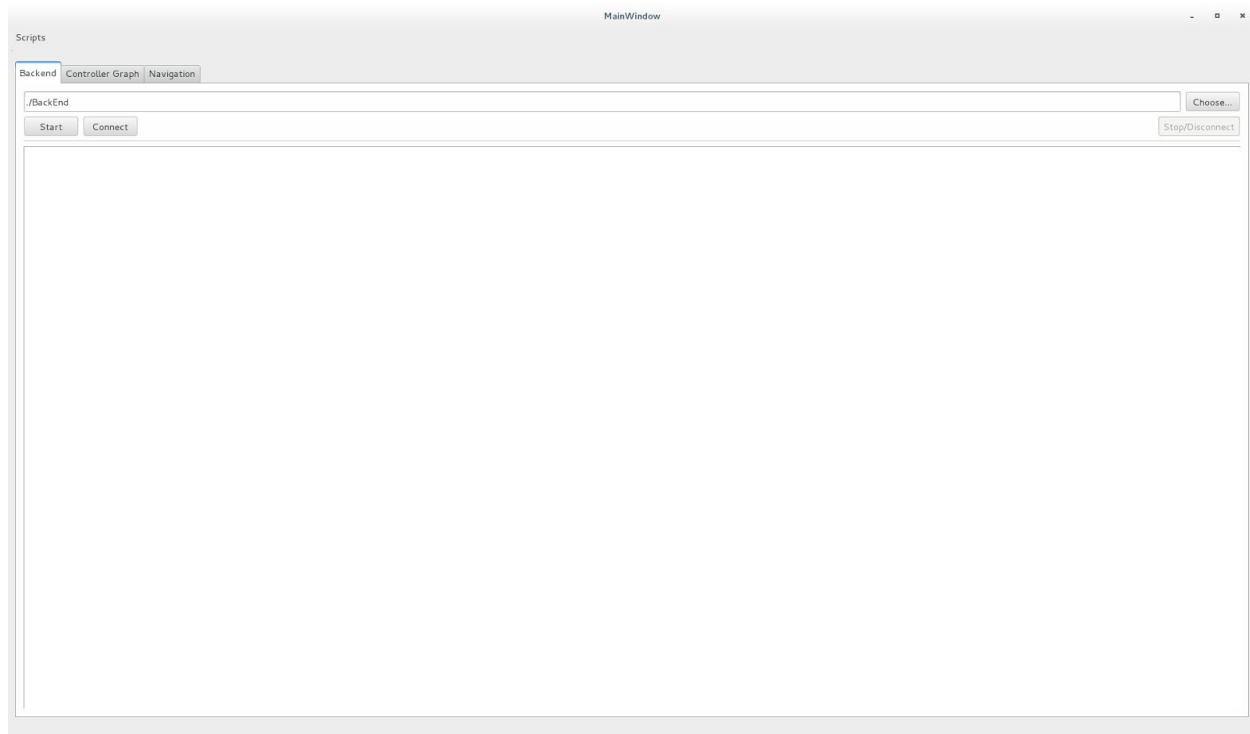


Ground Station GUI Updating

The current GUI while functional is not very well planned out. It does not support all the UI that is currently contained within the GUI and there is a lot of wasted space. We intend for the GUI to be more friendly to users and to be more of a flight assistance/control tool that it is at this moment. The UI will be improved to give the users more control in various created demos and the process of starting a flight will be more streamlined than the current implementation. We will discuss all current windows/tabs with disadvantages and proposed changes as well as new windows that will be added and why they will be added.

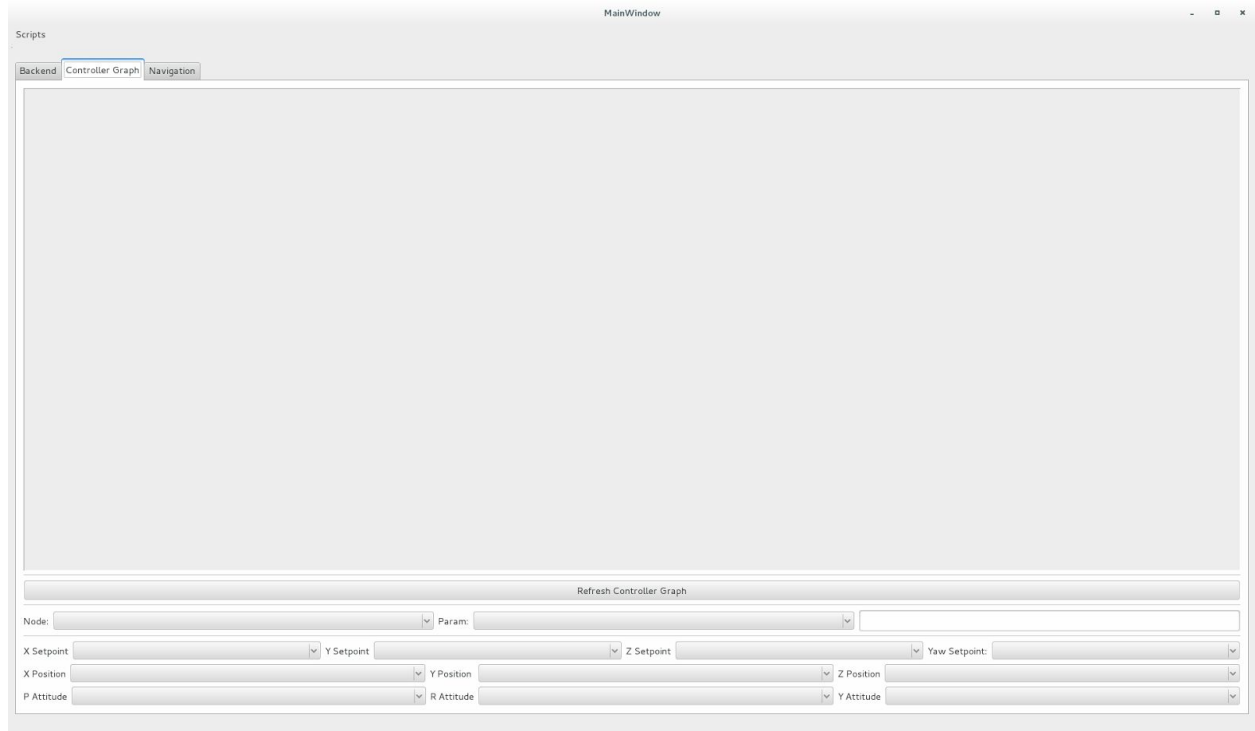
MainWindow and Backend



To start with the MainWindow is rather bare and does not display any flight information. Additionally, scripts while in a place that is easy to get to should not be used before the backend is started, or the control graph is loaded. For this reason it makes more sense to move this into the navigation tab for safety and to conserve space on the screen. The area above the tabs we intend to display flight information such as status to allow the user to see if they are ready to fly and to display the current quad setup.

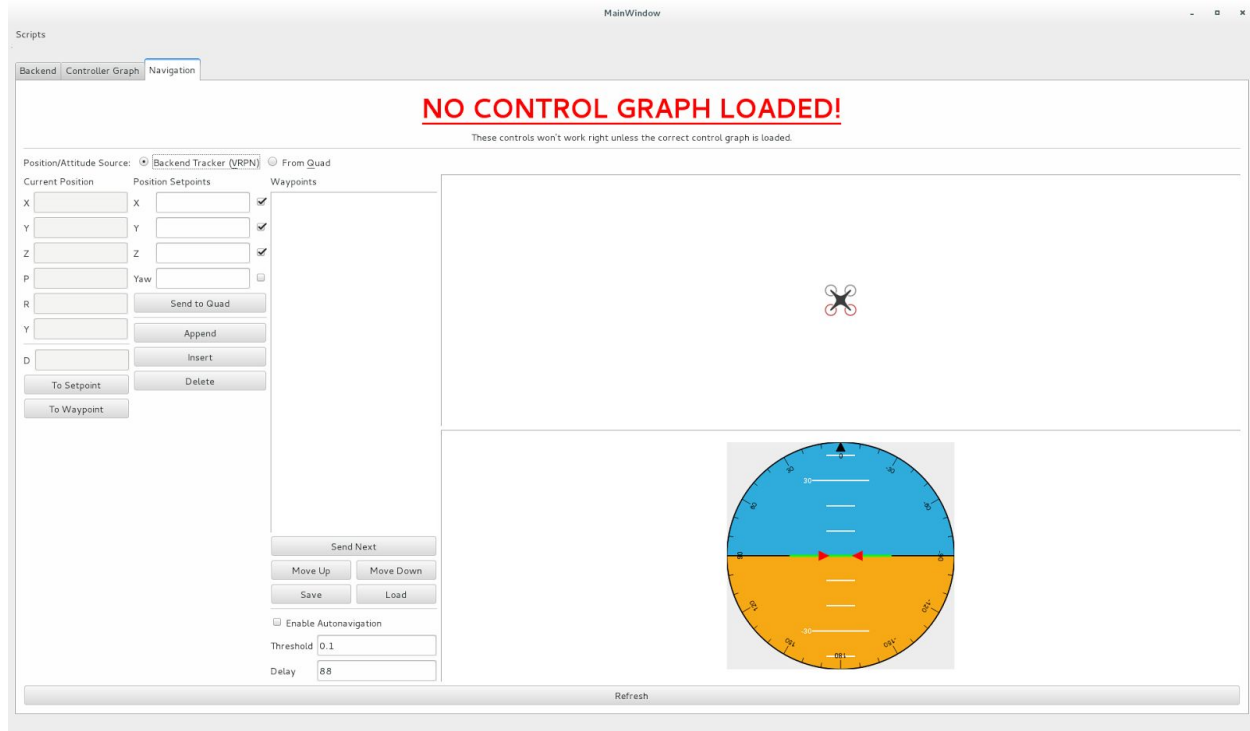
The backend tab itself is important as the backend needs to be started for flight to start. It does not need to occupy a whole tab as the information that it displays is not very useful to those using the system and this will be handled in the navigation/demo tab that will be discussed later in the document. In this way the GUI will automate the flight process more and the user can begin to fly quicker than before.

Controller Graph



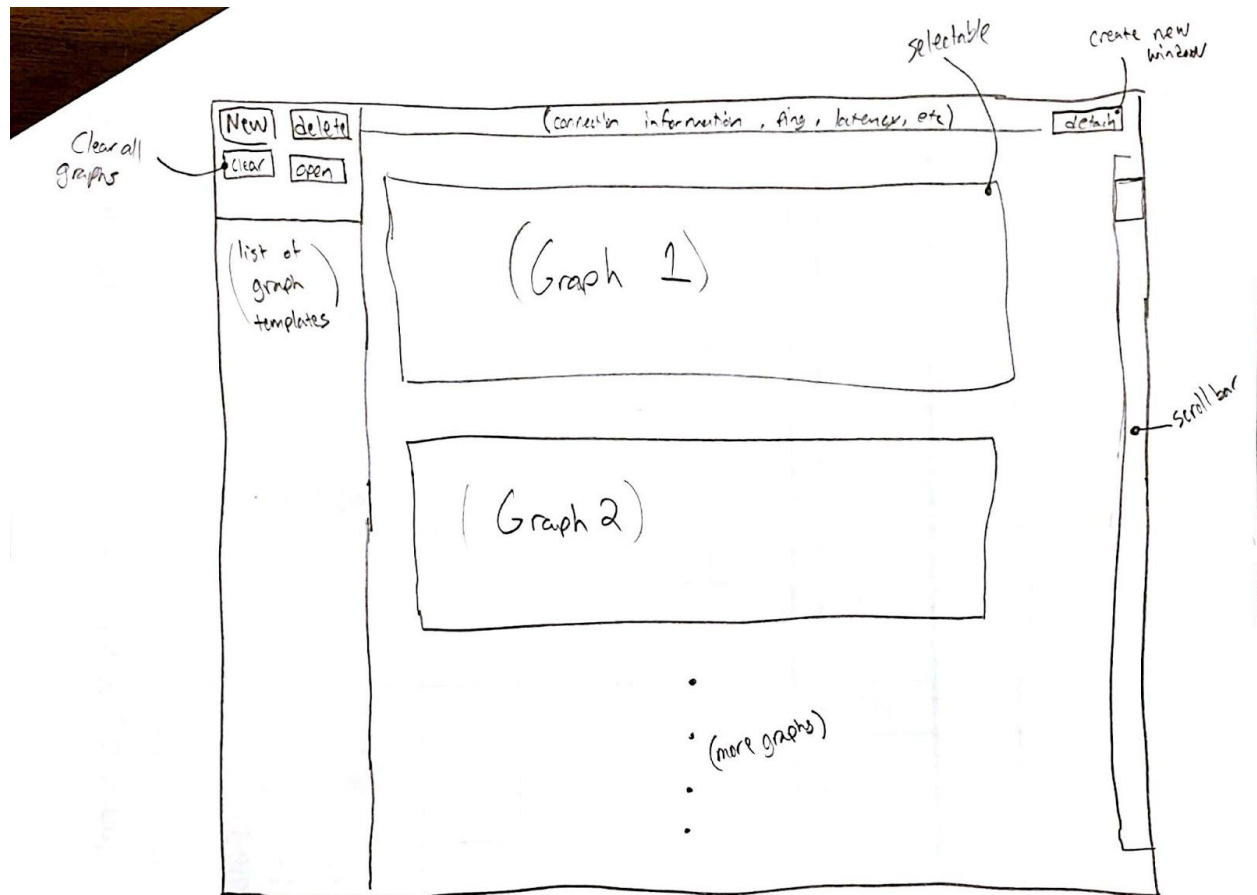
This tab will remain in the new implementation of the GUI. We believe that the visualization of the controls of the quad is beneficial for testing purposes. It is also useful for new users to gain an understanding of the current system. We would like to add some extra functionality into this tab if there is time remaining at the end of this year. Rather than a PNG that is being displayed if the user could change values directly in the boxes and nodes it would be a nice feature and encourage users to get to know the structure of the controls more.

Navigation



Most of the changes will be added to this tab. All of the functionality will remain the same but it will be rearranged and the purpose of the tab itself will change. We would like this to be the first window that is seen by the user and have more information that displays flight readiness and it will also automate the setup process for the user. Information from the backend will be added to this window is a scrollable list like the current backend tab. The usage of scripts will be confined to this window as it is doing the flight setup and monitoring. There will be visual cues added to the UI that allow the user to see connection status, mode information, and possibly battery information depending on the viability of getting battery information. This tab will also display demo specific information and the demos themselves may change the UI slightly to allow for the best user experience. There will be more icons added for the quad window in the top left for when more than one quad is flying within the VRPN. Lastly, we plan to added camera functionality into the GUI if at all possible to allow users to start recording directly from the ground station rather than having to open another application. If this is possible we would also like to look into caching video information for the previous 30 seconds when the user is not recording if they ever forgot. We hope that this feature could be used to catch an event that the user missed because they are not recording.

Real Time Data



The Real Time Data tab will have the ability to display custom graphs to view data coming back from the quad. The configurable graphs will be savable as a template and put into a list so if you are reusing the same graph frequently you won't have to create it from scratch every time. To go with this we will have a useful default graph template that will start with just displaying vrpn data. We would like to have not only quad controls info but also connection info and maybe even battery life. Finally it would be very useful for the Real Time Data to be detachable to fully utilize a two monitor setup. The graphs

CLI

Direct access to the CLI is not available within the GUI as the GUI acts like a separate client than the CLI. This is the intended functionality, but the GUI provides additional information that is not accessible to the CLI and more control of setpoint automation. Also, after discussion with the prior team members and viewing control of the Crazyflies with their ground station implementation it would be nice to use the CLI within the GUI. In this way a user that prefers to use the CLI can still get some of the added benefits of the GUI and users new to the system can start learning more about the command structure of MicroCART.