**Project Statement & Specifications**

**Travel Dynavox Computer Mount**

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Project for NSF

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**PROJECT STATEMENT**

I. Statement of Need

Cerebral palsy is a neurological disorder that develops generally after a traumatic birth, rendering the newborn without oxygen and ultimately causing brain damage. People who suffer from cerebral palsy are faced with great challenges while performing everyday activities. Sean is a ten year old boy with a severe case of athetoid cerebral palsy. Sean is considered a quadriplegic since all four of his limbs are affected by his disorder, thus leaving him with a lack of balance and coordination. However, he has excellent eyesight and hearing which is uncommon for his affliction. He has the mental ability of a normal boy his age and is mainstreamed into his classes.

Sean’s family is dedicated to keeping him active. This is quite the challenge due to his physical limitations. He is able to go horseback riding, and walk with a specialized walker, or on a treadmill with extensive help. Sean’s desire to maintain a normal lifestyle is one of his top priorities. One desire of his would be to jump on a trampoline like his family and friends. Due to inactivity Sean’s hamstring length has decreased which requires him to stretch daily.

Communication is also a major challenge in Sean’s daily life. His communication skills are limited to facial expressions and gestures. Therefore he uses an assistive communicative device called the Dynavox Vmax. He is able to use the device at school or at home, but while traveling he is unable to hold it. This brings about the need for a travel mount so that he can effectively communicate in the car.
II. Introduction and Overview

The finished computer mount will increase Sean’s independence and capability to participate in daily activities. The travel computer mount for his Dynavox assistive communication device will allow him to express himself even when he is away from his desk.

The travel computer mount will be made to accommodate the Dynavox Vmax model. Although various travel mounts have been made for navigation systems, CD players, and television screens, a Dynavox Vmax travel mount remains a novel idea. This mount will have to secure the Dynavox Vmax in place during travel without blocking power supply and USB ports, so that it is easily accessible and clearly visible to the user. The challenge will be to design a model that will support the Dynavox Vmax in the family’s vehicle and still be used in versatile settings.

III. Realistic Constraints

The development of the car mount will be limited by many factors. Since this project is funded by the National Science Foundation Engineering Design Projects to Aid Persons with Disabilities (NSF) they will have to approve all budget appropriations. The family will be responsible for any future maintenance costs. The availability and costs of materials will affect the overall design. Aside from economic constraints, other restrictions in the design of both devices remain.

The computer mount must fit within the back seat of the car and still allow Sean and others to sit comfortably and safely. The mount must be able to withstand and
remain unaffected by temperature changes in the car. The mount must also be able to hold the weight of the computer and withstand repetitive use. The mount should not be obtrusive or dangerous to Sean and the other passengers in the car. The mount should be safe during operation of the vehicle as well as in the event of a car accident, and it should also be clear of any airbags in the vehicle.

In addition to these considerations, there lies political issues that must be addressed. The many misconceptions about Sean’s condition cause a stereotypical view of those with cerebral palsy. Certain doctors and most of the educational system have their own ideas of Sean’s abilities and possible improvements. The school system’s concern for their own legal liabilities causes them to limit Sean’s movement while he is in their custody. There are also some doctors that agree with this limited movement strategy claiming that there is no hope for improvement in Sean’s condition. On the other hand, there are doctors that agree with the family’s beliefs in keeping Sean active to increase his independent movements.

IV. Other Data

Sean and his family are very active, and it will be difficult to schedule times to meet with them. Sean’s parents are full time workers, and Sean attends school during the day. Additionally, the family regularly travels around the country visiting cerebral palsy specialists.
Also, because this is an NSF funded project, budgets and designs may have to be discussed and approved prior to building. For additional information on the NSF organization please visit http://nsf-pad.bme.uconn.edu/.

IV. Questions

Computer Mount

- How will the design securely hold the computer in place, without being excessively bulky?
- Can other device holders be implemented or modified in this design?
- Can the mount be placed in the car permanently, or should it be removable?
- What changes to design should be made if the family decides to purchase a new car?
- How will the mount be secured without damaging the car or upholstery?
- Where will Sean’s head control buttons be placed in the car?

VI. Other Activities

The Dynavox computer mount may have some copyright issues. Distribution may require affiliation with the Dynavox company because the mount is made especially for the device. The Dynavox is widely used for a number of conditions and therefore has a larger market. Since, there has been no travel mount made specifically for this device, there may be a demand for it. The cost of similar travel mounts for electronic devices should be considered when pricing.
Surveying patients with cerebral palsy and similar conditions and identifying their needs will help with the sales process. Their input could also affect possible design options, and direct future investigations.

SPECIFICATIONS

I. Operational Specifications

A mount for the Dynavox computer is imperative to aid in communication during times of travel. The design should enable the user to have full functional access to the computer system while in the car.

II. Technical Specifications

Sean Bernstein Figures:

<table>
<thead>
<tr>
<th>Height</th>
<th>50 inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>55 pounds</td>
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Dynavox Vmax:

<table>
<thead>
<tr>
<th>Size</th>
<th>12.5&quot; X 10&quot; X 3&quot; or 32cm X 25cm X 7.6cm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>6lbs 14oz or 3.12kg</td>
</tr>
<tr>
<td>Screen Size</td>
<td>12.1&quot; or 30.7cm</td>
</tr>
<tr>
<td>Ports to Avoid</td>
<td>CompactFlash Card Port, Ethernet Port, External Microphone Port, External Speaker Port, Built-In Internal Microphone, 2 USB 2.0 ports, 2 standard switch ports, dual infrared ports.</td>
</tr>
</tbody>
</table>
Fig. 1 Dynavox Vmax Assistive Communication Device