# Week of 4/7/14

Robin Davis

Accomplishments this week:

Completed initial FMEA of RTx Controller.

Continued PCB layout.

Modified USB port design per review issues.

Significant unexpected issues this week:

Changes on RTx schematic require update of FMEA.

Solutions for these issues, or a brief plan for solving them:

Update is lower priority- will be updated after completion of RTx Controller.

Tasks remaining behind schedule:

Layout of PCB behind schedule.

Tasks for next week:

Complete PCB layout in preparation of review. Begin system FMEA.

Rob Gaskell

Accomplishments this week:

Completed code for Ethernet API functions related to manual control box.

Solved for numerical PID gains for axis control.

Significant unexpected issues this week:

Poles of system transfer function are not as expected, and unstable.

Solutions for these issues, or a brief plan for solving them:

Meeting with Dan Kirkpatrick to resolve controls problem.

Tasks remaining behind schedule:

Dynamic modeling remains behind schedule.

Tasks for next week:

Assist in completion of RTx Controller PCB. Continue dynamic modeling solution and control loop development.

Robert Corkran

Accomplishments this week:

Ethernet transceiver and power-over-ethernet controller completely redone in Eagle, as per Andrew's request to use a part that he preferred over the already chosen and integrated part. The Ethernet section of the RTx controller design document was redone to reflect the new changes of components and specifications.

Significant unexpected issues this week:

The chosen Ethernet switch, which would operate and supply PoE, may no longer be produced or available for purchase, requiring alternative means for supplying power to an Ethernet switch and additional attached devices requiring power from PoE.

Solutions for these issues, or a brief plan for solving them:

Will only know if this is an issue once Andrew gets around to placing an order.

Tasks remaining behind schedule:

Assemble the manual remote and power filter PCB (which hasn't been done since the parts have not been ordered). And high speed signal routing specifications for the board layout.

Tasks for next week:

High speed signal routing. PCB layout of the precharge circuit. Write Ethernet API code for Sightline.

# Week of 3/28/14

Over the last week this is what the individual group members worked on:

*Rob*: Made additional progress on the control theory and has been putting together the Ethernet API. In the coming week he needs to, and will be, continuing work regarding both of those areas.

*Robert* (project manager): Created the schematic for the battery precharge circuit in Eagle. He was able to speak with Andrew regarding the Ethernet PHY who expressed a desire to have incorporated an Ethernet transceiver that he and others had found. In the coming week he will need to incorporate on the controller board a new Ethernet transceiver and begin work on the battery precharge circuit layout.

*Robin*: Did extensive work on the board layout, as well as the FMEA, of the controller board. In the coming week she will continue to work on the board layout and continue investigating any potential points of failure.

The team was able to meet with Andrew and discuss the progress of the project. He was able to bring to their attention some fine tuning that would enhance the overall design and clarity of what had already been done. He commended their work thus far and expressed how pleased he was with the current progress.

# Week of 3/21/14

Over the last week this is what the individual group members worked on:

*Rob*: Worked on the RTx controller board layout in Eagle. In the coming week he will continue working on the firmware.

*Robert* (project manager): Was unable to work on the capstone project due to final projects and exams. In the coming week he will put to schematic the battery precharge circuit.

*Robin*: Continued work on the FMEA for the RTx controller board and documentation for the USB incorporation on the RTx controller board. In the coming week she will work on the FMEA for the system.

Andrew wishes to address some of the component decisions currently implemented in the RTx controller board. The design review will need to be postponed until that meeting takes place, for which Andrew needs to establish when he is available to meet. Until that time, critical tasks for members of the team are to get the board layout set, FMEAs finished, and the precharge circuit & board layout finalized.

# Week of 3/14/14

Over the last week this is what the individual group members worked on:

*Rob*: Has been getting the Ethernet working in the operating system. Finished the dynamic modeling controls.

*Robert* (project manager): Researched high speed signal routing needed for RTx controller PCB layout design.

*Robin*: Worked on the FMEA for the RTx controller board and documentation for the USB incorporation on the RTx controller board.

Time will need to be spent over the next week to make sure the team keeps up with the project schedule. Each team member has had several other exams and projects that have all come to a head at the end of the term. Once finals and projects are finished and submitted, much more time can be devoted to catching up in those areas that are behind.

It is hoped that a design review can be scheduled soon so that the RTx controller board can be finalized.

# Week of 3/7/14

Over the last week this is what the individual group members worked on:

*Rob*: Continued to refine, with help from experienced control theory sources, and implement the control loop code for the automatic control board. He and Robin, in the coming future, will be working to finalize the RTx controller schematic and produce the PCB layout.

*Robert* (project manager): Created a circuit for precharging the large initial capacitance needed for filtering. This will also require a brand new Eagle schematic and board, which was an unknown need at the time of the project schedule but should not delay Robert’s tasks by more than a few days – still keeping his track ahead of the overall project deadline. Considerable testing and learning the uses of the Sightline board were performed throughout the week and also demonstrated to the group in the weekly team meeting.

*Robin*: Researched and chose an enclosure to be used for the controller board. Is producing the FMEA for the RTx controller and will be revising the schematic as needed. Once completed, the layout of the PCB will take place.

The team is currently on schedule with individual assignments and has already sent for printing a couple of the finished circuit boards. Once those are received, they’ll be assembled and tested. With the term coming to a close, however, each of the team members have expressed concern for being able to keep to the schedule and still accomplish all that is needed for other course projects in addition to studying for final exams. Because of this, it is understood by the team that additional time may have to be devoted to this project during the spring break in order to remain on track.

# Week of 2/28/14

The team attended a meeting with Sightline Applications and received video tracking equipment and training.

Over the last week this is what the individual group members worked on:

Rob (technical lead): Completed high-level algorithm for control loop. Began implementation of control loop code.

Robert (project manager): Added additional power supply between the switching and analog reference supplies. Added to Ethernet documentation.

Robin: met with Rob to discuss needs of enclosure as well as the manual controller box. Looked into different types of enclosures

# Week of 2/21/14

Over the last week this is what the individual group members worked on:

Rob (technical lead): Continued to work on modeling of controls to develop PID loop.

Robert: Researched devices to supply 48VDC power and had part approved by Andrew. Worked on system power supply.

Robin (project manager): Schematic and PCB layout of power filter board.

# Week of 02/14/2014

Over the last week this is what the individual group members worked on:

Rob (technical lead): Reviewed Dynamic Modeling and state space control modeling methodologies. Began dynamic modeling of the RocketTracks axes.

Robert: Finished Ethernet schematic. Researched power supply requirements.

Robin (project manager): conducted FMEA on the manual control board. Completed PCB layout of manual control board.

# Week of 02/07/2014

Over the last week our team presented our project proposal to the PSAS group. The presentation went well and feedback was positive.

Over the last week this is what the individual group members worked on:

Rob (technical lead): Finished schematic design of manual controller (ADC filters) for design review.

Robert: Continued research on Ethernet switch, specifically Ethernet transceivers, Ethernet port magnetics, and PoE controllers. Decided on components, created schematic for Ethernet PHY.

Robin (project manager): implemented USB in schematic researched FMEA to begin analysis on manual control board, prepared documentation for FMEA reporting.

# Week of 1/31/2014

Over the last week here are what the individual group members worked on:

Rob (technical lead): Created RTx Controller Design Document, reviewed and completed Axis Position Feedback section. Started design of Manual Remote connector board.

Robert: Research and decide on Ethernet switch (found an Ethernet switch that can support PoE within our budget, still researching Sightline power requirements to determine whether PoE is best option). Continued research on Ethernet PHY implementation.

Robin (project manager): wrote up Project description, adjusted Gantt chart to better fit our project timeline. Research on implementation of USB.

# Week of 1/24/2014

Over the last week here are what the individual group members worked on:

Rob: Trained Robert on Eagle schematic design and new part creation. Researched PSAS Ethernet node-to-node firmware code base. Modified ADC page of RTx Controller Board Schematic.

Robert: Assisted with project scheduling, verified microcontroller decision, researched Ethernet switches, researched Ethernet PHY layer design.

Robin: Gantt chart and worked on project layout and scheduling. Determined initial tasks each member will take and organized overall structure. Set up to present project proposal with PSAS, worked on requirements document.

# Week of 1/17/2014

At this time, our group is beginning research for the various aspects of the project, completing the project design specifications and proposal, as well as creating a task list so that we can move forward with the design project.

Over the last week here are what the individual group members worked on:

Rob: Developed the system level 0 block diagram and controller level 1 block diagram. Attended PSAS meeting and met Andrew Tuesday night. Helped to develop the initial task list.

Robin: created Project Design Specifications document. Attended PSAS meeting and met with Andrew to determine to discuss mechanical component of project. Began work on Gantt chart for scheduling. Worked on high level task list.

Robert: Researched design implementations for the ADC, USB, and Ethernet components of the controller. Was able to confirm the ADC setup that exists is correct. Presented this knowledge at group meeting.