

System Design Review Notes

Action Items:

- Rabbit
 - Determine if the Rabbit comes with tools
 - If there are no tools, determine the tools that we will need
 - Determine the cost of the Rabbit
 - Meet with Linda to discuss the necessary add-ons for the stander
- Human Interface Device
 - Look in to other options (push button switch requires less motor skills)
 - Some of the kids may have trouble with the field goal
- Trainer Mode
 - How did we rank? The matrix doesn't support the decision
 - Reevaluate the system
- Hazard Detection
 - What sensors are good/bad in humidity/snow/rain/etc.
 - What sensors are good/bad on concrete (rough/course/wet/etc.)
- Stopping Distance
 - Lower the speed to 3 mph
 - Create a graph to show the stopping distance calculations
 - Look into user input to change speed (knob)
 - Linda needs to be able to adjust the speed of the stander
 - How will there be a limit on the speed?
 - Clarify the stopping distance calculation
 - The diagram
 - Center of gravity (user and stander)
 - Center of mass (user and stander)
 - Height of student
 - Write out all assumptions
 - Include obstructions (wedging under wheel) creating tip
 - Explore dynamics of scenario (inertia)
 - Look in to worst case scenario with child hanging over the side
- System Architecture
 - Input converter to switch HID controls
 - It's feasible, but it may not be for the time we have on this project
- What if the motor fails?
 - Need a mechanism in case of failure
 - Depends on the nature of the failure
 - Gear motors/direct drive
 - What do we do to move it if everything fails?
 - What deploys the wheels

System Design Review Notes

- Sensors
 - Do the ultrasonic sensors create noise?
 - Is the noise loud/noticeable/annoying
 - Where will the sensors be located?
 - How will they be attached (they should look professional)
- Stander Assembly
 - Make it easy for the trainer to reassemble the stander so the pieces can't get lost

1. Make a list of everything we have to do
2. Determine how long each will take
3. Rank what options are preferred to completed

In week 7 we will need to have identified the key technical problems

System Design Review Notes

Notes:

- Wheels
 - The stander that Day has constructed has the motorized wheels placed in the front – it tends to be easier
- Raise/Lower System
 - Initial Notes
 - The stander will go as close to touching the floor
 - The stander needs to be raised when moving because of objects that could get in the way
 - Final decision
 - Can we really raise/lower the system?
 - There will be a large motor
 - **Removed raise and lower system**
- Stopping Distance
 - Calculation to determine the max safe speed may be changed in MSD 2
 - Only covered the statics
- System Architecture
 - Assuming digital

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Stander:

User high varies from 40"-48"

• Size:	<u>(1 or 2)</u>	\$1,755	Southwestmedical.com
• Wheel size:	<u>26-26"</u>	\$0	Southwestmedical.com
• Head support:	<u>No</u>		
• Chest Support:	<u>(size 1 or 2)</u>	\$167	Southwestmedical.com
• Hip Support:	<u>Rotational – size 1</u>	\$284	Southwestmedical.com
• Knee Support:	<u>Knee support with Strap – size 2</u>	\$216	Southwestmedical.com
• Foot Plate:	<u>Hinge Separate Foot Strap</u>	\$364.50	Adaptivemall.com
• Accessories:	<u>Tray</u>	\$293	Southwestmedical.com

Contact snug seat or southwest medical and ask if we can use the Pommel & Sacral support along with the rotational hip support.

Request the assembly/CAD drawings