RAPID COMPOSTER

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Sponsors: GSCCC—Summer Helmuth, Matthew Meadows

BACKGROUND

The Girl Scouts of California's Central Coast's Camp Arnaz has an Equine Center housing ten horses on its grounds.

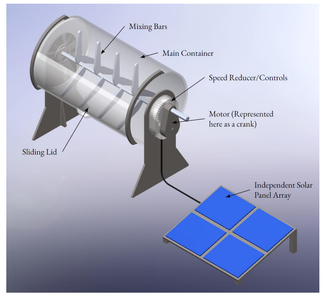
GSCCC wanted a device that would quickly compost their equine biowaste to be used on their grounds as fertilizer.

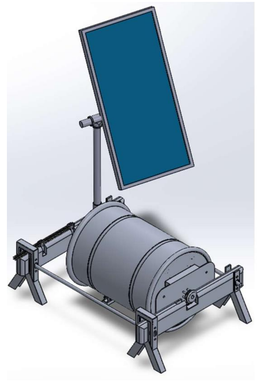
DESIGN PROCESS

Quarter I: Research

CUSTOMER NEEDS	COMPOSTING REQUIREMENTS
50lb/day processing speed	145-160F for 3< days
Withstand environment	30:1 Carbon to nitrogen
Solar-powered	50% Moist
Safe to operate	Neutral pH
Easy/intuitive to use	
Cleanable	
Semi-automated	

Quarter II: Design

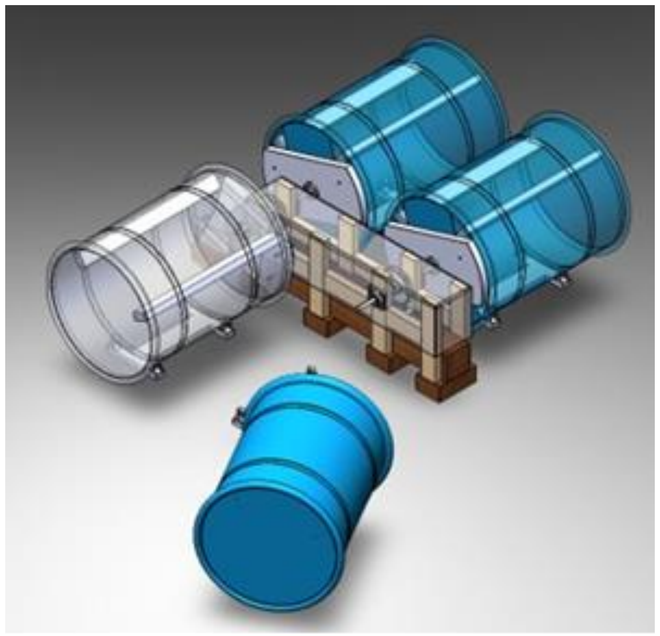




Quarter III: Build

- Part Procurement
- Build
- Assess

FINAL DESIGN CAD

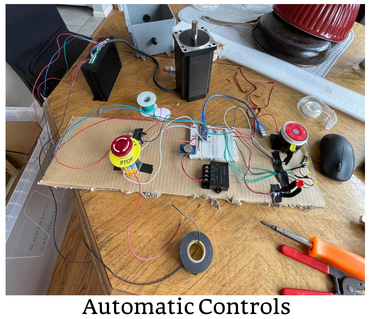


MANUFACTURING

We designed around existing components for ease of manufacturing. Each subsystem (power generation & storage, automatic controls, mounting structure, and aeration) was built independently of one another, then put altogether. Few parts were manually machined.

Power Generation & Storage

Structure + Aeration



Automatic Controls

ACKNOWLEDGEMENTS
Michael Bridgman
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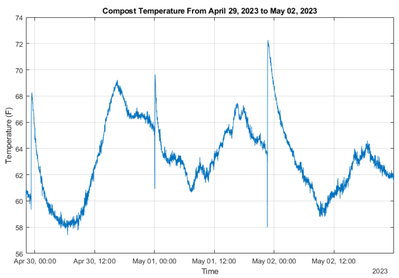
Glunz Family Winery & Cellars

ANALYSIS

To ensure the Rapid Composter meets our sponsor's needs, we set-up five tests to test drum integrity, power requirements, electrical power delivery, mechanical power delivery, and temperature regulation. Below is an image of the temperature regulation test, which shows the optimal temperature has not been reached.



CONCLUSION

Some of the project requirements have not been met yet. There are no controls to regulate moisture, pH, or carbon to nitrogen ratio. Computer programming is not a strong skillset in our group, so a computer engineering team would have been valuable to this project. Manure samples from Camp Arnaz showed a lower carbon to nitrogen ratio and higher moisture content than ideal. These regulations are necessary for optimal composting. These issues must be resolved by the user before the manure is loaded.

There are currently no plans by Cal Poly to continue this project, but there can be minor insulation adjustments to help regulate temperature.