

Transceiver for First Responders

Instant & Reliable
2-Way Communication
in demanding situations

Operation with gloves

Easy button access even with thick gloves

Military-Grade Shockproof

Shell can withstand great impacts and falls

Fire-Resistant & Heatproof

Operate perfectly in extreme heat

Waterproof: IP67

Operate perfectly when emersed in water

Dust Sealed

Completely sealed to small particles



How to use:



Push to talk:

Press the rear button to switch from listening to talking.



Switch Channels:

Press the top button with your thumb to change frequency.



Talk to Everyone:

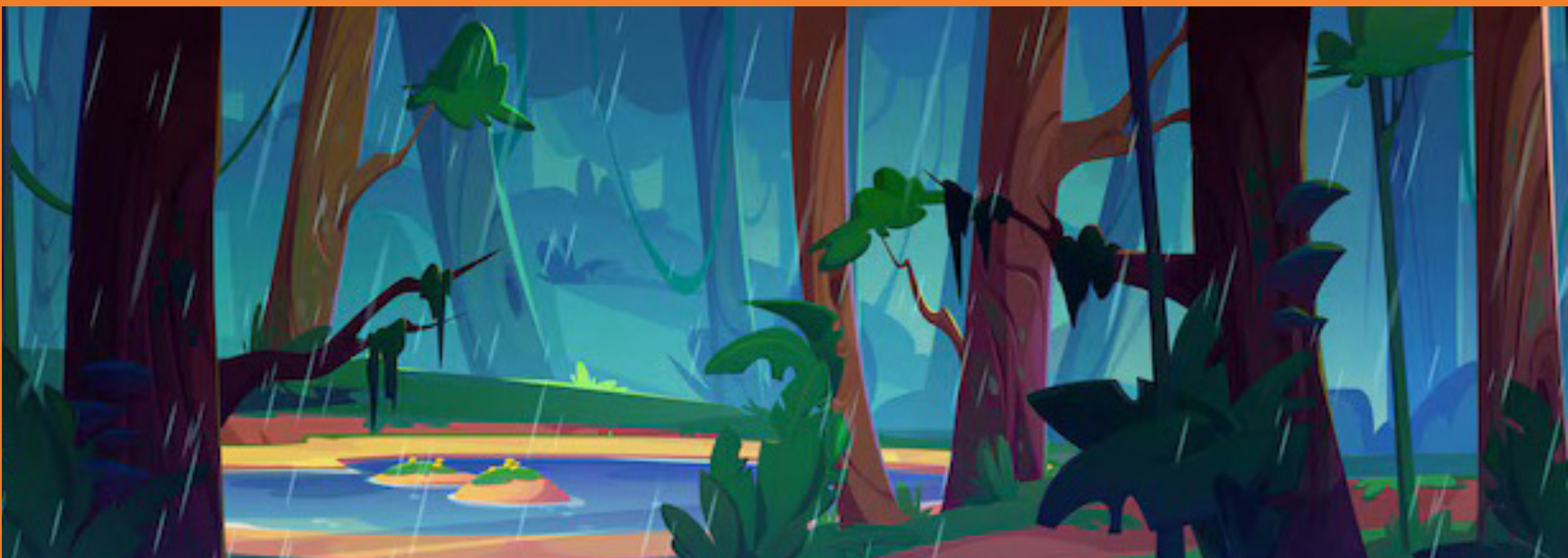
Press and hold both buttons simultaneously to talk to all channels.



Re-Charging

Place on a wireless induction charging pad (this ensures a complete seal).

Fast & Efficient Communication in time constraint situations



Primary Users

The primary users are emergency and safety personnel, including:

- Firefighters
- Paramedics
- Police officers
- Search & Rescue



The buttons on this walkie-talkie have been designed specifically to enable rapid functionality in a single hand.

Evaluation

Focus Group Findings:

+ Ergonomic:

Users found the button placement ideal and prefer the feel in hand compared to traditional walkie-talkies.

> Satisfies the need for quick communication

+ Intuitive:

The users instantly understood the functions of the buttons and found it easy to press both at the same time.

> Universal design, suitable for all without training.

- Lack of Control:

Some users suggested additional features such as volume control, alert sounds and potentially an integrated flash light.



Foam Prototype



3D Printed Prototype

Title

Fast Communication

Description

Use of the different modes quickly on one hand

User Needs

Time constraint situations

Evaluation Method

Focus group tests

Score

10/10

Priority

High

Durability

Withstand drops, moisture, temperature, and dust.

Reliable performance in all settings

(Testing under simulated extreme conditions)

(8/10)

High

Simple UI

Easy to navigate, accessible buttons.

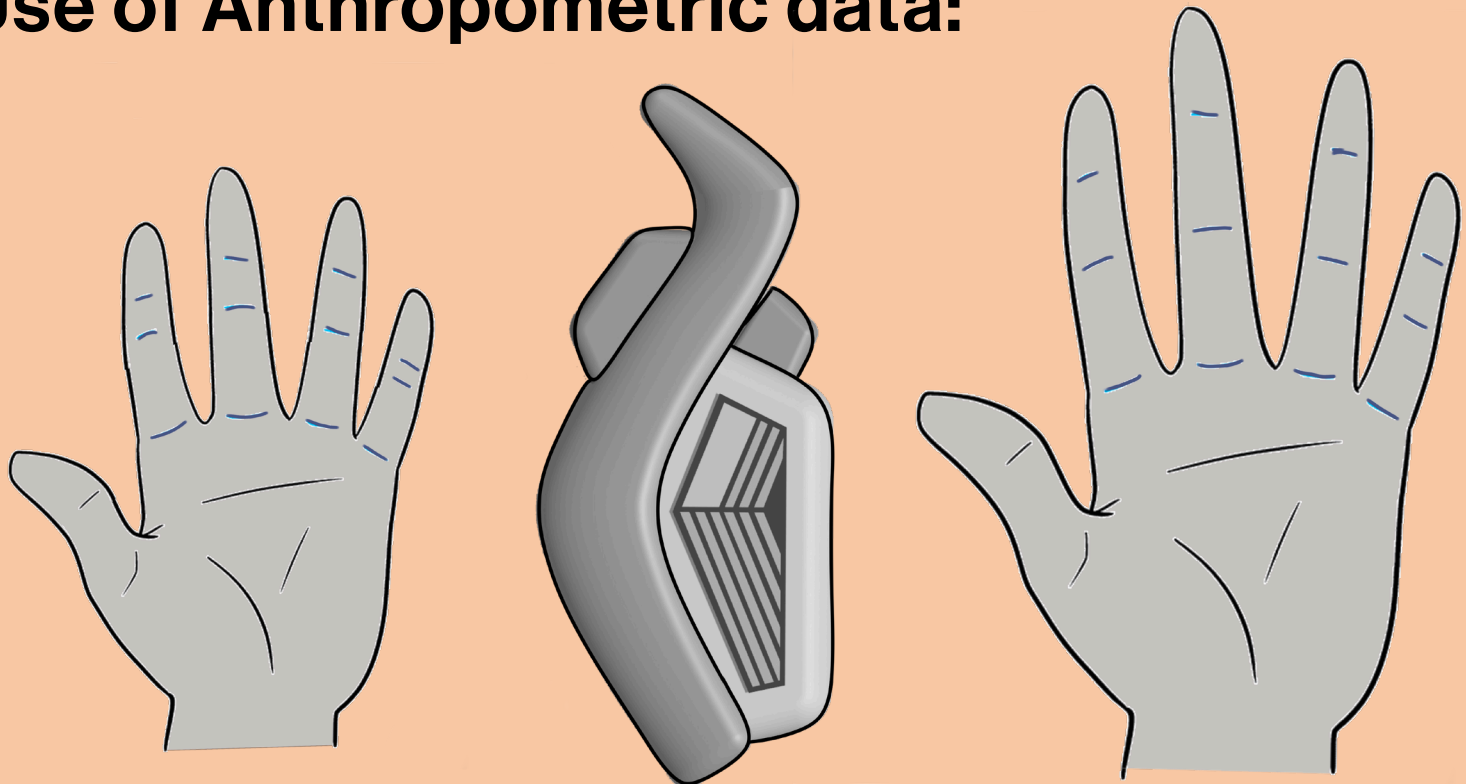
Ease of use under stress

Usability testing in simulated tasks

10/10

High

Use of Anthropometric data:



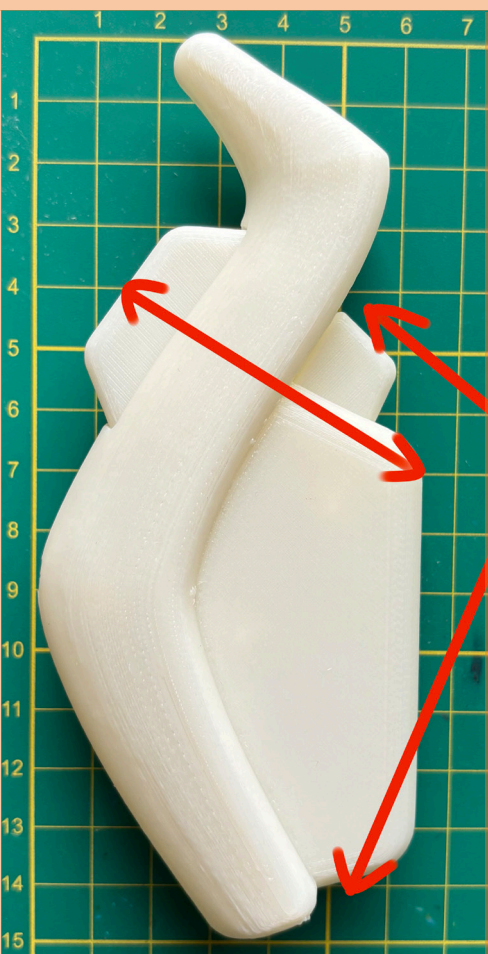
1st percentile smallest (woman)

99th percentile largest (man)

Dreyfuss, H. (2002). The Measure of Man and Woman: Human Factors in Design. Whitney Library of Design.

- Thumb length
- Grip circumference
- Index finger length
- Grip width

(A slightly smaller body combined with larger buttons was finalised in order to maximise compatibility with all hand sizes)



Height:
14.cm

5.5cm

3cm

8.5cm

Shell: 3.2cm
Main: 2cm

Conclusion:

The size, ergonomics and intuitiveness from the requirements are fully satisfied. This was my primary goal when designing the 3D printed model.

Next steps:

Integration of more features that can respond to more varied needs of emergency services (Without impacting ergonomics or intuitiveness)

- **Emergency Alert button:** When in dangers, location tracking
- **Flash-light on top shell:** For smoke visibility and crowd control

Safety / Security teams:

- **Volume control:** For stealth / confidentiality
- **Stopwatch:** For surveillance and incident documentation

Other:

- **Thermometer:** For Ski patrol or other users in extreme climates

Appendix

Other Requirements:

The Requirements that the prototype cannot test
i.e. Battery life, Audio Quality, Connectivity and Security

Title	Description	User Needs	Evaluation Method	Source	Priority
Durability	Withstand drops, moisture, temperature, and dust.	Reliable performance in all settings	Laboratory testing under simulated extreme conditions	Review of the Fire Service	High
Long Battery Life	Operate for long periods, ideally for a 24-hour shift.	Continuous availability	Battery endurance testing in active usage	Emergency work schedules	High
Clear Audio Quality	Clear sound, even in noisy environments.	Precise communication	Decibel and clarity testing in controlled lab	User trials with others	High
Simple UI	Easy to navigate, accessible buttons.	Ease of use under stress	Usability testing in simulated tasks	Ergonomics research	Medium
Connectivity	Reliable over a wide range/ in remote areas	Consistent coverage	Field testing in rural, urban, and remote environments	Search & rescue needs	High

Anthropometric data:

1st Percentile Smallest Woman

- Thumb Length: 41 mm
- Grip Circumference: 120 mm
- Index Finger Length: 58 mm
- Grip Width: 54 mm

99th Percentile Largest Man

- Thumb Length: 72 mm
- Grip Circumference: 285 mm
- Index Finger Length: 94 mm
- Grip Width: 110 mm

Materials

