

Coordinated multi-drone aerial performance development

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Individual Project

The purpose of this project is to create a working model of aerial performance (light show) with multiple drones. Using sensitive GPS antenna equipment, the goal is to have a high-fidelity drone that takes commands from software in order to coordinate flight paths.

Components for the drone needed to be thoroughly researched and selected in order to ensure a high-quality product. The same goes for the software which will be the control APIs that command the flight paths and lights. The project utilizes cutting-edge GPS equipment (F9P) compared to drones that are used currently (M8N). The difference between these two GPS versions is that M8N has a tolerance of 2 meters, while the new F9P has a tolerance of 2 centimeters.

The goal for this project is to expand to multiple drones coordinating with music while performing choreographed light sequences to produce a fluid image from afar. I am doing an MVP, minimum viable product, a “hello world” concept, in order to see if this is possible.

A contributing factor to how this GPS is so accurate is that it requires a sophisticated ground station to communicate to multiple, ~40, satellites from multiple nations: US, EU, Russia, and China.

While using flight path software Ardupilot and Mission Planner to control the drone and using SkyBrush to control the LED lights, C programming language is used to interact with the flight controller that is using ARM.