Project Scope

1.1.1 Project Description

The objective of this project is to design, develop, and compete with an autonomous robot that is able to pick up different astral materials (magnetic and nonmagnetic). To optimize point scoring, the astral materials will not be sorted; they will be deposited into one container. The project aims to cohesively use mechanical, computer, and electrical engineering skills and knowledge to create a competition ready robot.

1.1.2 Key Goals

The primary goal of this project is to create a fully autonomous robot whose functions optimize point scoring. The robot will be designed so that the mechanical parts of the robot pick up the materials and store them in a container, while fitting into a start size of 12inx12inx12in. Another goal would be to create a 6-page engineering portfolio for the competition as part of the teams' documents throughout the school year. The team will also work with the ECE team to integrate all systems together.

1.1.3 Markets

The intended primary market for our project is the electrical engineering department at the FAMU-FSU College of Engineering. Under the supervision of Professor Clark, the robot created will represent the college as it competes at Southeast Con. Notable Professors from the electrical engineering department include Professor Harvey and Professor Chuy, both of whom will be involved in aiding team 507 and may benefit from the final product produced.

The secondary market for the robot is future potential Southeast Con competitors at the FAMU-FSU College of Engineering. Team 507 itself benefits from previous projects as an

assembled practice field has been inherited. Furthermore, it is best that team 507's components can be repurposed by future teams.

The tertiary market for the project is any potential employer that might have interest in the outcome of the competition, whether looking for ideas or future employees.

An additional tertiary market for the project is recycling and waste management. IEEE emphasizes sustainability and a robot that identifies and collects material could help with large scale waste management for municipalities.

1.1.4 Assumptions

- The batteries are sensitive and require that the team handle them with care.
- There will be a power source available at the competition.
- The ECE team will be tasked with handling the software components of the robot.
- There will be a dark area and a naturally lit area on the game field. There will be an infrared camera in the cave which impedes certain sensors.
- The astral materials will have the following dimensions: 40mm (about 1.58in) in diameter.
- The astral materials are made of PLA.
- The robot will be operating in a 4'x8' field.
- The robot has 3 minutes to complete its tasks.
- Some of the astral materials will be magnetic (Geodinium), and some will be nonmagnetic (Nebulite). Inside the cave there will be 12 Geodinium and 8 Nebulite. Outside the cave there will be 6 Geodinium and 8 Nebulite.
- The astral materials will be scattered randomly on the play field.

- The starting dimensions for robots are limited to a one-foot cube, but the robot may extend past those dimensions after deployment.
- No illegal materials are allowed. The game manual may be referenced for specific details on what constitutes as illegal materials.
- The containers for depositing astral materials are 6in cubes.
- Points will be earned according to the game manual scoring summary.
- The game manual is up to date.

1.1.5 Stakeholders

A stakeholder is any group or individual who has interest in the outcome of a project.

	Investor	Decision Maker	Advisors	Receivers
Sponsor Dr. Oscar Chuy, Dr. Bruce Harvey	X			X
Manager Dr. Shayne McConomy			X	
Experts Dr. Bruce Harvey, Dr. Clark			X	X
Operators Team 507, ECE Team	X	X	X	X