Flight Board Explanation Video Plan

**Objective:** Present what I’ve done for senior project.

Hi Everyone! My name is Ian Wang and I’m currently a Senior at the International School of Bellevue. My Senior Project is about NearSpace Satellites. I’ll be explaining the Tyee Flight Controller which students will be using and implementing into their satellite, as well as going over some steps regarding how to test and run code on the flight controller.

(Upper body)

(transition to slides)  
Before we start, I’d like to give a bit of detail on what a NearSpace satellite is. A Near space satellite is deployed in typically the lower to upper layers of the Stratosphere to track a variety of data and information about earth. This is achieved through the implementation of Sensor Arrays such as( UV, Humidity, Temperatire, Radiation, Light, and GPS), Sensitive onboard equipment or also a camera to capture pictures/video. Near Space sats are typicallydeployed using weather balloons,. A good example of something from our local community is Husky-Sat 1 from the University of Washington, which is a student-built cube-sat. I’ll post a link in the description below about it. Without further ado, let’s get to understanding the Flight Controller!

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Overview: Here in my hand is a Tyee Flight Controller, as shown on the Printed Circuit Board. There are a variety of components that allow this to capture and store data for your satellite. We will go over each of the separate components in detail.   
  
**Microcontroller (PICAXE 14m2):** The first thing we will go over is the (Picaxe 14m2) Microcontroller which is located (here). The microcontroller is a very primitive computer, it consists of a Processor, RAM, Storage, and I/O pins. A good analogy to put this into perspective is that, the microcontroller would be the “brain” of your satellite.

It’s important to note that the Picaxe 14m2 has (2048 bytes) of storage and (512 bytes) of Memory and provides 12 I/O pins.

\*the next important piece of your satellite is the EEPROM which stands for (Electrically erasable programmable read-only memory” and is located (here)

**EEPROM:** The purpose of the EEPROM is to store the data that your satellite will capture. The reason we use the EEPROM to store data is because as soon as power is disconnected all stored data on the Picaxe is lost. However, if we use the EEPROM if power is disconnected from the flight board, your data will still remain on the chip for retrieval. “your memories”  
Take note that the EEPROM can store 32000 bytes of data, and each reading from a sensor should be a byte.   
  
\*This leads me on into the next component, the 4 sensor ports (B.1, B.2, B.5, C.0)  
**4 Sensor Ports:** Each of these 4 sensor ports is connected to the Microcontroller(here), From these four ports you have the ability to attach up to four sensors using these four ports. (attach four sensors) “5 senses hearing, taste, feeling, smell, sight”

**Power Supply:** The power supply has a number of components which provide power to the Flight Board. Specifically, the voltage regulator (point) provides a fixed output voltage from the power source to the flight controller. This protects the sensitive instruments on the Flight board, preventing excess voltage from damaging them

We then have the:

**Commit Pin**:The is the Commit Pin and it’s how you’ll initiate your program to run. Once this pin is pulled, your satellite should start taking values off the sensors attached. Before your launch you will pull this pin and after retrieval, you’ll push the pin back in the sensors stop taking data.

**Serial Pin:** The Serial Pin is used to upload code/programs or download data. (plug in and plug out)

**Camera Control** This right here is used to control the camera, however you most likely will not be using this as you’ll be using a GOPRO.