Project Specifications

The ATPC-X42 All-Terrain Power Chair

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Operational Specifications

The device is to be an all-terrain power chair that has a low center of gravity that is run via a rechargeable battery. The chair itself will be that of a normal power chair. However, the base must be wide enough to maintain stability and high enough to have clearance from the ground. The wheels also need to be large enough to travel on rough terrain, such as hills and rocks. For user operation, a right-handed joystick is necessary, as well as a kill switch for safety purposes. Also for safety, the constraints necessary are a seat-belt at 45º from the frame of the device, a harness, and something to keep the operator from slipping out of the seat. A mechanism that warns the operator of slopes that are too steep is needed. An auto-braking mechanism is also needed in case of excessive speed. Portability is desired, as the device could be taken to different locations that way, and it must be able to be stored inside a house, meaning it has to fit through a standard house entryway.

Technical Specifications

Physical:
- Type of Material: aluminum chassis
- aluminum and steel seat mount
- rubber tires
- plastic and foam seat cushions
- Size: 36” x 28” x 45” (L x W x H)
- Weight: TBD
- Speed: 7 mph
- Power: 2hp motors
- Turning Radius: rotate in place

Mechanical:
- Maximum Input Voltage: 24V (2 12V batteries)
- Maximum Input Current: unknown
- Maximum Output Voltage: 24V
- Maximum Output Current: 80A

Electrical:
- Storage Temperature: -4°F to 140°F
- Operating Temperature: 0°F to 140°F
- Operating Environment: indoors/outdoors, any terrain

Software:
- User Interfaces: joystick, kill switch
- Hardware Interfaces: tilt/slope meter
Features: direction control, warning when approaching steep slopes, seat automatically actuates with respect to slope

Safety:
  Constraints: five-point harness, 45° seat belt,
  Other: tilt meter with alarm, auto-actuation of seat

Maintenance: Battery recharging
              Battery replacement
              Cleaning