Travel Computer Mount

&

Assistive Jumping Device

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Sponsored by:
NSF

Client Contact:
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Travel Computer Mount Overview

1 Introduction
   a. Background
   b. Purpose
   c. Previous Works

2 Objective

3 Methods

4 Budget

5 Conclusion
There are many disabilities which can impair an individual's communication skills.

One such disability is cerebral palsy.

Assistive communicative devices such as the Dynavox Vmax allow these individuals to effectively communicate.

While these devices work extremely well, there is a need for a travel mount that will allow for effective operation in motor vehicles.
Purpose

To design and build a mount for the Dynavox Vmax which will allow for its full usage while in a motor vehicle.
Previous Works

Figure 1: NSF Project Communication Device Mount

Figure 2: NSF Project Dynavox Mounting System for Horseback Riding
Previous Works

Figure 3: RAM Mount Tablet Computer Mount

Figure 4: Chevrolet Astro Jotto Desk Mount

Figure 5: Flat thin screen TV/monitor automotive roof mount Patent D467562
Objective

The Device Will:
- Support the Dynavox Vmax
- Allow users and passengers to view and access Vmax easily
- Allow for easy re/detachment of the Vmax
- Allow for installation in variety of car models
- Have adjustable height
- Withstand vehicle vibrations
- Not compromise safety of passengers
Methods

- Daessy mounting plate and quick release base
- Will connect the mounting framework to the Dynavox Vmax
Methods

Side View of Back Seat
Schematic of possible positions of the travel mount relative to the passenger seat and backseat of the vehicle.
Methods

Vmax Suspended by Springs or Straps

Vmax Encased by a Frame with Shock Absorption

\[ N = F_s = kx \]

\[ N = F_s = kx \]
## Budget

<table>
<thead>
<tr>
<th>Materials</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dynavox Base</strong></td>
<td></td>
</tr>
<tr>
<td>Adjustable Straps</td>
<td>$4.36 for 2 feet and $.50 for each additional foot</td>
</tr>
<tr>
<td>Metal Rods and Sheets</td>
<td>$20.00</td>
</tr>
<tr>
<td>Ball and Socket Tubing</td>
<td>$5.49 for 6 inches</td>
</tr>
<tr>
<td>Ball and Socket Joint</td>
<td>$7.52</td>
</tr>
<tr>
<td>Metal Hinges</td>
<td>$3.00</td>
</tr>
<tr>
<td>Metal Clamps</td>
<td>$5.00</td>
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<tr>
<td><strong>Quick Release Mechanism</strong></td>
<td></td>
</tr>
<tr>
<td>Daessy Quick Release Base</td>
<td>$82.00</td>
</tr>
<tr>
<td>Screws, nuts, bolts, etc.</td>
<td>$5.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$98.00-$135.00</td>
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</tbody>
</table>
Conclusions

Assistive communication devices have helped many people with disabilities. However, without a travel mount for these devices, communicating for these people becomes extremely limited. Due to the low cost of production, versatility and demand for this product, it should be a success on the market.
Assistive Jumping Device Overview

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Background

Advances in the medical field have improved the lives of people with disabilities. Despite these advances, there is no assistive jumping device that will allow the severely disabled to jump on a trampoline. The benefits of jumping on a trampoline include: muscle conditioning, improved balance and coordination, and increased self-confidence.
The Assistive Jumping Device (AJD) will allow people with cerebral palsy and similar conditions to independently jump on a trampoline.
Previous Works

Figure 6 Adjustable Trampoline Support
Patent 5788606

Figure 7 NSF Project Dancer Assistant
Objective

The Assistive Jumping Device must accomplish the following:

- Maintain support of the torso and upper extremities of the user while allowing full motion of the legs to jump.
- Maintain stability of the user while jumping in the device and to withstand the repetitive motion and usage.
- Framework must be sturdy and withstand the forces of usage
- Withstand the outdoor elements (rain, snow, wind, lightning, etc.)
- Provide for the safety of the user as well as for other people on trampoline not using the device.
- Consider the growth of the user in future usage.
Methods

A supportive harness will maintain user safety while allowing free leg movement

Figure 8 Sample Harness
Methods

Bungee cords and/or springs will attach the harness to the supportive metal frame.
Methods

FBD of jumper in contact with trampoline

FBD of jumper in mid air
<table>
<thead>
<tr>
<th>Part List</th>
<th>Individual Price ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Structural Carbon Steel Pipes</td>
<td>70.00-300.00 each</td>
</tr>
<tr>
<td><em>(Width: 1.5-4 inches, Height: 10-21 feet)</em></td>
<td></td>
</tr>
<tr>
<td>Contour Post Padding</td>
<td>6.50-8.00 per square foot</td>
</tr>
<tr>
<td>Carabineer</td>
<td>7.95-34.95 each</td>
</tr>
<tr>
<td>Harness</td>
<td>40.00-163.00</td>
</tr>
<tr>
<td>Bungee Rope</td>
<td>1.00-40.00 per foot</td>
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<tr>
<td>Spring</td>
<td>1.00-5.00 each</td>
</tr>
<tr>
<td>Flat Heavy Duty Nylon Strap</td>
<td>2.85-7.61 each</td>
</tr>
<tr>
<td><em>(Length: 2-30 feet)</em></td>
<td></td>
</tr>
<tr>
<td>Metal D-Ring</td>
<td>0.25-0.55 each</td>
</tr>
</tbody>
</table>
Conclusion

- Exercise options are limited for those with disabilities
- There is no device to properly support disabled jumpers
- It is essential to address this problem
- All should be able to enjoy the joys of trampoline jumping
Acknowledgments

- Dr. John Enderle
- David Price
- NSF
- The Stenglein Family
Questions?