

Product Design Specification for BME 300 Group 33: Digital Braille Watch
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Problem Statement:

The visually impaired currently rely on watches that audibly announce the time, or tactile analog watches that must be carefully examined to tell time. These options can be disruptive, fragile, and prone to misreading. Our goal is to create a digital Braille watch that employs 24-hour notation to tell the time, does not cause disruptions, and is robust enough to have a long service-life. The Braille display must be sized so that the user can accurately and reliably distinguish the different digits displayed.

Client Requirements:

- Digital military time watch
- Watch must fit on the wrist, or in a typical pocket
- Silent system
- Braille numbering must be used to display the time

1. Design Requirements

The device must meet all of the client requirements

- a. *Performance requirements:* Audible noises must not be emitted from the watch
- b. *Safety:* The watch cannot contain toxic materials, and all wires must be internal
- c. *Accuracy and Reliability:* The watch must tell time to an accuracy of one minute
- d. *Life in Service:* The watch must have a life-span of several years
- e. *Shelf Life:* The watch must have a shelf life of 10 years
- f. *Operating Environment:* The device must be able to operate in a dry environment and be able to endure water, humidity, and temperatures between -30 and 50 degrees Celsius
- g. *Ergonomics:* The device must be able to be worn or carried as a pocket watch, and should not have any rough edges or loose electrical components
- h. *Size:* The watch must fit in a typical pocket
- i. *Weight:* The device must weigh at most .2 kilograms
- j. *Materials:* The device must be comprised of non-toxic components
- k. *Aesthetics, Appearance, and Finish:* The watch must be aesthetically pleasing

2. Product Characteristics

- a. *Quantity:* Only one working prototype. Could be mass produced based on demand and performance.
- b. *Target Product Cost:* Unknown at this time

3. Miscellaneous

- a. *Standards and Specifications*: The client has a patent pending
- b. *Customer*: The customer would like a device that physically displays the time using Braille digits. Possible functions include a power-saving function and a flip cover
- c. *Patient Related Concerns*: None
- d. *Competition*: Watches for the visually-impaired are commercially available, in both audible and analog Braille varieties