

18-TranzVolt 2.0

Problem Statement

Lifting heavy loads onto rooftops can often be inconvenient and sometimes even dangerous. However, this is routine work for employees at construction/roofing/installation jobs. Tie Down provides a solution to this problem through their LiftHoist and TranzVolt products, both of which are portable lifting devices that lift loads along a ladder-like track.

Our goal is to improve the current design of TranzVolt, specifically to address three problems that currently exist: high deadload, freefall hazard and a steep learning curve. The system, with a payload rating of 200lbs, must be able to lift a deadload of 98lbs including the motor, gearbox, carriage and batteries, while also travelling at least 1 ft/sec. In addition, the rope should be better designed to bear the weight of the payload and prevent it from falling to the ground. Finally, operating the TranzVolt requires training in 3 different areas: remembering various button combinations, recognizing warnings by interpreting combinations of buzzer sounds and blinking lights as well as responding to emergency situations like obstructions, overload and low battery. We want to reduce the learning curve and setup time required for operators of TranzVolt.

Project Plan

See Gantt Chart.

Task Assignments (tentative)

We decided that each person would be assigned to “own” an equal amount of the deliverables. This person is expected to be the head of that document and ensure that it gets completed. It is not expected that they are to do all the work, we should all be helping with almost every deliverable, with the owner ensuring that the people with proper skills help them with their respective portion. After our discussion with the sponsor today, we decided to collaborate at a high level with the other ME team, but submit deliverables and tackle fine grain tasks individually. Once we have a clearer division of tasks between the teams as well as an intended solution to the problem, this list will most likely expand.

- 1. Oliver Bunner**
 - a. Problem Statement and Organization**
 - b. Primary Ideation Report**
 - c. Risk Analysis**
 - d. Final Design, Mockup and Presentation**
- 2. Dakota Survance**
 - a. Task Assignments**
 - b. Prior Art**
 - c. Prototyping Updates**
 - d. Frabrication Package**

3. Su Yoon
 - a. Specifications
 - b. Team Presentation
 - c. Industrial Design
4. Raymond Jia
 - a. User Needs
 - b. Concept Selection and Justification
 - c. Team Presentation
5. Sri Krishna
 - a. Codes and Standards
 - b. Engineering Feasibility Analysis
 - c. Detailed Technical Analysis
6. Juyeop Baek
 - a. Market Research
 - b. CAD Updates
 - c. Design Performance Prediction