Customer Requirements

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Abstract

This document outlines the customer requirements for a device intended to ease locating a nearby cell phone. The device is intended to be worn as a necklace, on a bracelet, or on a key chain as a key fob. When activated, the device will wirelessly signal the connected cell phone to sound an alarm to aid in its location.

I. Introduction

This document outlines the customer requirements for a device designed to aid in the location of a lost cell phone (herein referred to as the remote device) in the near proximity of the operator. This device is intended to bridge the gap left by GPS-based location apps which may tell the operator the general location of the remote device, but is unable to pinpoint the remote device's location. Additionally, this device should be capable of operating independently of a cellular network or the internet, allowing the operator to locate their cell phone when in remote locations.

As the intended use-case of the device is the activation of a connected phone which may have been misplaced, the device must be connected to phone wirelessly. Since the device is likely to be used indoors, this wireless connectivity should be reasonably capable of passing through obstacles such as walls and furniture. Additionally, the device may be needed in the course of the operator's work-day which might include travel over a considerable line-of-sight distance outdoors.

As the device may need to be used at any time, it should be easily carried on the operator's person during the course of their day. As such, the ideal form factor would be that of a necklace, ring, bracelet charm, or key fob. Additionally, because the device is to be worn on the operator's person, it should be as inconspicuous as possible to prevent annoyance, barring the use of an external antenna. Finally, due to its potential for regular proximity to its operator's skin, the device should be free of sharp edges or harsh chemicals.

The device should be as simple to use as possible to facilitate rapid location of a lost phone. Thus, the device should be capable of being activated with a single button push.

II. Scope

This document pertains only to customer requirements. Such requirements are often vague and guide designers to key features that are important to an implementation. For more specific requirements, please refer to the *Engineering Requirements* document.

This document pertains only to the device outlined above and not to a remote device. The device should be used with a modern "smart" cell phone, which often feature numerous wireless interfaces. Selection of a wireless standard and determination of the fitness of a particular device is beyond the scope of this document. For more information about the specific selection of wireless interface, and supported phones and devices refer to the *Feasibility Analysis* document.

III. Functional

This section outlines features and specifications that are required for normal use-case operation.

1. Mechanical
   (a) The device shall feature an attachment point for a chain or key ring.
   (b) The device shall feature a button to activate the associated application.
   (c) The device shall feature an internal antenna.
2. Electrical
   (a) Battery and Endurance
      i. The device shall have a battery life of approximately one year.
      ii. The device shall feature a means of replenishing the battery power.
   (b) Wireless Connectivity
      i. The device shall connect to a remote device wirelessly.
      ii. The device shall implement a wireless communication system that is standard on modern (later than 2010) smart phone devices.
      iii. The device shall connect to the remote device over a distance approximately the length of a suburban living room.
      iv. The device shall be capable of transmitting data wirelessly through obstacles such as walls or furniture.
   (c) Computational
      i. Uniqueness
         A. When the device (α) is connected to a remote device (α'), and an identical device (β) is connected to another remote device (β'), the activation of the device (α) shall only activate the connected remote device (α').
         B. A device shall only be capable of being connected to a single remote device at any given time.
      ii. Companion Application
         A. The companion application shall be capable of receiving and interpreting transmissions from the device.
         B. The companion application shall be capable of sounding an alarm or message tone from the remote device in response to an activation message from the device.

IV. Non-Functional

This section outlines features and specifications that relate to the expected operating environment and device durability.

1. Mechanical
   (a) The device shall be comfortably worn as a necklace or be attached to a key chain.
   (b) The device shall be rounded and smooth so as not to injure the operator when worn close to or on the skin.
   (c) The device shall be rounded and smooth so as not to catch, snag, scratch, or tear the operator's garments.
   (d) The device shall be capable of operating correctly after multiple drops from the approximate height of the top of an operator's head.

2. Environmental

   (a) The device shall be capable of operating correctly under heavy clothing or close to or on the skin of an operator.

   (b) The device shall be capable of operating correctly under high humidity conditions.

   (c) The device shall feature a rigid housing that resists penetration.

   (d) The device shall be water resistant or waterproof.

   (e) The device shall feature dust and particle ingress protection.

   (f) The device shall feature a rigid housing that does not become pliable due to heat, pressure, or humidity when worn under heavy clothing or close to or on the skin of the operator.

   (g) The device shall feature a rigid housing that does not irritate the skin when in continuous contact.

V. Revision History

2015-05-26	Initial production