

## Product Design Specification (PDS)

### Motorized Wheelchair Mount (February 2008)

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#### Problem Statement

Design a motorized wheelchair mounting system for a Vanguard Plus speech generating device. The client currently drives an electric wheelchair without the Vanguard mounted. With the device mounted on his chair he cannot see to drive the wheelchair. We are interested to find out if a standard wheelchair mounting system could be adapted so that he is able to move his Vanguard into position to use, then out of the way to drive.

#### Client Requirements:

- Device should run on 12 V or 24 V wheelchair battery or independent source.
- Vanguard Plus should be stowed in position that does not impede user's line of vision.
- User must be able to drive wheelchair while device is still connected.
- Device stored in a safe position free from external collision damage
- Budget \$1000.

#### Design Requirements

##### 1. Physical and Operational Characteristics

- a. *Performance requirements:* Quiet, ergonomic, easy to use
- b. *Safety:* Must be safe for use and transport
- c. *Accuracy and Reliability:* Consistently relocate to intended position
- d. *Life in Service:* 5 years
- e. *Shelf Life:* N/A
- f. *Operating Environment:* Must be able to withstand year-round outdoor weather and endure collisions with walls, doorways, etc.
- g. *Size:* Should not extend beyond wheelchair perimeter or interfere with user.
- h. *Weight:* Should not exceed 10 kg.
- i. *Materials:* No specific requirements, but must be durable.
- j. *Aesthetics, appearance, and Finish:* Should not appear excessively gaudy.

##### 2. Production Characteristics

- a. *Quantity:* 1
- b. *Target Product Cost:* <\$1000

##### 3. Miscellaneous

- a. *Standards and Specifications:* Must not create any back-current into wheelchair battery. Must not interfere with other wheelchair functions such as movement, joystick operation, or seat positioning.

b. *Customer:* Should be accessible and user-friendly to facilitate Vanguard use to ultimately increase user's independence.

c. *Competition:* Currently there is no standard motorized wheelchair mount that meets the user's needs. Our product should provide increased functionality over non-motorized mounts.