

Self Leveling Device

Sean Hendrickson
Waleed Alhaddad
Taylor Griffin
Adrian Steele

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NOTES FOR ASSIGNMENT

Requirements:

- Functionality
 - The device should keep itself level while powered on.
- Performance
 - The device should level itself within half a degree.
 - Should move to a level position within 1 second of becoming unlevel
- Economic
 - Total parts cost will not exceed \$150.
- Energy
 - The system will should run off batteries for at least 2 hours.
- Health & Safety
 - Power system and components should be inaccessible from user.
- Legal
 - Should be published with MIT license.
- Environmental
 - Should be manufactured with lead free solder.
- Manufacturability
 - Should be have no more than 2 layers on PCB.
- Operational
 - Device should be smaller than a cubic foot.
 - Device should not weigh more than 5 lbs.
- Reliability & Availability
 - Table should hold 1 lb. without breaking.
- Social & Cultural
 - Should be visually appealing.
- Political
 - Should not be available in North Korea.
- Usability
 - Should be simple and intuitive to use.
- Documentation
 - Should include assembly instructions.

Needs Quick list:

- Must be able to place a stable object and not have it slide off
- small
- low power
- light weight (example: No more than 5 pounds)
- Table should not warp
- Base can level up to (30 ?) degrees
- Since device is held in hand what is max amount of torque and angular velocity a person to exert. (30 deg/s MAX angular velocity: [link](#) pg. 142)

1. Should be energy efficient
2. Can fit in one's hand
3. Is light weight
4. Can keep an object stable
5. Should be easy to use

Requirements:

- 1) Must use PCB
- 2) Must have microcontroller on PCB and not on breakout board
- 3) PCB cannot be less than 1" on either side
- 4) PCB cannot be greater than 12" on either side

Assumptions:

- 1) Base can be moved to a 30 degree angle and still keep the tray level.

Marketing Requirements

- Is lightweight
- Should be able to carry with ease in two hands
- Should be able to rest a lightweight object on the table

Engineering Requirements

Marketing Requirements	Engineering Requirements	Justification
Marketing Requirements <ol style="list-style-type: none"> 1. The device is light weight 2. The device is easily held with two hands 3. The device can hold a lightweight object on the tray 		

