

# I. Project Design Specifications

## Board for Glaucoma Research (PDS)

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**Function:** Mr. Galen Heyne, the client, has requested a device to allow a monkey board to adjust in the XZ-plane (move in the horizontal direction, move in the vertical direction, and be able to rotate at a minimum of 90 degrees) in order to make his research on glaucoma more efficient.

### Client requirements:

- Must be able to move in the x-direction (rough and fine adjustments) (horizontal)
- Must be able to move in the z-direction (vertical)
- Rotate at least 90 degrees
- All rotations must be mechanical (no electronics for Animal safety)
- Has to be easily cleaned

### Design requirements:

#### 1. Physical and Operational Characteristics

- Performance requirements:*
  - Must move in XZ plane
  - Must be able to rotate 90 degrees
  - Must have a locking mechanism
- Safety:*
  - Must be mechanical
- Accuracy and Reliability*
  - Needs to have a mechanically controlled amount of precision (1 cm or less)
  - Needs to have consistency with positioning
  - Consistent initial securement for each monkey
- Life in Service:*
  - We want to design this board so that it will last for 10 years
- Shelf Life:*
  - Sterile before use
  - Easily storable
- Operating Environment:*
  - Laboratory research
  - Room Temperature- 15-30 degrees Celsius
- Ergonomics:*
  - Comfortable for the cynomolgus monkey

- ii. Increase efficiency of the research
    - iii. Easy to use for the research
  - h. *Size:*
    - i. Monkeys are 38 to 55 cm long
    - ii. *Weight*
      - 1. Females are 7 - 13 lbs
      - 2. Males are 11-20 lbs
  - i. *Weight:*
    - i. Females are 7 - 13 lbs
    - ii. Males are 11-20 lbs
  - j. *Materials:*
    - i. Steel
    - ii. Epoxy
    - iii. Fiberglass
    - iv. Plastic
    - v. Wood
  - k. *Aesthetics, appearance, and finish:*
    - i. Function over aesthetics
- 2. Production Characteristics**
  - a. *Quantity:*
    - i. Only need to make one
  - b. *Target Product Cost:*
    - i. \$200.00
- 3. Miscellaneous**
  - a. *Standards and Specifications:*
    - i. Follow monkey handling ethical specifications
    - ii. Must be safe and comfortable for monkeys
    - iii. Must decrease stress of monkey
  - b. *Customer:*
    - i. Customer *must be* able to move to the table
  - c. *Patient-related concerns:*
    - i. Don't want the researcher or monkey to get pinched
    - ii. Whole machine must be sterile
  - d. *Competition:*
    - i. The competition is the preexisting board