1. Front Matter

1.1. Executive Summary

The E-Sk8 team will create an electric skateboard with a streamlined look and a unique braking system. There are currently less than five manufacturers of electric skateboards. All of which follow the same basic design consisting of wooden decks and electric motors powered by rechargeable batteries. The current designs are heavy and often underpowered.

Like the current designs, the E-Sk8 design will utilize an electric motor and rechargeable batteries. Unique to the E-Sk8 design will be a deck constructed of carbon fiber and has regenerative brakes that will prolong the life of the battery. The goal of the E-Sk8 team is to make an electric skateboard that will be lighter weight and will have a longer battery life per charge than the current designs.

To reduce the weight of the skateboard, the deck will be made of a carbon fiber composite skin wrapped around a high-density foam core. The foam core may be easily carved into a complex, contoured shape. The sensitive electronics and the batteries will be housed within the deck. Placing these components inside the deck will prevent debris from fouling the electronics. The deck will have a small door to access the circuits and battery.

The batteries will be rechargeable and may be recharged by either plugging them into a standard 120V wall socket or by braking. When the brakes are applied, a dynamo generator will convert the kinetic energy of the skateboard and rider to electric energy that will be used to recharge the battery. Regenerative braking will increase the life of the battery per cycle. The longer the life of the battery the farther the skateboard will go on a single charge.

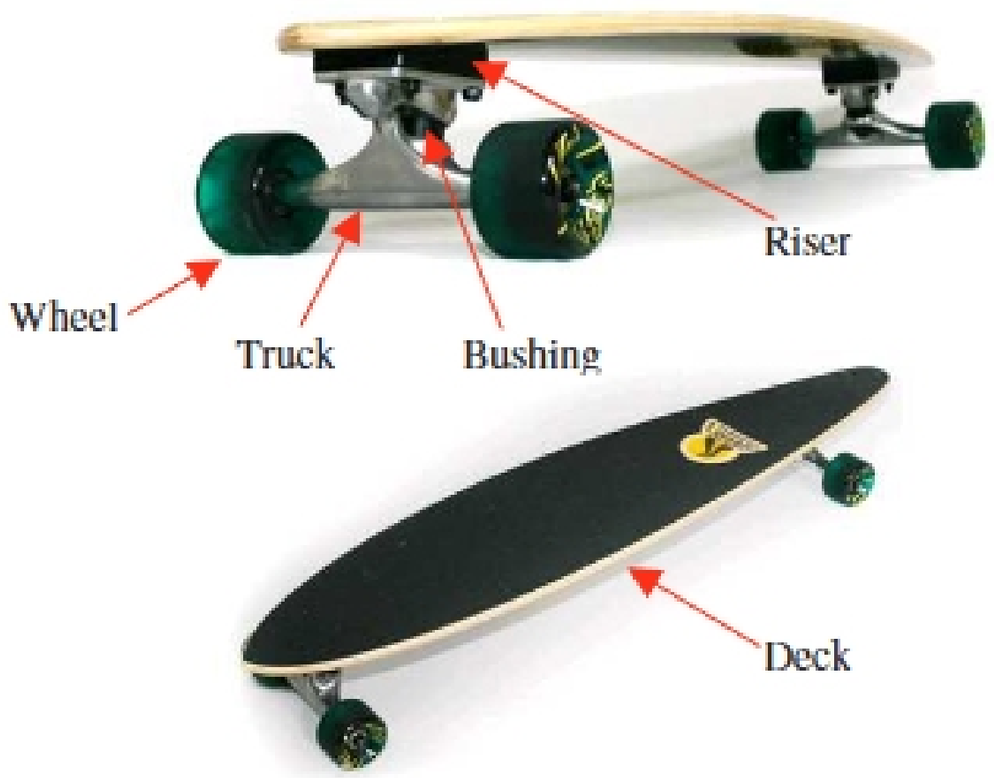
The DC motor will drive the rear wheels of the skateboard via a geared connection or belt that allows motion of the rear trucks. It will have variable

speed control to smoothly accelerate the rider. When the motor reaches a maximum speed or the when rider chooses, the skateboard will coast.

The design of the circuits of the drive system and the regenerative braking system will pose the greatest challenge for the ESK8 team. Therefore, these systems will be the initial focus of the project. Functioning drive and braking circuits will be completed by November 30, 2006.

The cost to build an electric skateboard will be $400. In addition to the contribution from the Engineering department the team will solicit donations. Potential fundraising sources will be composite engineering firms and skateboard retailers.

The completion of the electric skateboard project will require several tasks including: the manufacture of the deck, the building of a drive mechanism that connects the motor to the wheels, and the wiring of the circuitry to control the motor and braking system. Donations will help fund the cost of manufacturing the electric skateboard. The lighter weight E-Sk8 electric skateboard will travel farther per charge than the designs on the market.



http://www.sector9.com/2006/

Figure 1: Standard Skateboard Design

1.2. Table of Contents