



UNIVERSITY OF
PORTSMOUTH

SIGNAL CORE

Illustrated Design and Development Portfolio



A Cyberpunk-Inspired
Wrist-Worn Screenless
Emergency Beacon



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CT7DAPPR | Digital and
Physical Prototyping



STAY ALERT
STAY ALIVE

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Project Overview

Core Idea

Signal Core is a wrist-worn, screenless emergency beacon designed for panic, injury, danger, and unsafe situations.

Three Physical Moving Parts

- Side Release Buttons
- Pop-Open Protective Lid
- Rotating Mode Knob

When Activated

The LEDs blink in SOS Morse code and the speakers output an SOS sound to help nearby people locate the user.



Core Interaction: PRESS → OPEN → TURN → SIGNAL

Initial Proposal

The project started as a forearm-worn screenless emergency beacon.

The first idea focused on emergencies where phones and touchscreens may fail.

Early Concept Features:

- Forearm-Worn Wearable
- No Screen
- Physical Activation
- Emergency Mode Selector
- Light-Based Signalling
- Designed for Danger and Medical Situations

Key Idea Kept: Emergency interaction should happen through physical movement, not screen menus.



The Problem

Phones are **useful**,
but they can become
difficult to use during
emergencies.

Emergency Problems:

- Panic Reduces Precision
- Phone May Be Lost, Locked, Broken, Or Out of Battery
- Injured Users May Not Speak Clearly
- Darkness, Rain, Smoke, Or Crowds Reduce Visibility
- Menus And Apps Can Slow Down Emergency Action
- Taking Out A Phone May Be Unsafe in Danger

Design Response

Signal Core uses a simple physical sequence:

PRESS → OPEN → TURN → SIGNAL

Early Forearm Concept

The first design direction was a larger forearm-mounted emergency beacon.

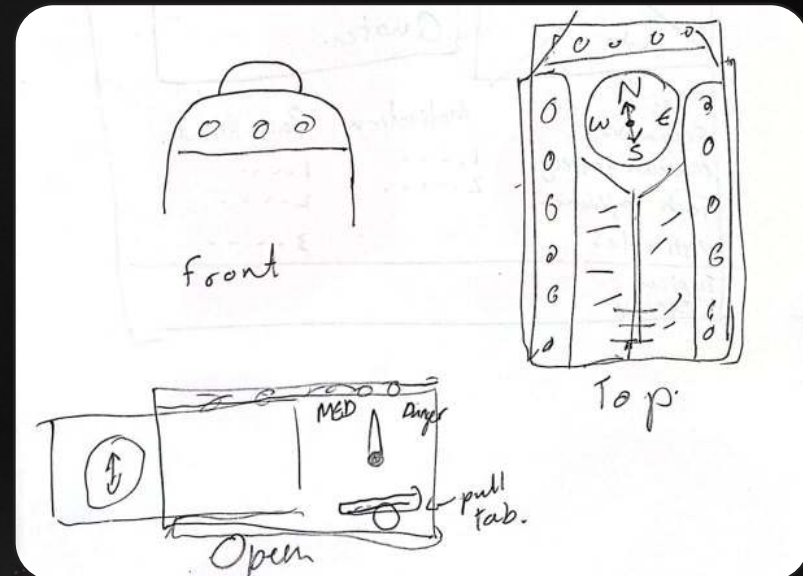
This gave more space for LEDs, speakers, and internal components, but it created comfort issues.

Design Response

The concept needed to become smaller, more wearable, and more realistic.

Problems With The Forearm Concept:

- Too Bulky
- Could Trap Heat
- Uncomfortable For Long Use
- Could Restrict Arm Movement
- Less Familiar Than A Wrist Device
- Looked More Like A Sci-Fi Prop Than A Believable Product



Inspiration

The final design was inspired by cyberpunk wearable technology, especially the **Cyberpunk 2077 x Błonie T-2077** watch. The visual mood also takes influence from **Cyberpunk: Edgerunners** through its neon city atmosphere and body-worn technology.

Inspiration Taken:

- Compact Wrist-Worn Shape
- Premium Cyberpunk Style
- Metallic Surfaces
- Futuristic But Believable Design Language
- High-End Watch-Like Appearance
- Balance Between Sci-Fi And Real-World Product Design



Signal Core does **not** copy the watch. It uses the **same design lesson**: a cyberpunk wearable can be compact, premium, and believable.

Design Change: Forearm to Wrist

The biggest design decision was changing Signal Core from a forearm-worn device to a wrist-worn device.

The forearm version had more space, but it could become warm, bulky, and annoying during long use.

Why wrist-worn is better:

- More Familiar To Users
- Easier To Wear For Longer Periods
- Less Bulky
- Less Heat And Discomfort
- Easier To Access With The Opposite Hand
- More Believable As A Real Wearable Product
- Better Match With The Cyberpunk Watch Inspiration

Design outcome:

Signal Core became more compact, wearable, and product-like.



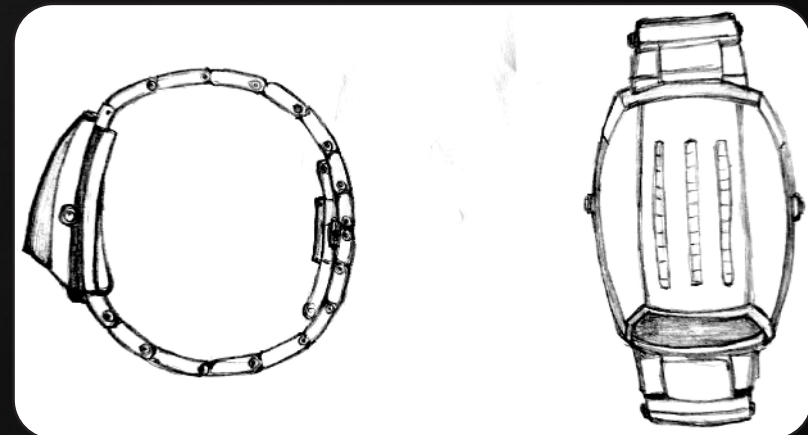
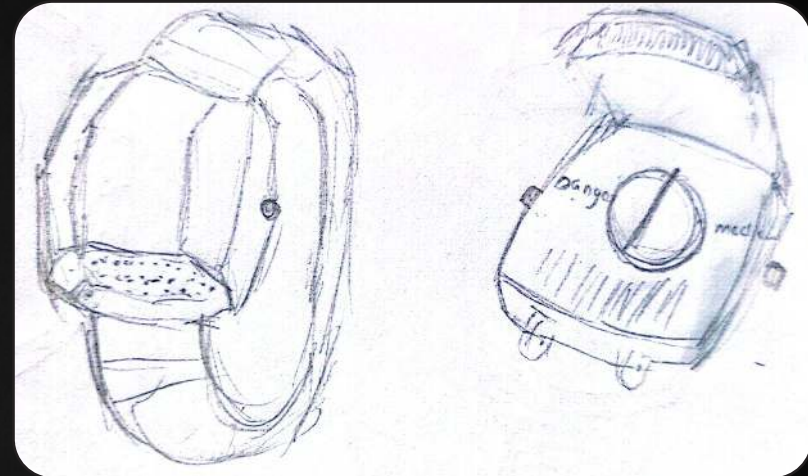
Final Design Direction

These sketches show the final design direction before 3D modelling. At this stage, Signal Core had changed from a forearm-worn emergency beacon into a **compact wrist-worn** device.

Signal Core is not a smartwatch. It has **no screen, app menu, or text interface**. It is controlled through physical movement.

Final Features:

- Wrist-Worn Casing
- Side Release Buttons
- Pop-Open Protective Lid
- Rotating Internal Knob
- Danger and Medical Modes
- LED Strips for SOS Morse Code
- Speaker Grille for SOS Sound
- White Strap
- Premium Cyberpunk Appearance



Body Location & Ergonomics

Signal Core is worn on the wrist because this position is easier, more familiar, and more comfortable than the original forearm design.

The user can activate the device with the opposite hand without removing it.

Ergonomic Points:

- Compact Watch-Like Form
- Rounded Edges For Comfort
- Side Buttons Reachable With Opposite Hand
- Knob Large Enough To Turn Under Stress
- Lid Opens Without Blocking The Hand
- Strap Keeps The Device Secure
- Suitable For Walking, Hiking, Or Emergency Travel



Three Moving Parts

01.a Side Buttons

Pressed to release the lid.
Purpose: prevents accidental activation.

02 Pop-Open Lid

Opens after the side buttons are pressed.
Purpose: protects the emergency knob.

03 Rotating Knob

Revealed under the lid and turned to choose the mode.
Purpose: allows screenless mode selection.

01.b Side Buttons

Pressed to release the lid.
Purpose: prevents accidental activation.



Emergency Modes

DANGER MODE

Used For:

Immediate Threat
Unsafe Situations
Being Followed
Being Trapped
Urgent Distress

Output:

SOS Mayday Signal,
LED SOS Morse Code,
Urgent Blinking,
Speaker SOS Sound.



MEDICAL MODE

Used For:

Injury
Illness
Inability To Move
Needing Medical Help

Output:

SOS Mayday Signal,
LED SOS Morse Code,
Speaker-Based SOS
Sound.

Interaction Flow

01

Closed State

The device is worn on the wrist with the lid closed.

03

Lid Opens

The protective lid pops open.

05

SOS Activates

LEDs blink in SOS Morse code and speakers output SOS sound.

02

Press Buttons

The user presses both side buttons.

04

Turn Knob

The user rotates the knob to Danger or Medical.

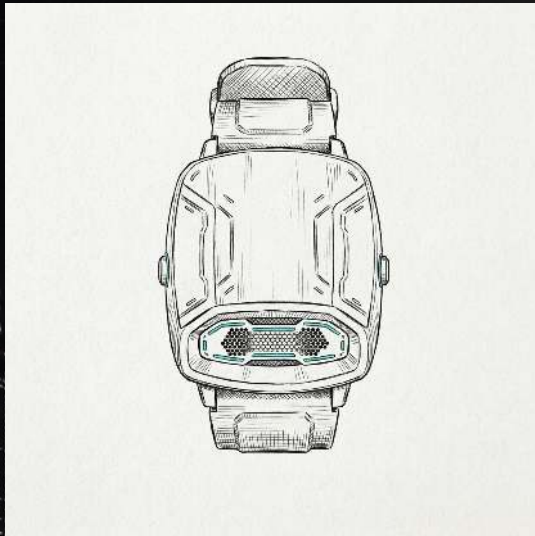
06

User Located Nearby

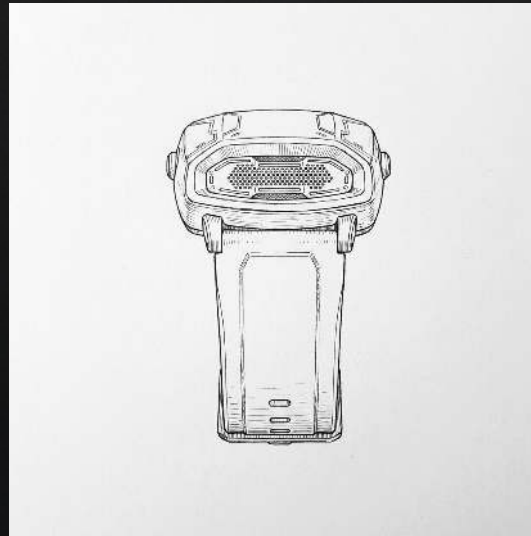
The light and sound help nearby people notice the user.

Modelling Reference Views

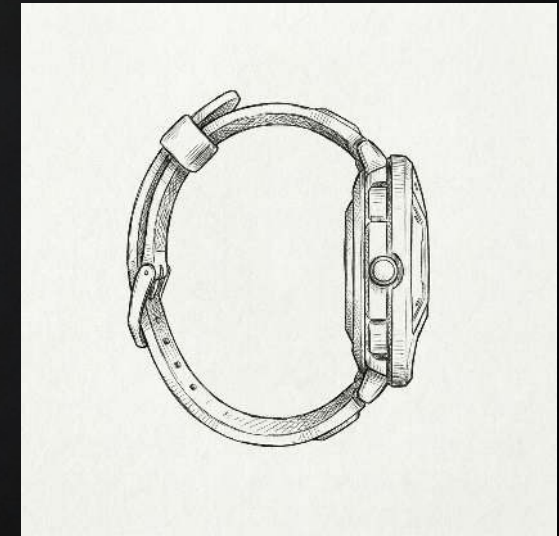
Top View



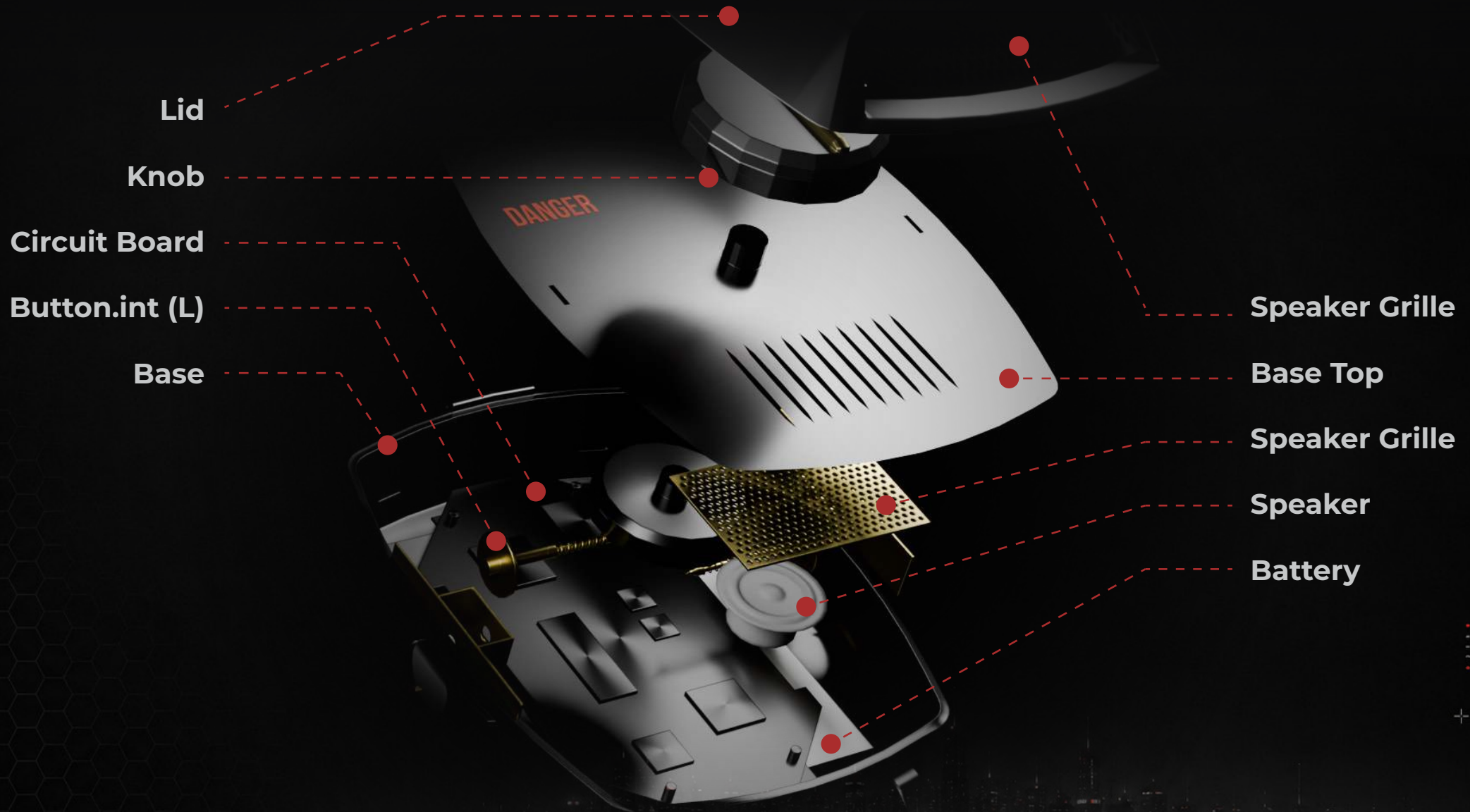
Front View



Side View



Exploded Construction



Technical Development

Software Used

3ds Max

Used for modelling the hard-surface product.

Blender

Used for animation, lighting, rendering, and final video output.

3ds Max Modelling

The model was built from separate components so the buttons, lid, and knob could be animated later.

Techniques Used:

- Primitive Block-Out
- Editable Poly Modelling
- Bevels & Chamfers
- Boolean Cuts for Speaker Holes & Recesses
- Separate Objects for Moving Parts
- Pivot Setup for Lid And Knob
- Material Separation

Main Challenge:

Balancing compact wrist size with all required features.

Animation & Sound Design

Blender Animation

After modelling in 3ds Max, the model was taken into Blender for animation and rendering.

Final Video Output

- Duration: 60 Seconds
- Frame Rate: 24 fps
- Total Frames: 1440 Frames

Animation Sequence

- Closed Hero View
- Slow Product Rotation
- Side Buttons Press Inward
- Lid Pops Open
- Knob Is Revealed
- Knob Rotates To Danger / Medical
- Exploded View Reveals Internal Components
- Final Product Rotation

Sound Design

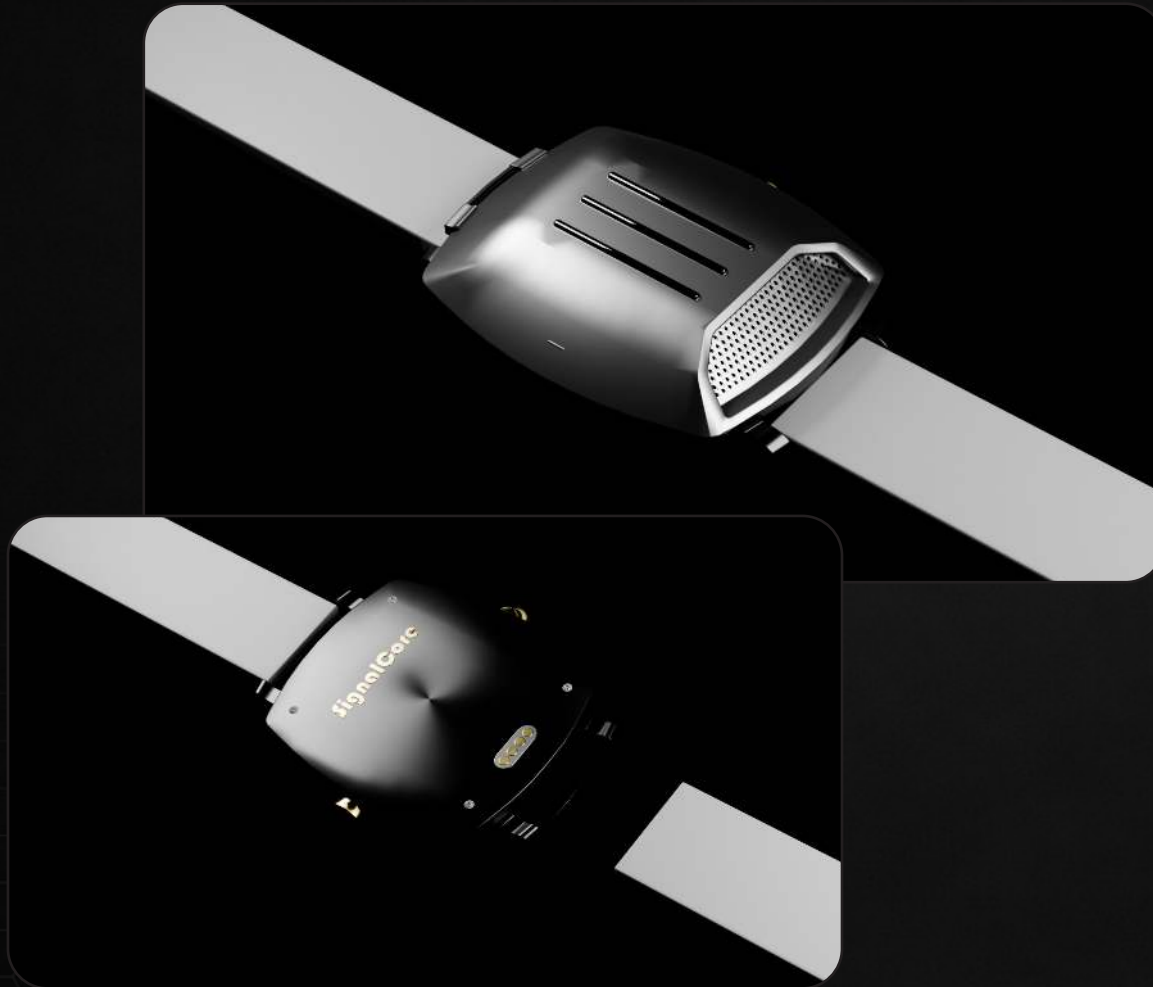
Main music:

All I Want Is U (Instrumental Version) - Snake City

Sound design purpose:

- Cyberpunk Mood
- Emergency Ambience
- Mechanical Button Clicks
- Lid Opening Sound
- Knob Rotation Effects
- SOS Alert Feeling
- Professional Product-Demo Quality

Final Model & 3D Print Prototype



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Appendices

Appendix A: Creative Idea Template

Film / Game Overview

Inspired by Cyberpunk 2077 and Cyberpunk: Edgerunners, where wearable technology, survival tools, and body-integrated devices are part of everyday life.

Signal Core is designed as a compact cyberpunk emergency device that could exist in this kind of futuristic urban world.

Goals and Objectives

Design a screenless emergency signalling device controlled through physical movement.

Core sequence:
PRESS - OPEN - TURN -
SIGNAL

The final design needed to be wearable, believable, cyberpunk-inspired, and have moving parts.

Message and Tone

Cyberpunk. Urgent. Premium. Mechanical. Survival-focused.

The product should communicate personal safety, emergency readiness, compact wearable technology, and physical reliability.

Deliverables

- Final 3D Model
- Physical 3D Print
- Prototype Images
- Exploded Construction View
- 60-Second Rendered Animation
- Epidemic Sound Soundtrack & SFX

Inspirational Objects

- Cyberpunk 2077
- Cyberpunk: Edgerunners
- Błonie T-2077 Watch
- Emergency Beacons
- Tactical Wearables
- Smartwatches
- LED Safety Lights
- Speaker Grille Designs

The Problem

Phones and touchscreens can be hard to use during panic, injury, danger, or low visibility.

Signal Core responds with a simple physical emergency action: press, open, turn, signal.

Target Audience

- Hikers
- Solo Travellers
- People Walking Alone At Night
- Outdoor Workers
- Older Adults Living Alone
- Disabled Users Needing Fast Help
- Cyberpunk Couriers Or Travellers

Timeline vs Scale

The project changed from a forearm-worn concept into a wrist-worn emergency beacon. The final outcome is a visual and physical prototype, focused on form, interaction, moving parts, cyberpunk style, animation, and presentation.

Appendices

Appendix B: Creative Persona Template - Name: Sam Peters

Motivations & Behaviour

- Stay Safe While Travelling Alone
- Act Quickly During Emergencies
- Use Reliable Wearable Tools
- Avoid Complicated Screen Menus
- Carry Compact, Practical Equipment

Pain Points & Challenges

- Low Visibility At Night
- Travelling Through Unsafe Areas
- Injury Risk While Walking Or Hiking
- Phone Use Becomes Difficult During Panic
- Touchscreens Are Slow Under Stress
- Bulky Forearm Devices Feel Uncomfortable

Demographics

- **Age:** 28
- **Gender:** Any / non-specific Alien
- **Race:** Human
- **Location:** Near-future cyberpunk city and outdoor routes

Biggest Fears

- Being Injured Alone
- Being Followed Or Trapped
- Getting Lost
- Phone Failure During Emergency
- Nobody Noticing Them
- Safety Devices Being too slow

Status

- **Education:** Technical college / self-trained route mapper
- **Occupation:** Independent courier and outdoor route mapper
- **Annual Income:** Medium / unstable freelance income

Communication Channels

- Mobile Phone
- Messaging Apps
- Voice Calls
- Maps And Navigation Apps
- Wearable Alerts
- Local Audio / Visual Signals

Devices

- Smartphone
- Wireless Earbuds
- Torch
- Compact First-Aid Kit
- Power Bank
- Wearable Watch / Fitness Device
- Signal Core Emergency Beacon

Physical Considerations

Sam needs Signal Core to be wrist-worn, compact, comfortable, easy to activate with the opposite hand, usable without reading a screen, secure during movement, and not too warm or bulky.

Design Impact:
These needs influenced the change from a forearm-worn concept to a wrist-worn design.



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Thank you

Any Questions? Contact - up2544337@myport.ac.uk