Team Members/Role:
Brandon Beaver – Project Manager
Alec Sutton – Design and Power Team Lead
Cullen White – Power Systems and Logistics Manager
Branden Buhler – Communications and Program Team Lead
George Cleaver – Communications and Controls Advisor
Alexander Somers – Programming and Software Advisor

o **Weekly Summary**
   • **The project team can focus on individualized tasks after the final team contract. The client has provided more direction and the SDR Pluto board, an SDR learning module. This allows the team to experiment with sending signals, beginning with the Communications and Program team. The team also attended the first mock launch, which went very smoothly and served as good practice for interaction with H.A.B.E.T. during a similar launch will go. This closes off all the goals for this past week and gives way to next week's task:** *research, research, research***.**

o **Past week accomplishments**
   - Research
      - George Cleaver:
         - The primary action item accomplished this past week was doing introductory level research on the PLUTO SDR learning module and how it works with MATLAB. This research has prepared me to conduct hands-on tests with the SDR learning module to further understand how it works.
      - Alexander Somers:

- Went over common usecases for GNUradio and examples. Overviewed different builtin GNURadio Companion functions used for those examples and what hardware equivalents they replaced.
- Read Chapters 1-4 of Matthew Nelson's thesis covering a definition of SDR terms, background context on SDR tools (both software and hardware), Specific usage of tools for his thesis, focusing on the SDR and GNURadio portions. Used this to drive my SDR and GNURadio research.
    - Brandon Beaver:
        - Worked with Christine Nelson (program coordinator for Make To Innovate) to gain access to the H.A.B.E.T. Teams and the YouTrack to assign tasks, track time worked, and for documentation purposes.
        - Attended H.A.B.E.T. Mock-launch/workshoped how a typical launch works from the perspective of H.A.B.E.T. And/or H.A.B.E.T.'s clients.
        - Separately met with the client to see what hardware is needed to begin testing ideas for a preliminary design, but more discussion is needed before ordering parts/equipment.
        - Read through Matthew Nelson's SDR thesis to focus on the GNURadio part and hope to spend some time playing with the software to understand how it works in practice.
    - Cullen White:
        - looked more into Software Defined Radio (SDR) and weather balloon launches by reading extra articles. These gave more details and helped understand how things like SDR and weather balloons really work. Checked out what different people had to say, not just sticking to one source. It made the information clearer and more complete.

- **Pending issues**
    - George Cleaver: Slightly behind schedule → Planning on getting physical lab time with the PLUTO board. Unfortunately, that has been delayed and will be moved to an action item for the 2/14 - 2/20 report period. A lab meeting time and location has been arranged.
    - Gain access to past/current documentation and code in the H.A.B.E.T.'s GitHub. This requires the team to make an account on GitHub then be given access by Professor Nelson.
    - Meeting with H.A.B.E.T. Engineering team to review electronics onboard the craft. Targeting a meeting Thursday or Friday
    - Soldering workshop for team members who have not soldered. Time and location TBD.
- **Individual contributions**

NAME	Individual Contributions *(Quick list of contributions. This should be short.)*	Hours this week	HOURS cumulative
Brandon Beaver	● Gave team access to YouTrack, working on H.A.B.E.T.s GitHub and other documentation.	7	13

	• Attended H.A.B.E.T. Mock-launch. • Met with the client to see what hardware is needed • Finished reading Matthew Nelson's SDR Thesis		
Alec Sutton	• Visited the M2I lab and familiarize myself with the space • Refreshed my memory of Linux platforms and commands • attended a HABET launch to see what the process is	4	7.5
Cullen White	• Furthered my research into Software Defined Radio (SDR) and weather balloon launches by exploring additional information from external articles.	3	6
Branden Buhler	• Attended H.A.B.E.T. launch understanding the pre-launch setup, launch process, and post launch debrief. • Learned how to use Linux operating system which the Raspberry Pi runs on. • Reviewed Matt Nelson thesis highlighting key points of the SDR such as using either digital or analog filters and applying some sort of A/D or D/A conversion. • Watched videos on how to use LNAs to connect antenna to SDR to receive images (not much different from video).	4	9.5
George Cleaver	• Attended H.A.B.E.T. mock launch to get more acclimated with the organization and the project that I am working with • Researched PLUTO SDR learning module, specifically how it works in relation to MATLAB. This is preliminary research to hands-on practice in a lab setting with the board. • Updated the team contract to meet the standards requested by instructors/TA.	4.5	10
Alexander Somers	• Read Mattew Nelson's Thesis on SDR. • Attended H.A.B.E.T. launch, observing the pre-launch setup, launch process, and post launch actions. • Researched GNU radio companion and SDR uses. • Attended Linux OS and Raspberry Pi overview. • Researched radio and complications and considerations that come up when designing radiometers and how they impact performance. Also how to measure performance with precision and noise (both internal and external RFI)	6	10.5

o **Comments and extended discussion**

The project team has finally solidified work time and meeting time for each week for a solidified structure, which is great. The new struggle is using time up until now to start working with physical devices to see what has been reviewed over the last week to see how the real signals work in certain scenarios, both perfect and imperfect. Setting up the method for ordering materials to work on/with is the new focus for next meeting and spending time throughout the week getting hands "dirty" with equipment needed for the project. A workshop on soldering is one thing noted in the last meeting, which may be set up for the following week if possible.

- o **Plans for the upcoming week**
    Everyone:
    - Review code and other H.A.B.E.T. resources on github
    - Access YouTrack
    - Soldering Seminar
    - meeting with H.A.B.E.T. Engineering Team

    George Cleaver and Branden Buhler:
    - Meet in one of the on campus labs and conduct various tests with the PLUTO SDR learning module. These tests will be small scale and conceptually building tests to further understanding of SDR. As active engineers on the communications and program team, the focus on the communication aspect specifically in the SDR. Entry level programming will be required, but nothing overly complex. If there are unique software related issues or properties, they will be recorded and reported to the programming and software advisor, Lex Somers. Lex will be continually updated as he is an essential component of the team. See entry level research source on Mathworks *here*. See additional source for data reception *here*.

    Alexander Somers:
    - Install and experiment with GNURadio Companion functions that could be used in the design to replace traditional hardware implemented functions of radio, such as power detection, data smoothing, etc.
    - Gain access to the H.A.B.E.T. github code base. Read through the documentation and code to increase familiarity with the the project's current software development kit and how it can be added and improve upon the current design.
    - Assist George Cleaver and Branden Buhler with PLUTO SDR experimentation and learning for software related issues.
    - Read chapters 5-7 of Matthew Nelson's thesis on SDR.
    - Continue research into SDR and GNURadio capabilities and uses. Begin research on DVBS, focusing on defining what it is and how it is commonly used.

Brandon Beaver:
- Plan a soldering workshop for next week for those who have no/little experience if necessary.
- Assign tasks in YouTrack for the Heimdall project group and try to find time with H.A.B.E.T. Leadership to get more equipment for familiarization with the equipment, i.e. a programmed raspberry pi to use, a copy of the current tracking/video system to see what is currently being used and how it can be improved upon.
- gain access to past documents for H.A.B.E.T., including code in the GitHub page, which will require conversation with the T.A. For the H.A.B.E.T. Project.
- Pester Professor Nelson for access to documentation that *isn't* in the git repository/YouTrack.

Cullen White:
- Start the development of the team's website. Plan to create content by incorporating detailed project descriptions, featuring team members' names and pictures, integrating our weekly reports, and showcasing our ongoing progress on the project.
- Attend the H.A.B.E.T meeting this Friday to learn more about what H.A.B.E.T stands for and what they do

Alec Sutton:
- Meet with HABET member to get further instruction on using our linux platform
- Do more research for third party sources on SDR.

- ○ **Summary of weekly advisor meeting**
  The advisor was unable to meet in-person this week due to family obligations, but a brief summary of the meeting was sent, including notes on what was planned for the next week and what may be needed with regard to the advisor's resources. Next week will cover this week's accomplishments towards the goals for the semester, next week's accomplishments, and what will be planned for the following week.