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New Zealand culture has been nurtured by exposure through travel, both from the experiences of visitors and by the relationships built by New Zealanders overseas. As a young nation, New Zealand has been cultivated by the skills and cultures it imports, inheriting a synergetic dynamic of international relationships.

Patch a system and mode of exploration that aims to adopt this synergy into a tool for all travelers to use, by compiling individual experiences into a collaborative narrative.





Exploring is an essential factor of travel and implicit to an O.E. Curiosity and inquiry are also essential to learning more about the cultures and communities that one visits. In an increasingly global society, there is a need for travel as learning. As the challenges facing the planet increasingly demand that we work hand in hand to resolve solutions, understanding and appreciation become paramount.

*"Since the rise of the "knowledge economy", many of us work in offices, behind desks, and deal with issues with which we have very little direct, face-to-face experience. This creates a disconnect between our actions and their implications. It makes it difficult for us to understand the true significance and impact of what we do, what our politicians do, and who it all affects. It also means that we have a relatively limited understanding of our planet."*

- Zoë Chafe, staff researcher at the World Watch Institute



Patch is a response to the increasing prevalence of ubiquitous technologies that, as everyday users we are building dependence on. With an increase in surveillance comes not only a loss in consumer privacy, but also an openness and unwitting complacency to interacting with what can be highly invasive or controlling systems.

As a technology, RFID has developed an impersonal, dominating presence within the user's routine of consumption, and is mostly invisible. There is potential however, for RFID systems that operate inside a dialogue with the user, whilst capitalising on the passive nature of RFID to create bodies of information and channels of interaction that are dynamic and constantly evolving. Through conscious interaction Patch seeks to bridge the gap between RFID and the portable devices that we use on a regular basis, and that already play a large role in shaping our lifestyles.





What this product and system will hope to achieve is to give visitors greater access to “word of mouth” knowledge of a city and the intimate and serendipitous experiences this creates.

Where there is some common interest that leads travelers to cross paths, Patch provides a platform for sharing experiences and building communities of explorers.

# the patch system

## *Tags*

As travelers make discoveries, they mark these places with tags. When placed, these passive RFID labels become loaded with the co-ordinates of any previous tags placed before it. Cheap, disposable and biodegradable, they remain adhered for 6 – 24 months.

## *Compass*

The Patch Compass builds up a database of all the tags it comes across, and the co-ordinates they disclose. Using GPS, the compass directs travelers to places that have been tagged, updating a fresh list of co-ordinates to any tag it comes within a few meters of. If it detects a tag it wasn't expecting, it alerts the traveler that they have stumbled upon somebody else's trail.

## *Online Database*

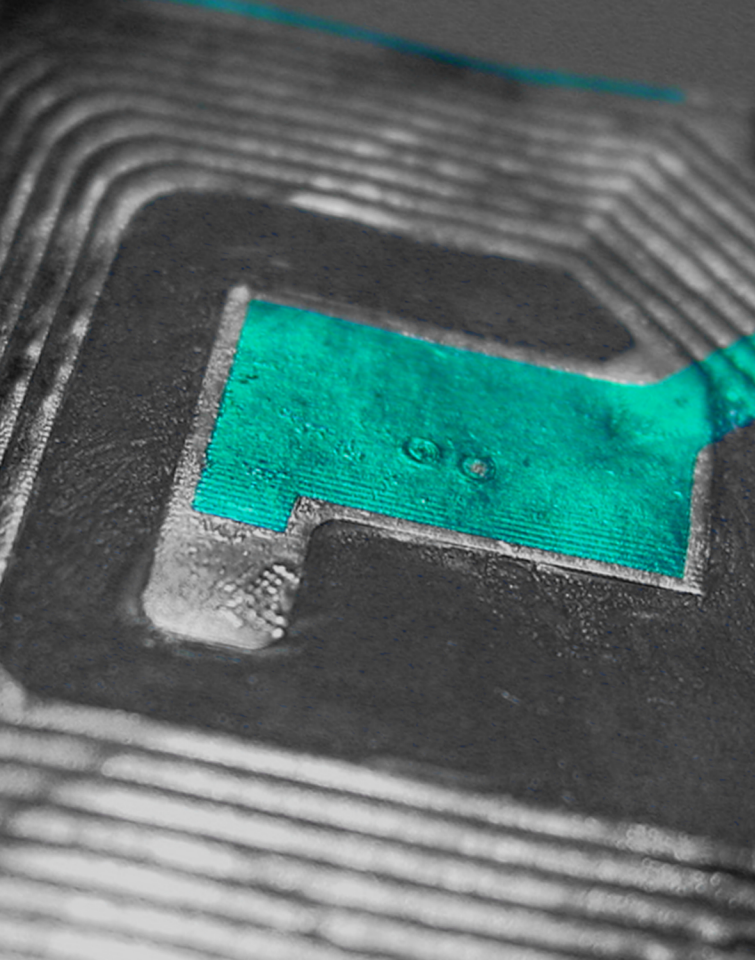
Travelers upload their discoveries to a global database where they share them with the world if they choose to. Here tags form clouds of location based comments and records of journeys. Online, the user participates in a synchronous collaborative environment, where communities share their experiences in real time.







ginza / tokyo / japan



# introduction

In 2005, Wal-Mart and the US Department of Defense announced that all of their suppliers would need to place RFID tags in all of their shipments. Because of the size of these two organisations, this has caused major change in many supply chains, and has contributed to an acceleration in the deployment of RFID systems throughout the world.

RFID technology is one aspect of ubiquitous or embedded computing - the integration of computing beyond the technological devices we are used to, and into everyday objects such as our clothing, food, housing and footpaths. Many researchers predict a massive growth in ubiquitous computing in the near future.

"Technology has only one direction - toward more power and capability -and it goes that way no matter whose interests are injured." - Robert W. Lucky, IEEE fellow.

"I think that ubiquitous computing tends towards what I call the colonization of everyday life. It has this ambition to gather every circumstance of our daily lives into it and perform that same transformational process on it." - Adam Greenfield, information architect.





Richard Stallman, wrapping his pass in aluminium foil at the 2005 wsis conference.

Most if not all of the current applications of RFID systems either operate unannounced to the consumer or in a controlling relationship where the consumer is obliged to use the system. This gives RFID a very impersonal and dominating presence that generates a great deal of fear and paranoia.

"An RFID is a tracking device. If you have an RFID, you can be tracked at any time, so they're a terrible threat to privacy rights." – Richard Stallman, software freedom activist.

A current study by researchers at the University of Washington is exploring the privacy concerns around ubiquitous RFID surveillance by setting up 100% RFID coverage within their computer science and engineering center. 150 Students and faculty will eventually be able to track one another 24 hours a day, but the system is optional, with participants able to opt in and opt out at any time. "Do users feel that the utility of an application justifies the potential loss of privacy?" was one of the questions posed by the researchers, and their early findings have convinced them that "the technology itself is not an inherent risk to privacy, or at least not in any way that can't eventually be fixed."

A similar previous study conducted at the University of California resulted in "many stories about how it created positive, serendipitous interactions".

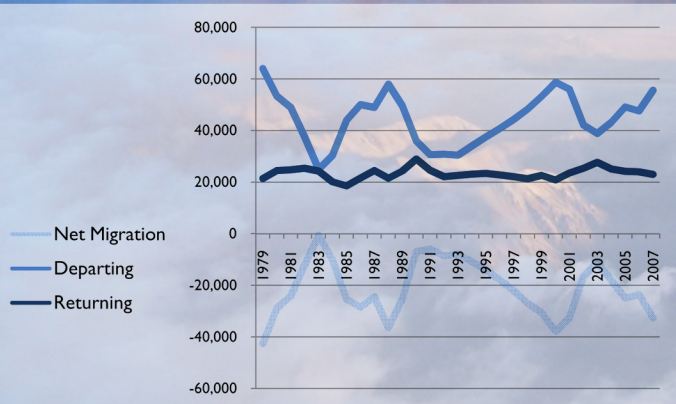


# new zealand abroad

New Zealand is a small, young island nation, far detached from the rest of the world and sovereign for only 168 years. New Zealanders have much to gain from travelling aboard and experiencing the rich history and culture of more senior nations, and there has developed a trend for them to do so. The extended overseas working holiday has become such a tradition that we have coined a special term for it, the OE.

A rough estimate from 1999 was that there were between 500,000 and 600,000 New Zealanders abroad at the time, about 14% of the total national population. Steady migration over the past 30 years has meant a brain drain of skilled workers and recent graduates, although the successes of Kiwi expats have nurtured a positive reputation for the nation. The OE has been significant in fueling the growth and evolution of New Zealand culture, with Kiwis abroad as a major aspect of New Zealand's international image as a whole.

The tradition and passion of "The OE" embodies a certain quality that would help a product or system in promoting exposure to and interaction with RFID technology, as well assist in fostering an appreciation of embedded computing and greater innovation in its use and deployment.





# existing systems



## UID Center Ginza Study

Undertaken as a feasibility study by the Japanese collaborative, the Ubiquitous ID Center, thousands of RFID tags were placed throughout a section of the Ginza district in Tokyo. These tags could be detected by dedicated portable readers that would download and display the location specific information presented by the tag.

Combining RFID with GPS and WIFI, the system was able to provide visitors with contextual information such as directions to popular destinations and nearby amenities, along with current offers at local restaurants and historical information about particular landmarks. The UID Center highlighted the ability for the system to enable people with disabilities to have greater access and freedom of movement throughout the area as well as the potential to provide highly specific location-based instruction in the event of disasters such as fires and earthquakes.

[www.uidcenter.org](http://www.uidcenter.org)



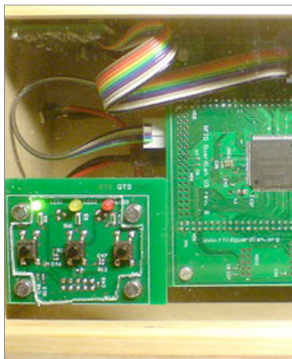
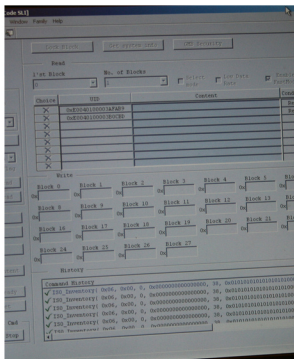
Zapped!



Zapped is an independent research project carried out by the artists and activists collective, Preemptive Media. The project aims to inform consumers about their exposure to RFID and to empower them with tools to manage their exposure.

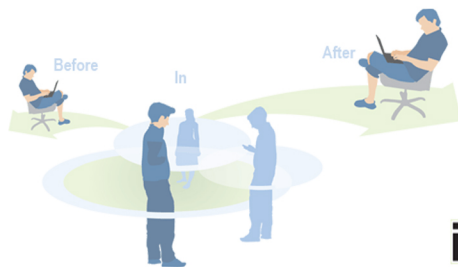
"Preemptive Media is not encouraging paranoia with Zapped!, but rather participation and preparation!"

RFID Guardian



The RFID Guardian is a collaborative open-source project to develop equipment that individuals can use to monitor and manage RFID tags on and around them. The project's goal is to provide users security and privacy in RFID systems.

Projects like Zapped! and the RFID Guardian are not strictly malicious or vindictive, as they seek to increase consumer awareness and to empower individuals by exposing the RFID activity around them and giving them control over it.



imity

A copenhagen based start-up, Imity is building tools that exploit the Bluetooth capability of mobile phones to create new networking opportunities. Pocket Radar is a system that compares user created profiles of people who are within a few meters of each other, alerting users when there may be similar interests between them. Imity places an emphasis on the contextual information of a place.

"Location is not about geography. The most important thing isn't the space you're in -- the coordinates -- but the place you're in -- the people, ideas, and interactions between them."



# social networking and privacy



"The point is that teenagers must and do disclose personal information in order to sustain intimacy, but they wish to be in control of how they manage this disclosure. As Giddens (1991: 94) says, 'intimacy is the other face of privacy'"

Social networking services such as Facebook and Orkut contain huge pools of very personal data, but do not seem to face the same public fear that confronts physical tracking systems like RFID. In fact, they depend on people's willingness to interact with them to be able to operate. Although systems such as these are providing a service to the consumer and not the manufacturer as with RFID, they do have secondary functions that are beyond the knowledge of the user such as targeted advertising. This social networking is free of charge for the user but companies utilise the massive amounts of personal information collected for financial gain.

Despite privacy concerns the number of people registering themselves on social networks has skyrocketed in recent years. "The sum total of social networks [in the UK] rivals the population of most European countries." (pg464, Social Networking Technology)

The key user confidence and openness to a system of RFID surveillance and communication could be found within the dynamics of social networking. In a study of teenagers in the UK aged between 13 and 16 and their use of the social networks Facebook, Sonia Livingstone noticed that the notion of intimacy took some precedence over privacy, but only when there was control over how much information would be disclosed.



# design brief

## Issue

Ubiquitous computing and product tracking/data collecting systems are becoming widespread in our society and are likely to be increasingly embedded into our daily routines and social lives.

With an increase in this surveillance comes a loss in consumer privacy. This fuels paranoia and fear towards the surveillance technology and inhibits the development of the technology as a tool to benefit the user and act as a catalyst for progression in society.

## Proposal

Develop a product that exploits the interactive potential of RFID as a tool for passive or active self expression of one's identity in an urban environment.

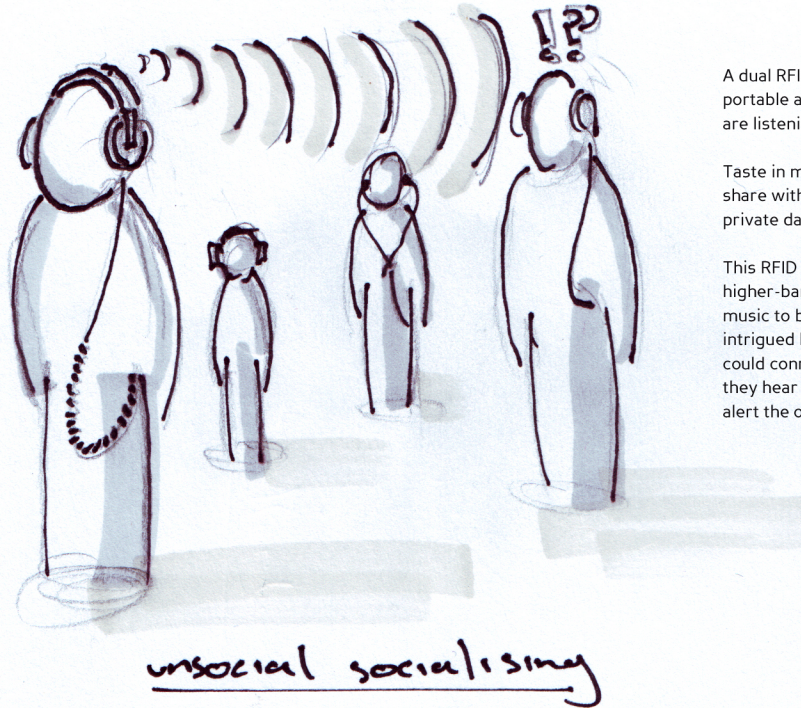
# pre-concept

## *Audio Exhibitionism*

A dual RFID reader/transmitter that connects with a portable audio device and tells other devices what you are listening to.

Taste in music is generally something people love to share with one another as opposed to more sensitive private data.

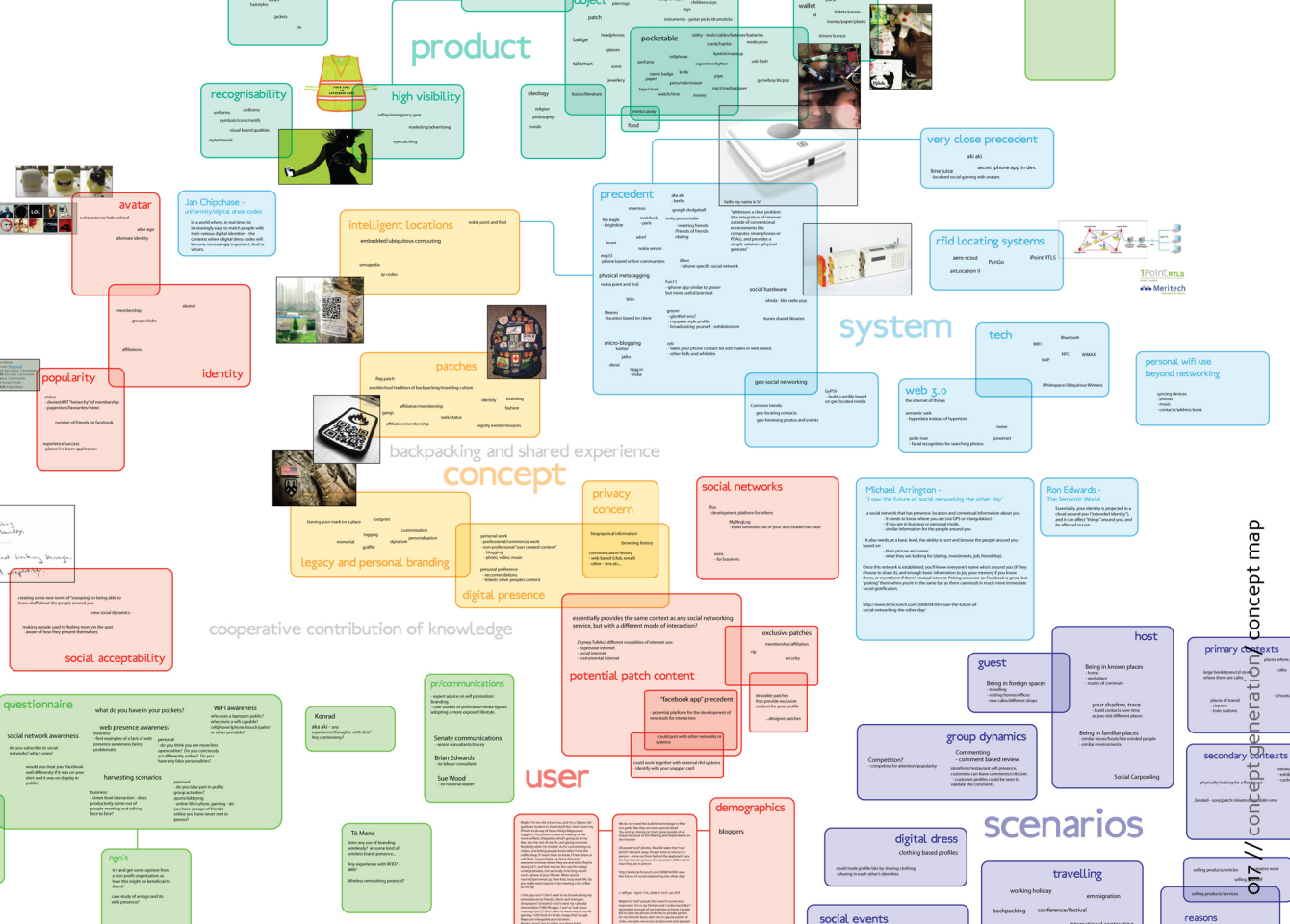
This RFID interaction could be coupled with a higher-band technology such as bluetooth to allow music to be streamed between devices. If a user was intrigued by what somebody else was listening to, they could connect wirelessly and listen in. If they like what they hear they could leave a message, or they could alert the other person and talk face to face.



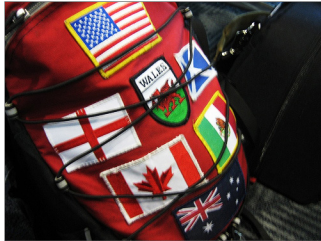




lower east side / new york / united states



# Localised webpresence and travel patches



*flag patches, military insignia and qr code 'digital' patches.*

The souvenir patches and badges that get collected and worn by travelers, become a statement of self expression and identity. The tradition of collecting flag patches becomes a conversation starter when around other travelers and is often the signifier of some common link between people.

Patches, labels or stickers are increasingly bridging physical and digital contexts. RFID tags are now invaluable to supply chain management and the advertising world has long been using two dimensional barcodes or QR codes to direct viewers to online content. There is potential for a personal system of wearable identifiers to connect ones physical presence to an online web-presence, by adapting these existing systems for personal and social use.



# patch one: rfid and wifi

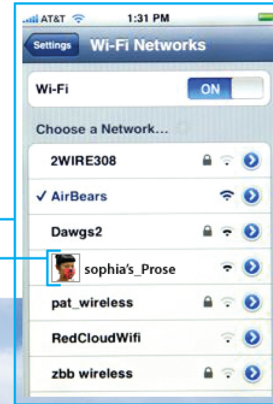
An early concept for a "device that localises somebody's web-presence around them to make them more aware about how they present themselves online".

Location positioning systems such as Aeroscout and the Meritech iPoint RTLS use RFID tags together with standard networks of wireless routers. When coupled with special software they are able to detect tags and triangulate their positions.

This use of RFID suggests an opportunity for engaging passive tags with the wifi networks that are commonplace in urban environments. This concept hypothesises the use of wifi hotspots as a way of "broadcasting"/announcing the presence of somebody wearing an rfid "patch" to anybody else in who happens to be scouring the available wifi networks.

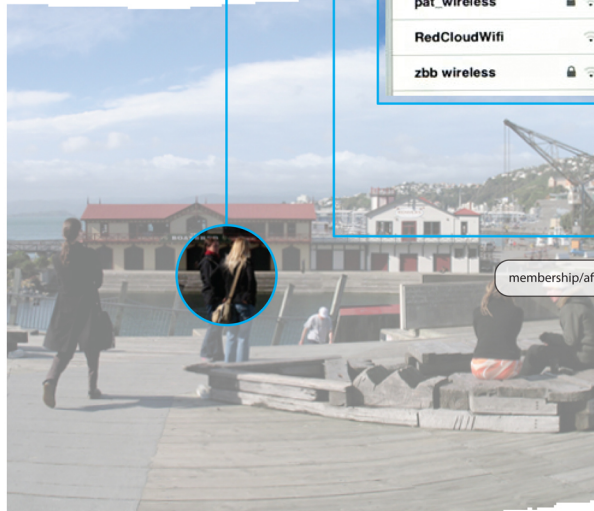
1 icon & user name  
listed alongside  
wireless networks

two people are what to check something online  
and notice a personal profile alongside the  
available wireless networks



rfid

an active rfid tag, operating at standard wifi frequencies allows it to be detected by wifi capable devices, ie: laptops, iphones, etc..



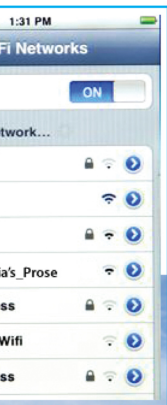
sophia+Prose

8 m away, SW

membership/affiliation



roses are red  
violets are blue  
or so john tells me  
because i'm blind



## rfid

an active rfid tag, operating at standard wifi frequencies allows it to be detected by wifi capable devices, ie: laptops, iphones, etc..

### ② provides access to a public profile

connecting through one of the networks they can view the profile online, which also tells them how far away this person is.

### ③ opportunity for interaction

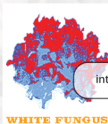
by chance, one of them is visiting from berlin where she noticed an issue of white fungus in a bookstore, and is interested in learning more about wellington poets/writers. she could go and approach this person, noticing the image on her workbook is the same as her profile icon.



sophia+Prose

8 m away, SW

membership/affiliation



intrests/social groups

roses are red  
violets are blue creative content  
or so john tells me  
because i'm blind



# patch two: dressing your digital self

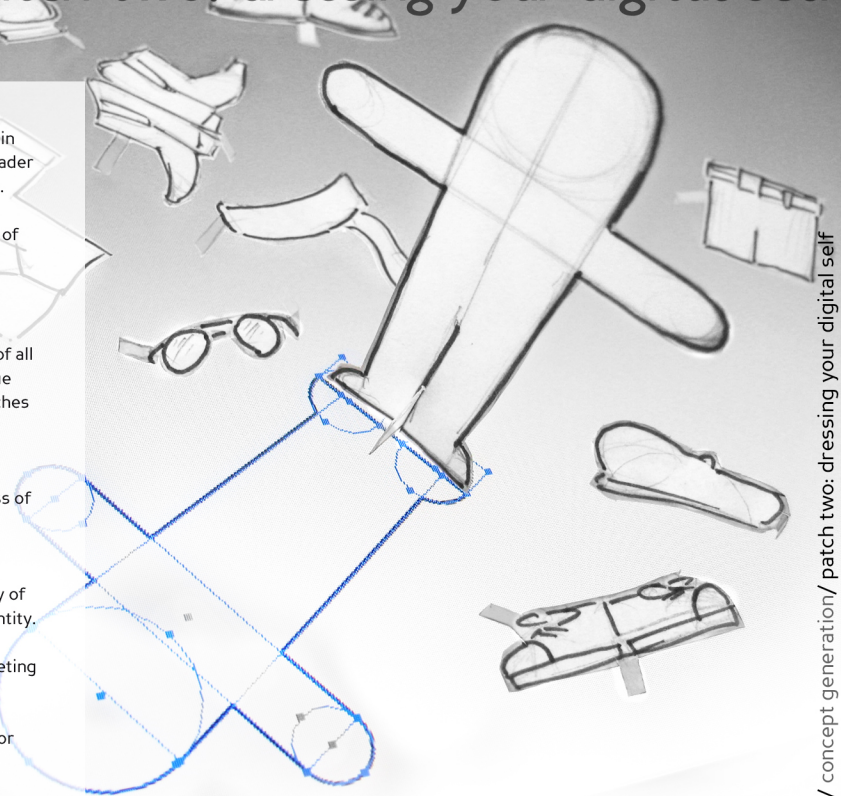
This system concept consists of patches that contain encrypted, writable passive rfid tags and an rfid reader device that also has wifi and bluetooth connectivity.

The user attaches the patches to meaningful items of clothing or personal belongings that each relate to different facets of his or her lifestyle.

The rfid reader is a small, highly portable and cherishable 'talisman', that registers the presence of all the patches the user has present and builds a unique digital profile. The user configures each of the patches to trigger different profile content, relevant to the belongings that the patch is tracking.

This product proposes to raise the user's awareness of his or her digital presence in contemporary urban environments, taking the precedent of online social networking services and creating a localised digital profile that bridges the gap between the anonymity of online interaction and one's real-world sense of identity.

In doing so it provides a tool for socialising and meeting new people based on relevant interests, promoting yourself or your work, finding employment, finding products and services, and creating new avenues for discovery





# patch three: travel and learn

This narrative explores the potential for adding value to travel and exploration through the addition of RFID placemarkers, create opportunities for travelers to cross paths.

Picture this city, a small part of downtown Berlin, being visited by two people, Player1 and Player2.

1. Player1 visits a lot of bookstores and other boutiques in the area, leaving small cheap passive rfid tags in places he found especially amazing. Because this is such a great part of town, he left many tags.

2. Player2 has visited Berlin before and met some people that put her on to all the best record stores in the city, most of which are in basements and down inconspicuous alleyways, hard to spot from the sidewalk. She has left them with tags, along with a few other places she is fond of.

3. When Player1 enters a bookstore in one of Berlin's major galleries, his device tells him that another user, Player2 has already left a tag there, and it then downloads the co-ordinates of all the other tags that Player2 had placed prior.

4. Player1's device then directs him to the amazing record stores where he goes and discovers many musical gems.



PLAYER 2 has visited/tugged these locations.

PLAYER 1 has visited/tugged these locations.

Each player, can then use his/her compass to find places the other player has recommended.

This district of central Berlin has densely packed streets of shops and galleries. Most of the best stuff is hard to find, and easily passed by.

Both players have visited this gallery. At this point, their "compass" downloads the co-ordinates of the other players tags.



barrio alto / lisbon / portugal

# system scenarios

## User Alias

The simplest possible scenario would involve the tags containing only the co-ordinates of other tags and the "alias" of the users who visited those locations.

## Degrees of Enhancement

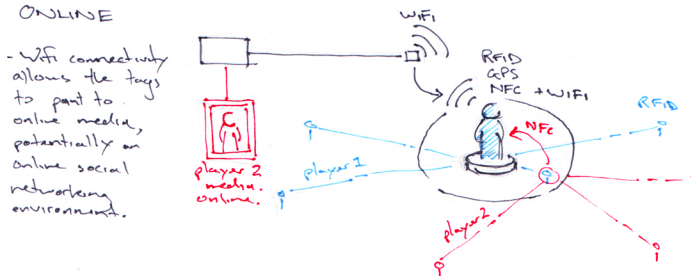
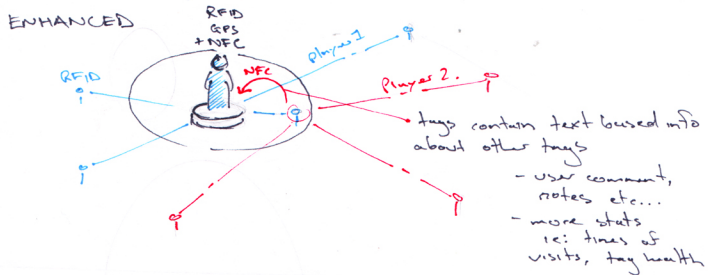
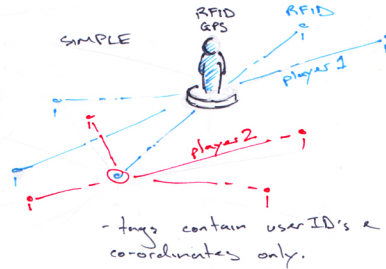
Some kind of textual input interface would allow users to attach descriptions/directions/comments to the tags along with their ID. Another addition could be some kind of simple rating system, such that users could tag 'moderating interesting' places as well as 'amazingly interesting' places.

## An Online Component

Adding WIFI connectivity to the device could allow:

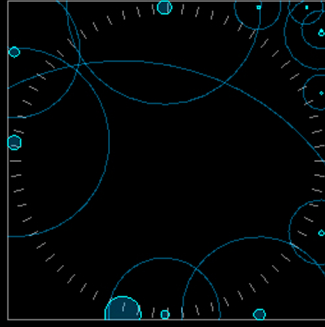
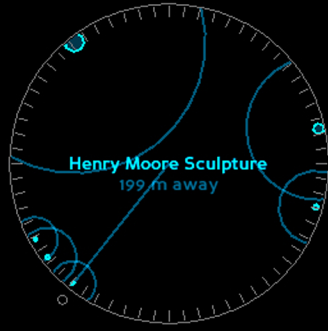
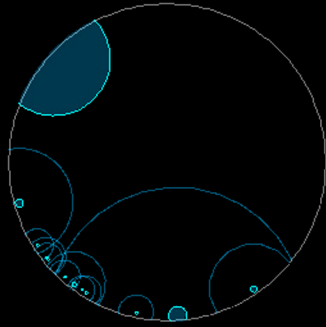
The tags could point to online content, and not be restricted to the capacity of the tag itself. ie: photos/video/audio or any other online content.

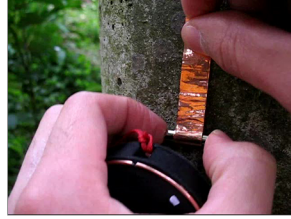
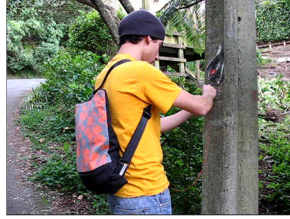
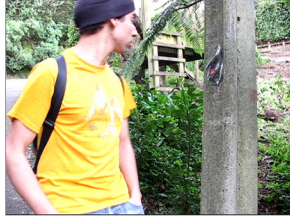
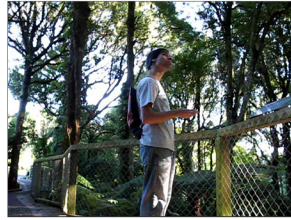
The overall system of tags could be part of an online network where users create profiles based on the places they have been.



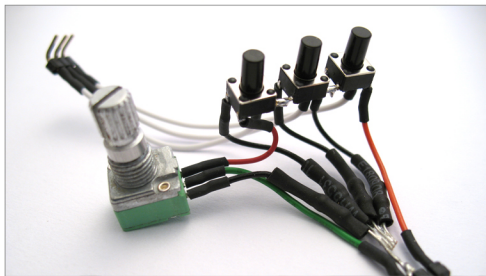




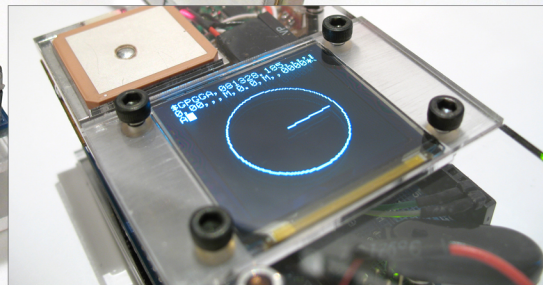
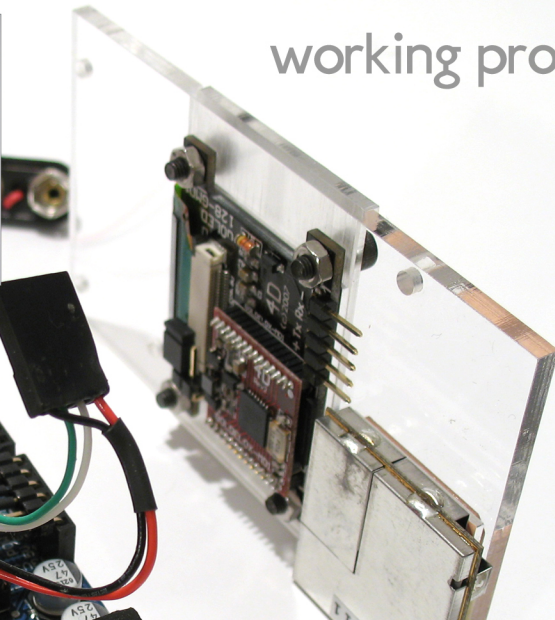


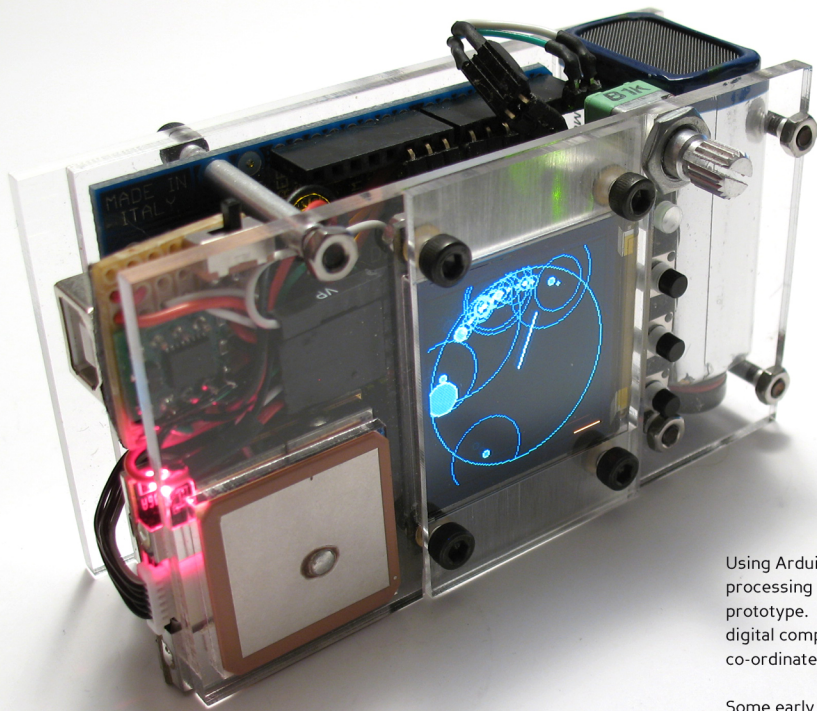






working prototype





Using Arduino, the graphic experiments built in processing were used as the basis for a working prototype. The prototype has a GPS module and a digital compass, and is pre-programmed with the co-ordinates of simulated tags.

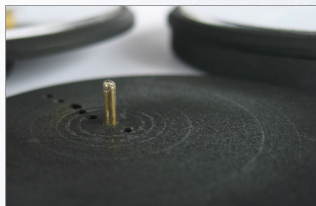
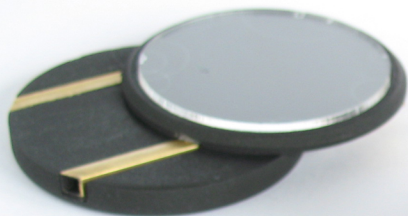
Some early testing of the device highlighted a number of issues with the navigation, in particular a need for some kind of zoom function, so that groups of distant tags can be quickly hidden to allow clearer display of tags nearby.



# ergonomic evaluation







Four cibatool models in varying radii were turned and assessed for portability, legibility and ease of handling. With regards to handling and pocketability, almost everyone agreed that the smallest (57mm) was too small, and the largest (72mm) too big, with the majority consensus decided on the smaller of the middle two, 62mm.

The other handling factor tested was the mechanism for 'opening' the compass so that the bezel could be used one-handed to enter text. Two configurations were built - linear and rotational - with the rotational movement assessed at different offset distances. The rotating motion was overwhelmingly preferred, as most people found the sliding motion was less intuitive given the circular shape.

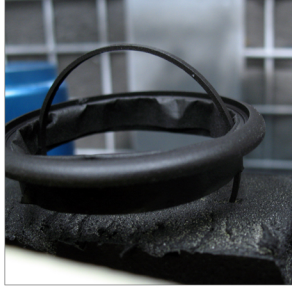
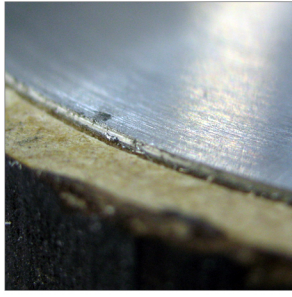
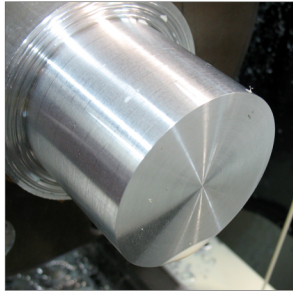
The rotating motion was also preferred with a smaller offset, despite the increased effort this required (the thumb moves a much smaller distance given a larger offset). The small offset seemed to create a more satisfying motion, and at about 62mm the resulting 'opened' shape was more ideal than that from a larger offset. At a smaller diameter, i.e. 57mm, a larger offset would be needed.

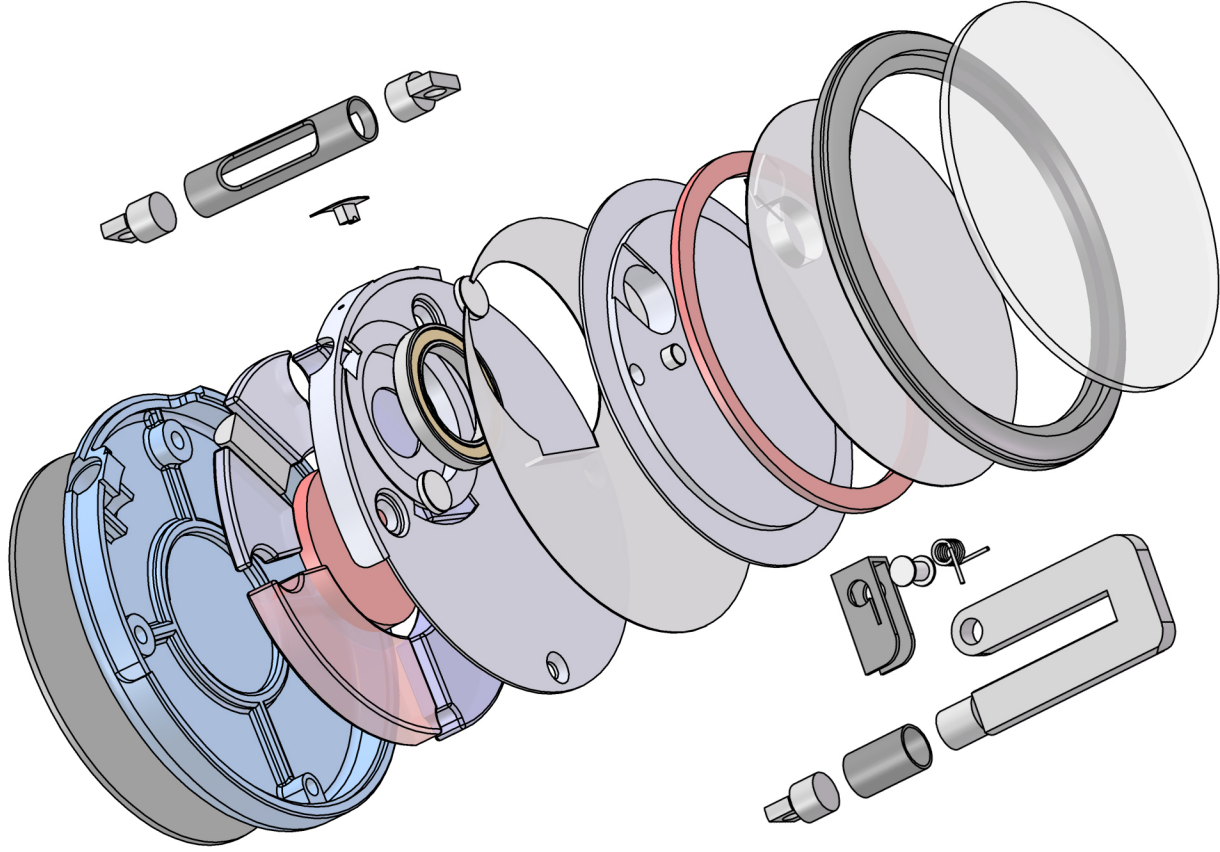


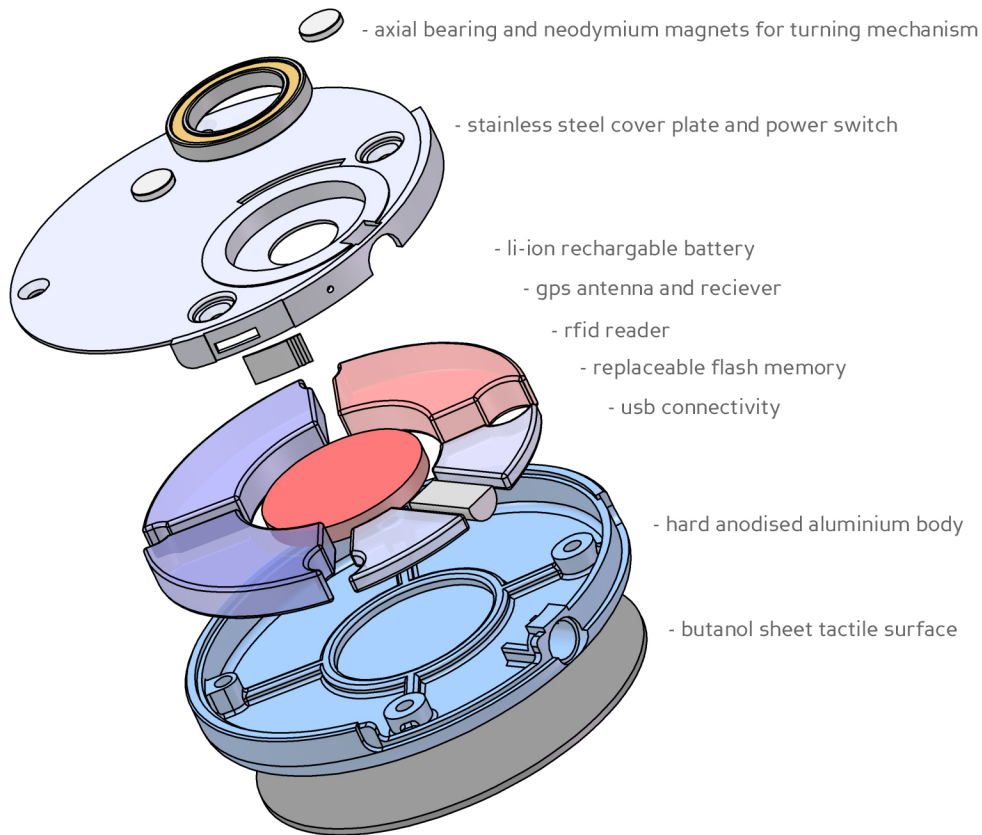
rosa luxemburg platz / berlin / germany



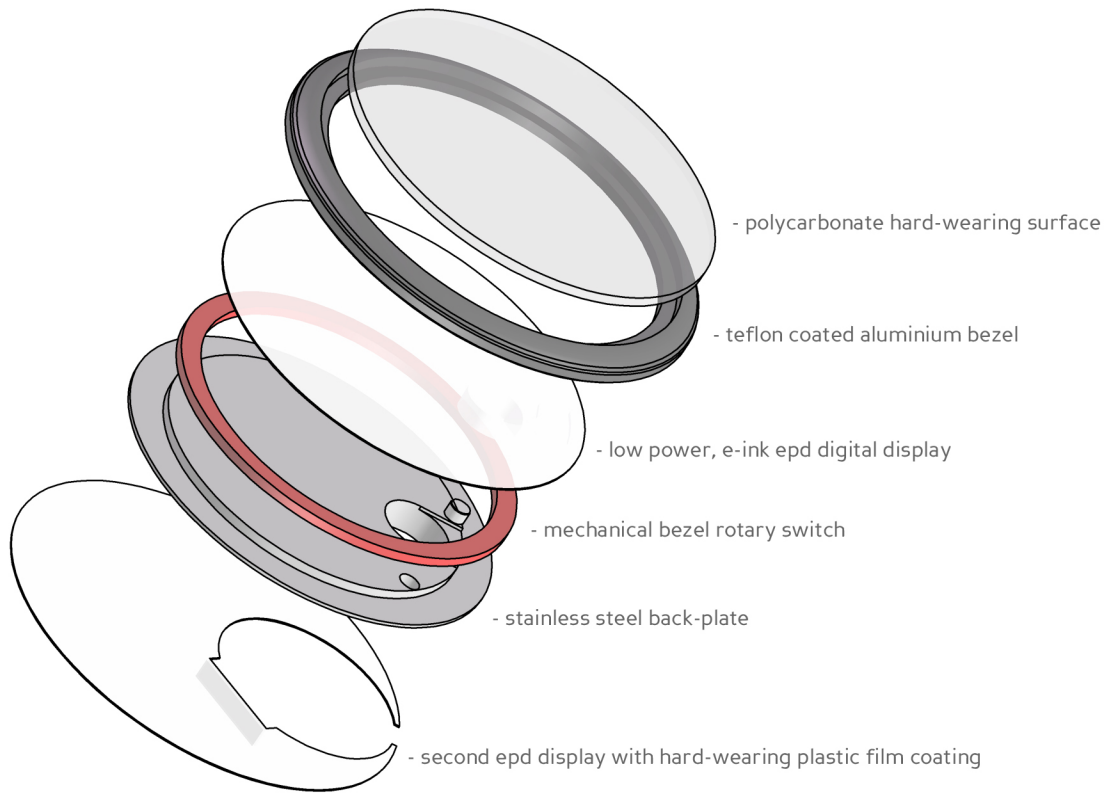


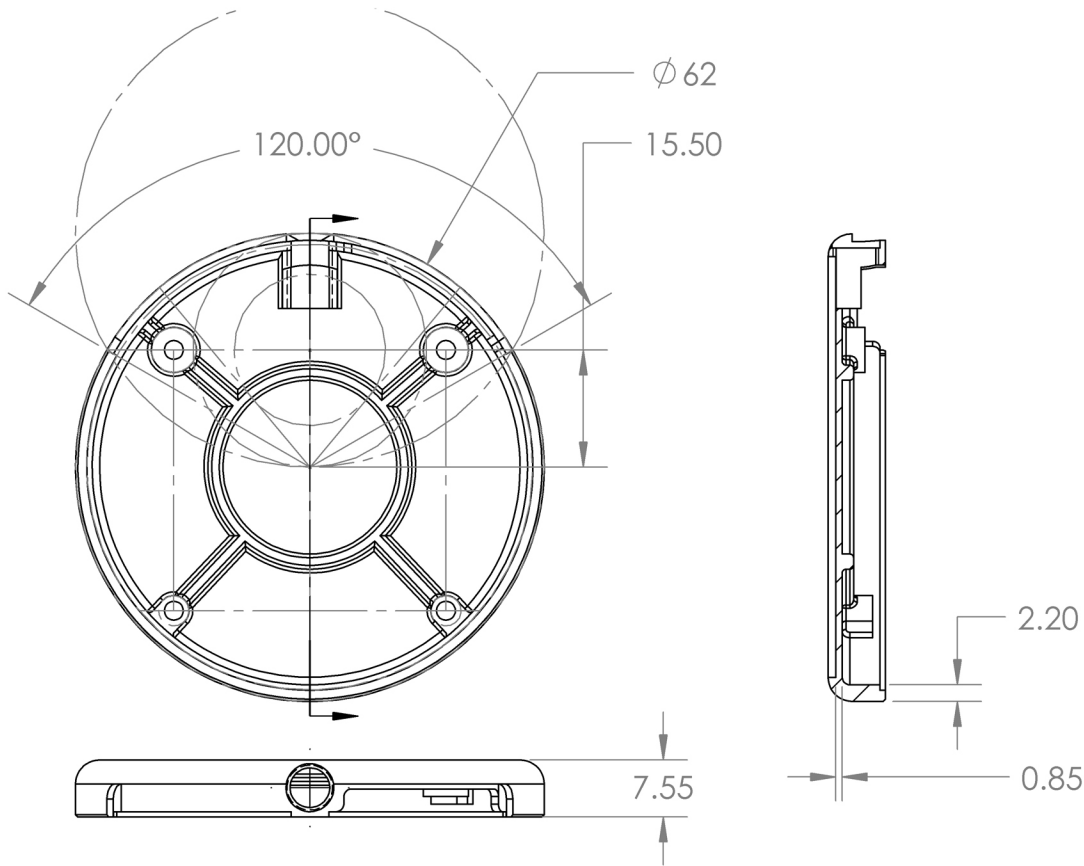


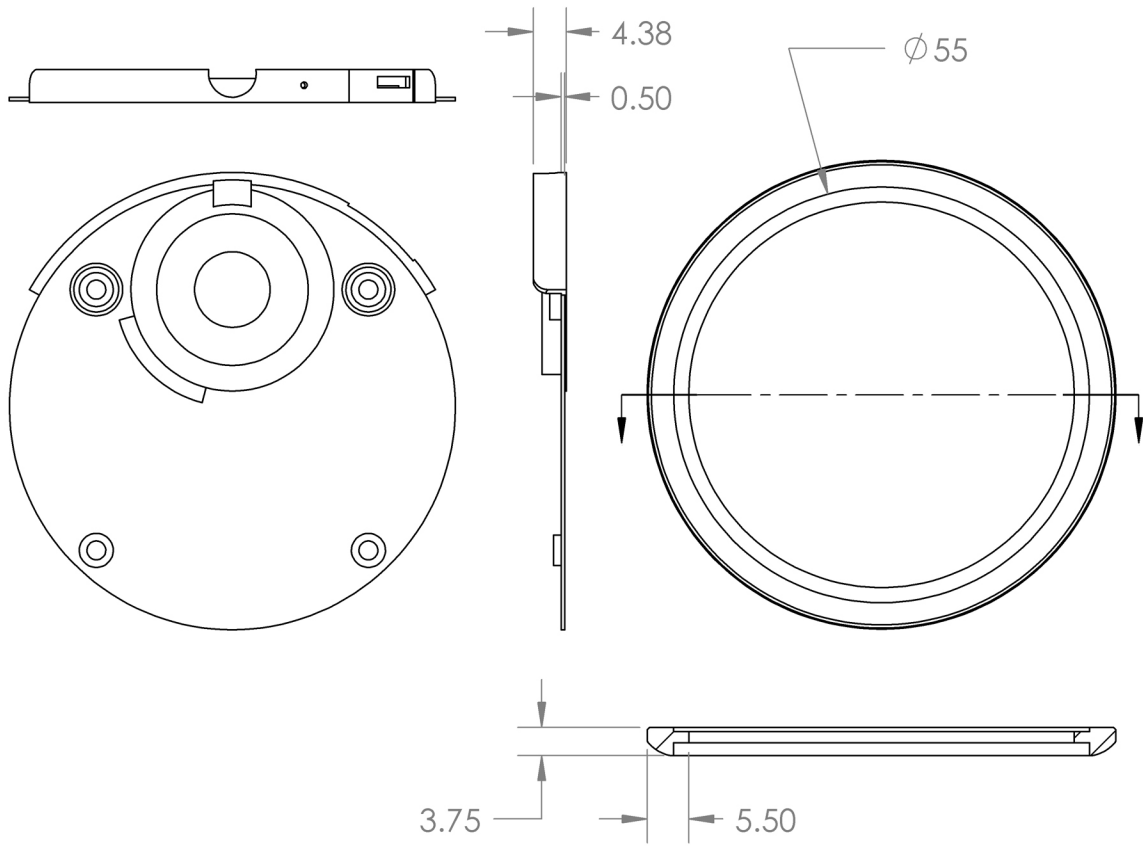




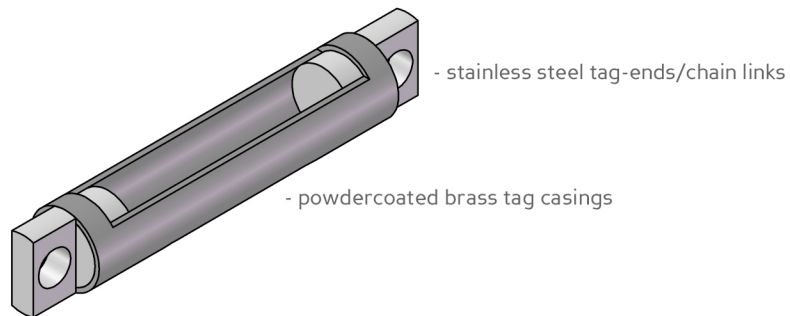
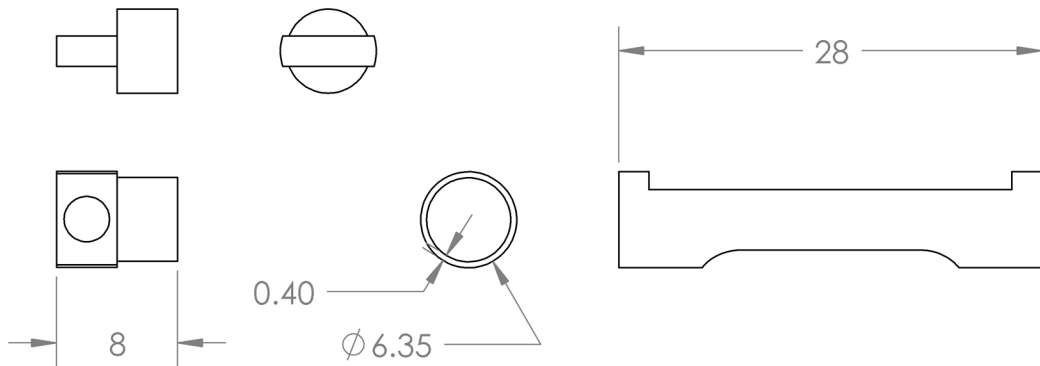


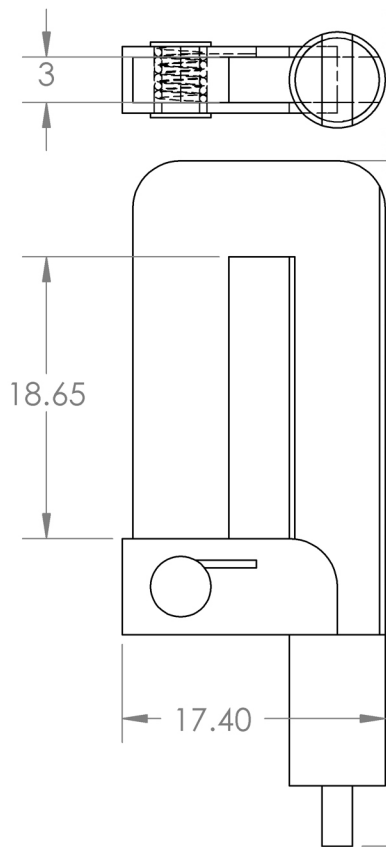




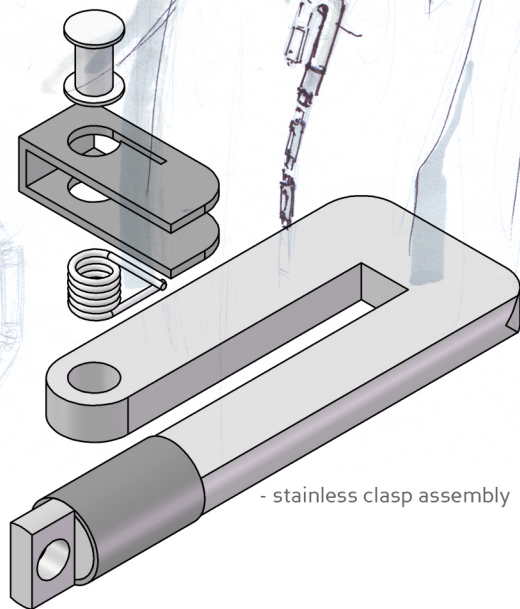








45.35







A person is shown from the side, wearing a black backpack and a blue and black patterned sweater. They are holding a compass in their right hand. The background is a scenic view of a valley with green hills and a clear blue sky.

# narrative

The Patch system centers around the records of GPS co-ordinates stored on the RFID tags. When a user leaves a fresh tag, or if they visit an existing one, that tag is updated with the co-ordinates of all previous tags visited by that user.

Upon arriving at or stumbling upon a tag, the user can immediately browse through a list of all other previous visitors and the places they have been. By opening the compass they can also read comments left on the tag, and have the option of adding their own opinion. Aside from leaving a written comment, users can also rate a location, which in turn alters the appearance of that tag on the compass display.

Internet access offers the user the option of consolidating the records on their personal compass with the online Patch database. Fresh tags that are unrecognised by the database are added to the cloud of bookmarked locations, whilst traveler records, comments and ratings are synchronised with the compass. By logging in, the user can visually scan personal travel records and the trails of other users that they have discovered. Without logging in, privacy is maintained, and only the presence of tags together with some sense of their popularity is publicly visible.

# evolving networks



The user's personal compass operates independently of the online Patch database. Travelers are not obligated to disclose their findings to the world, with the potential for communities of travelers to contribute to offline networks of tags via a simple public/private setting.

In this sense the Patch system is not a single society but a platform for users to adapt and develop for their own purposes. Networks of tags could create new avenues for interaction, forming real meeting places for virtual social networks.



# cloud based navigation



The Patch compass does not substitute for map, but is instead an additional tool that enables new modes of exploration. Rather than giving the user directions, tags are represented on the compass as clouds, indicating direction and distance from the user. If there is a cluster of tags some distance away these will appear as a single cloud, whilst if there are tags within a short distance of the user they will display as individual bubbles, their size indicating proximity.

How well a location has been rated as well the volume of comments it has received both indicate the popularity of a tag, and this is represented on the compass through saturation. A dense, saturated cloud on the display will represent a cluster of popular tags. Likewise, a lone faint bubble would indicate a tag that has received little attention.





This project has stemmed from my own love for travel, and all the chance discoveries I have made in foreign cities that have constantly shaped my understanding and my aspirations.

Patch is not just about finding places, but also finding people. The opportunity to exchange of culture and knowledge is at the heart of the Patch concept, celebrating the Kiwi tradition of the overseas experience.