

Product Design Specifications—Digital Braille Watch

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Problem Statement:

In order to determine the time, the visually impaired currently depend on audio or tactile analog watches. However, audible watches are disruptive, while the tactile analog watches are often difficult to read and fragile. Therefore, our client desires a device that uses the standard Braille number system to display the time. This device must be of sufficient size, optimally no larger than a standard Smartphone, have a self-contained power supply, use standard Braille spacing, and display in military time.

Client Requirements:

- Digital military time display
- Silent and without vibrations
- Time in standard Braille

Design Requirements:

1) Design Requirements

- Performance requirements:* See Client Requirements above, in addition to being self-contained, using standard Braille spacing, and of sufficient size (see Size below)
- Safety:* All electronics must be contained and the watch must not contain hazardous materials
- Accuracy and Reliability:* The watch must accurately display military time within the minute
- Life in Service:* The watch must be able function continuously using a self-contained power source
- Shelf Life:* Not specified for prototype
- Operating Environment:* The device must be able to operate reliably in a dry environment
- Ergonomics:* The watch should not contain rough edges or loose components and the display surface should be easy to read
- Size:* The prototype should be similar in size to a cellular phone with thickness being the most important dimension to minimize
- Weight:* Light enough to wear on the wrist comfortably for a day
- Materials:* The device must comprise of non-toxic components
- Aesthetics, Appearance, and Finish:* The watch should be aesthetically pleasing

2) Product Characteristics

- Quantity:* One working prototype
- Target Product Cost:* \$100 or less when mass-produced

3) Miscellaneous

- Standards and Specifications:* Must display time according to the standard Braille language

- b) *Customer*: The customer would like a device that physically displays the time using Braille digits
- c) *Patient Related Concerns*: None
- d) *Competition*: Audible and tactile analog watches are commercially available for the visually-impaired