

Communication Device

3/7/2010

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Product Design Specifications

Function: To design a device that allows people with communicative disabilities but who maintain motor function to speak and express emotion with their voice. The device must provide immediate output, and it must be intuitive and accurate.

Client Requirements: The device should meet the following requirements:

- Must be able to speak 30 words per minute
- Must be understandable 75% of the time
- Must be intuitive
- Must be phonetics-based
- Must not have any time delay
- Must be adaptable to many forms of disabilities in terms of inputs

Design Requirements

1. Physical and Operational Characteristics

- a. *Performance Requirements:* The device will be used daily and must be able to withstand the force equivalent of a laptop computer including loading patterns and a drop height of 1m.
- b. *Safety:* The device must not provide any risk hazards. It should not have any sharp, poisonous, or shocking parts.
- c. *Accuracy and Reliability:* The device must enunciate, be audible and be able to produce functional statements
- d. *Life in Service:* The device must be useable for three years
- e. *Shelf Life:* the device must work after a 6 months of inactivity
- f. *Operating Environment:* The device will be used in standard temperatures and pressures. It must withstand a small amount of water (equivalent to rain) and temperatures ranging from 0 – 37 C. It must resist the build up of body oils from daily use.
- g. *Ergonomics:* the device must be adaptable to patients with a range of motor control and literacy
- h. *Size:* the device should be easily transported
- i. *Weight:* the device should weigh less than 5 pounds
- j. *Materials:* the device should be nontoxic and be able to be sterilized
- k. *Aesthetics, Appearance, and Finish:* the device must be aesthetically pleasing and have a professional finish and appearance.

2. Production Characteristics

- a. *Quantity:* for class purposes only one prototype
- b. *Target Production Cost:* under \$1000 (budget undecided as of 2/11/2009)

3. Miscellaneous

- a. *Standards and Specifications*: There are not regulatory standards that this device must conform to.
- b. *Customer*: The customer may have a wide range of physical disabilities which must be taken into account when designing adaptive interfaces and inputs for the device.
- c. *Patient-related Concerns*: There are no patient related concerns
- d. *Competition*: There are several devices on the market currently. They are all expensive, cumbersome, and ineffective.