**Chapter IV. Design Specifications**

This chapter contains the basic user requirements - sometimes identified as 'Level 1 Specifications' . The engineering values that are derived from these basic user requirements are your design specifications. They include engineering targets which are usually hard numbers and not-to-exceed values. If your device works with another component or system (nearly all devices do!) then the interface specifications are identified in this segment. If necessary, a brief discussion of how you arrived at your specifications may be included. Itemized or bulleted specs are standard. Your specs should include as many numerical values as possible as long as they are accurate and traceable to some firm requirement. You should tie these in with the information in the preceding chapters.

Due to the fact that this project proposal is a type of competition and lacks both a sponsor and firm/OSHA/professional/industrial standards, many specs will be either required by the competition guidelines or the personal targets for the group.

Offensive/defensive Specifications:

* If wedge or flipper is utilized (see Chapter V) the device must be able to lift/push a 20 lb object with ease. Shooting for >25lb.
* Bot can also withstand 20 lb of pushing force from opponent, based on friction and motor stall torque.
* Must be able to withstand at least 25 lb added weight in case another bot gets on top.
* If an externally threaded (or studded) roller is utilized, it must also be able to inflict at least 20 lb of force.
* If a strictly geometric wedge is used, (no hydraulics) the bot must be able to gain enough speed to push around another 25 lb bot.

Assembly Specifications:

* Battery should provide enough power to run for 3 minutes continuously and be replaced or charged in under 5 minutes.
* Motor and wheel assembly must provide as well as withstand a force of 25 lb.
* Turn radius of at least 3 ft

Interface Specifications:

* Bot must include a master power disconnect switch
* Control system must interface with driving motors as well and a remote control which is reliable over at least 33.28 ft. (SQRT((20ft^2) +(20ft^2)) +5 ft)

Material Specifications:

* Device (Not including peripheral equipment) must weigh between 20 and 25 lb in order to meet requirements and not be pushed around easily.
* Device must stow into am 18” cube.
* Device must not have sharper than 1/8” radius edge.
* Device should cost between $500-$1000 and include receipts.

At this level, the basic numerical values that can be achieved was assumed, and the calculation were made based on those values. As the project progress, with more research and testing, the values can be increased for decreased according to the need of overall performance of the Battle bot.