

MEMORANDUM



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Date: 2/3/24

Subject: ME405 Term Project: Preliminary Design Review

OBJECTIVE:

The object for the term project is to develop a system that can automatically track a target and launch a projectile without user intervention. The launcher will be autonomously aimed and fired with limited user intervention. A supplied thermal infrared camera will be implemented into the system for target acquisition and aiming. The launcher system will fit within a cube 2 feet on each side. The objective is to develop a quick and accurate sentry to win the final duel and uphold the honor of **DARTICUS**.

DESIGN IMPLEMENTATION:

The **Dueling Autonomous infraRed Tracking IronClad Unrivaled Sentry (DARTICUS)** has been designed to meet the requirements listed using a modified NERF Rival Knockout XX-100 Blaster. The sentry will use a series of lubricated turntables to allow for rotation about the Y-axis. The first turntable will be used to rapidly pivot the sentry 180 degrees at the beginning of the duel to face the blaster in the direction of the target. This will be done by attaching a string to one end of the first turntable which will be rapidly wound up by a motor. The first turntable will then slot into the base to give the second turntable a fixed foundation. The second turntable will be used to accurately aim the blaster horizontally. A stepper motor will drive gears that will rotate the second turntable with a fine resolution. If time allows, the angle of the blaster will be directly driven by another stepper motor to angle the blaster at the correct altitude. Otherwise, scope will be reduced to the two prime turntable motors and trigger system. The catch on the blaster spring will be released using a solenoid attached to the trigger lever arm. This will require the blaster to be manually reloaded and the solenoid reset with every shot, so **DARTICUS** will be 100% accurate with every dart. The target will be quickly aimed at and fired upon, and the duel will be won.

CAD DESIGN:

