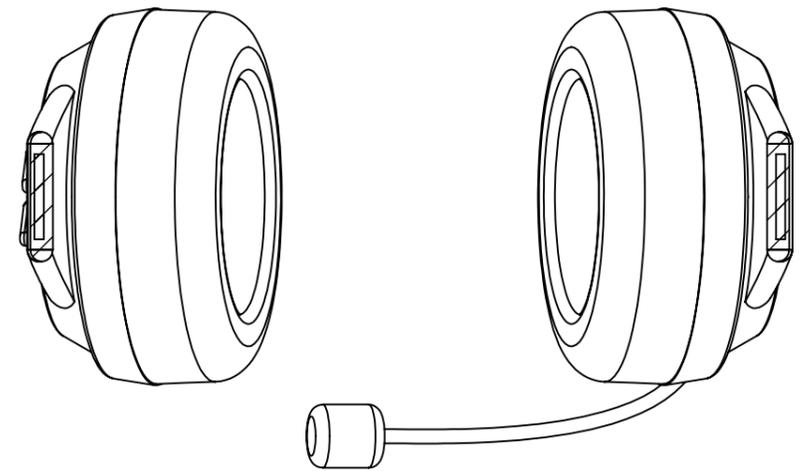




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2	Ear Pad Anchor-Right	1
3	Ear Pad-Left	1
4	Ear Pad Anchor-Left	1
5	Main Headband	1
6	Headband LED Front	1
7	Headband LED Back	1
8	Headband Anchor Right Attached Microphone	1
9	Headband Anchor-Right	1
10	Controller Button-A	1
11	Controller Button-B	1
12	Controller Button-X	1
13	Controller Button-Y	1
14	Controller Button-Start	1
15	Controller Button-Select	1
16	Controller Button-Back	1
17	Headband Cushion	1



Side View Cross-Section



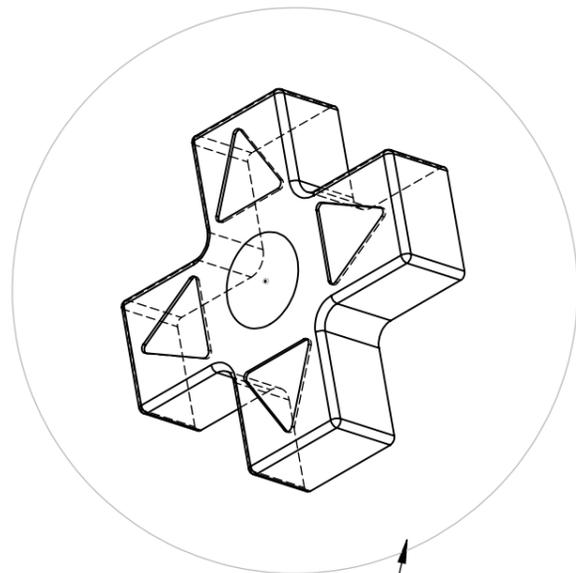
Aerial View of Ear Pieces Cross-Section

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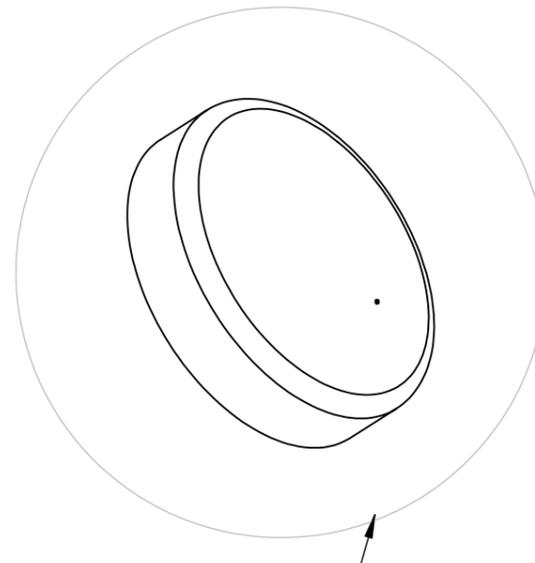
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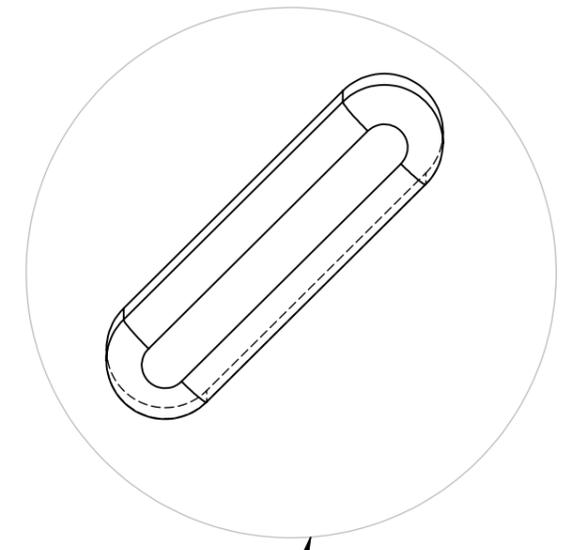
Exam Number: 106502



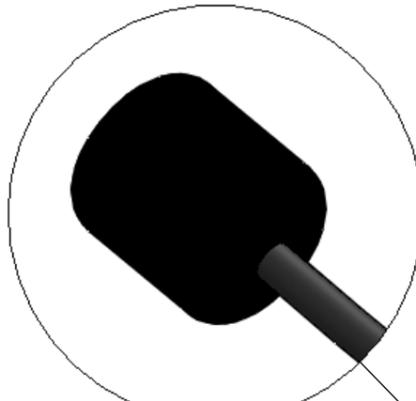
SNES Controller Pad



SNES Controller Button

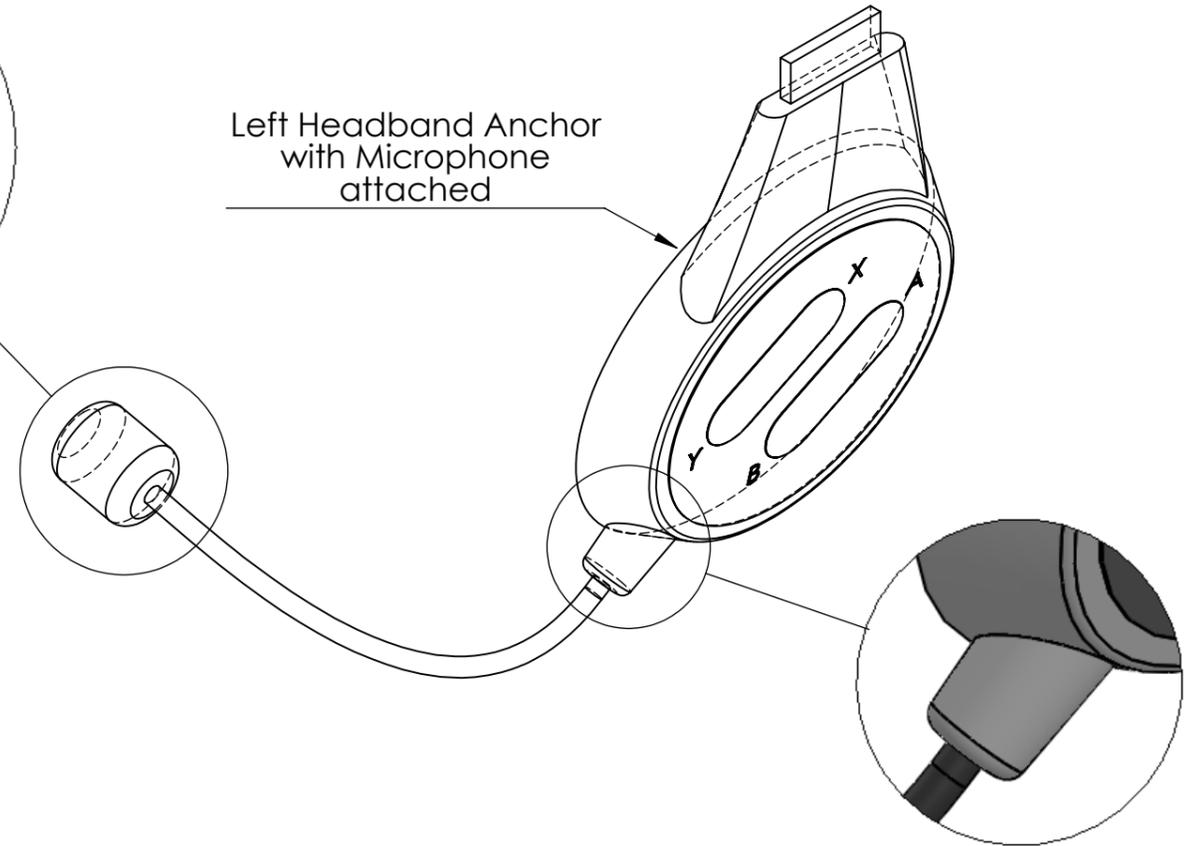


SNES Start/Select Button

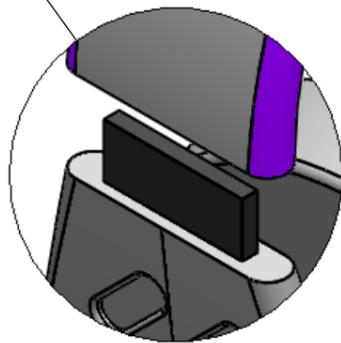


Microphone Sponge

Left Headband Anchor with Microphone attached

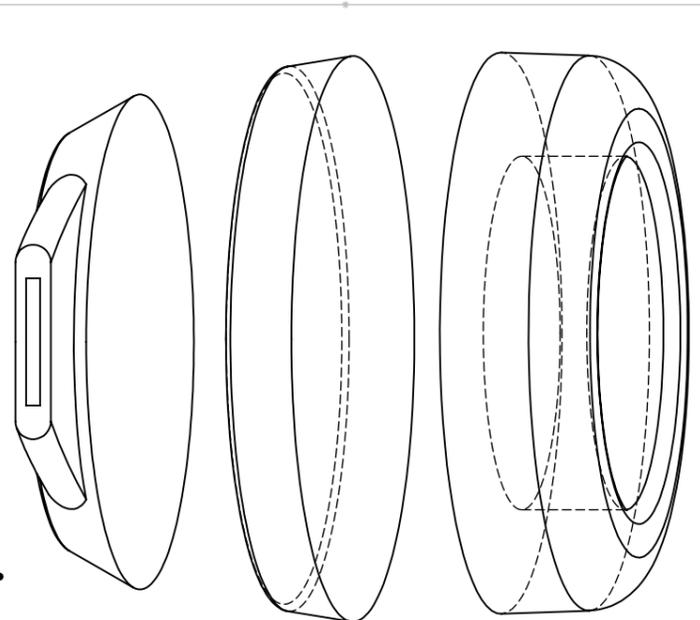


Fixed Microphone Attachment

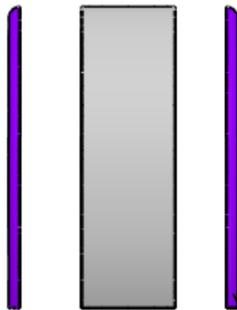


Headband Adjuster

Exploded Ear Piece



L.E.D. light strips (front and back)



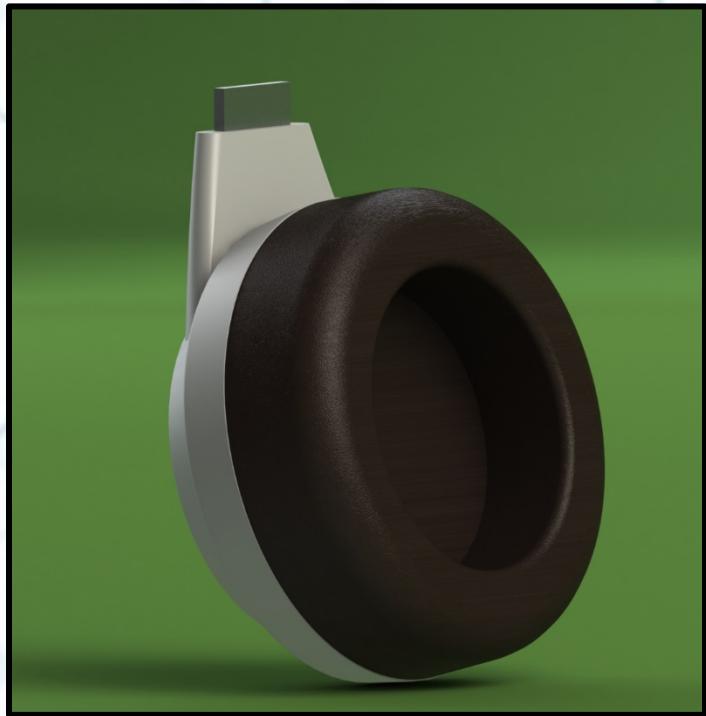
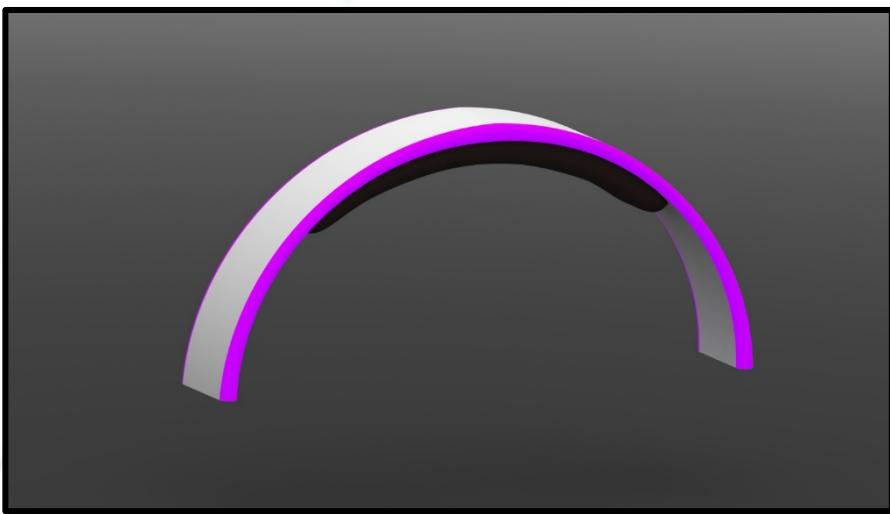
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Output 9

Scale: 1:1-2:1

Exam Number: 106502

Output 9: Photorealistic Images



Reference Page

- <https://www.wired.com/gallery/best-gaming-headsets/>
- <https://www.stuff.tv/features/headphones-complete-history>
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- <https://www.limelight.com/resources/white-paper/state-of-online-gaming-2018/>
- <https://support.turtlebeach.com/hc/en-us/articles/222956908-XL1-Specifications>
- <https://versus.com/en/kingston-hyperx-cloud-alpha-vs-kingston-hyperx-cloud-ii>
- <https://versus.com/en/search?q=kingston%20hyperx%20cloud%20ii%20vs%20turtle%20beach%20xl1>

- **Primary Research marked by ▲**