Griffith UNIVERSITY

Griffith School of Engineering

PROFESSIONAL PRACTICE
ACTIVITY LOG COVER SHEET

1. PERSONAL DETAILS

Griffith identification Number						
5	1	3	8	8	7	7

Family Name:	Barber		
First Name:	Jessy		
Other Names:			
Contact Ph:	0403129984	**Email:**	jessy.barber@griffithuni.edu.au

2. PROFESSIONAL PRACTICE CLAIM

Category	Description	Points
Type I Professional Practice		
A	Junior professional or senior para-professional engineering practice within a professional engineering context and supervised by a professional engineer.	63
Type II Professional Practice		
B	Independent university based engineering research as approved by the course convenor.	
C	Junior para-professional engineering practice within a professional engineering context.	
D	Work experience outside of an engineering context.	
E1	Engineering teaching within University level courses.	
E2	Engineering tutoring/laboratory demonstration within University level courses.	
F	Supervised field trips to engineering related projects.	
G1	Attendance at guest lectures by practicing professional engineers at University.	
G2	Attendance at guest lectures by practicing professional engineers at a professional engineering association.	
	63	**Total**

3. STUDENT SIGNATURE

Student Signature: Jessy Barber	**Date: 14/6/2023**

Notes:
1. Students must accrue a minimum of 60 points of Professional Practice, as set out in the table provided in the Activity Log Guidelines, before submitting the activity log.
2. The total points of Professional Practice claimed may exceed 60 points.
3. The Activity Log Cover Sheet must be signed and dated before submission.

Griffith UNIVERSITY

Griffith School of Engineering

PROFESSIONAL PRACTICE
CATEGORY A PLACEMENT RECORD SHEET

1. PERSONAL DETAILS

Griffith identification Number						
5	1	3	8	8	7	7

Family Name: Barber

Other Names: Jessy

2. PROFESSIONAL PRACTICE PLACEMENT

Period of Placement	From: 21 / 11 / 2023	To: 24 / 2 / 2023	**Days**	63

Organisation Name: Gilmour Space Technologies

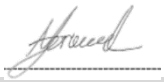
Supervisor Name: Alex Forward **Contact Ph:** +61755492370

Email: alex.forward@gspace.com

Organisation Address: 5 Millenium Circuit Helensvale

(See Note 1)

3. INDUSTRY SUPERVISOR SIGNATURE

Supervisor Signature: (see Note 2) 

Date: 12/6/2023

4. PLACEMENT DESCRIPTION

Your Role: Avionics Intern

Brief Description of Work Undertaken: (Approximately 50 words) (See Note 3)

As an Avionics intern my role was to design, implement and test electronics, software, PCBs and 3D enclosures. This work was primarily focused on developing systems that interact with the propulsion batteries of a rocket and their respective battery management systems. The internship work focused on designing a prototype on a microcontroller, writing software applications in C++, integration testing on a rocket battery, designing and presenting a PCB, designing and writing the assembly procedure for 3D PCB enclosures and communicating with suppliers and manufacturers. Daily work also involved meetings in a professional environment and code reviews, and becoming familiar with in house software and engineering tools.

5. STUDENT SIGNATURE

Student Signature: Jessy Barber **Date:** 14/6/2023

Notes:

1. Complete the Placement Record Sheet for each contiguous period of Category A Professional Practice. See the table provided in the Activity Log Guidelines for the definition of each category of professional practice.
2. The supervisor signature is only required for this Placement Record Sheet for Professional Practice covered by Category A.
3. Provide a brief description of the work undertaken during the Category A Professional Practice Placement.
4. Separate Activity Log Sheets must be provided for each calendar week of professional practice undertaken during this placement.

Griffith UNIVERSITY

Griffith School of Engineering

PROFESSIONAL PRACTICE
CATEGORY A, B & C ACTIVITY LOG SHEET

1. PERSONAL DETAILS

Griffith identification Number						
5	1	3	8	8	7	7

Family Name: Barber

Other Names: Jessy

2. PROFESSIONAL PRACTICE ACTIVITY

CATEGORY (See Note 1): **A**

Days (See Notes 2 & 3): **5**

Week Beginning	**21 / 11 / 22**	**Week Ending**	**25 / 11 / 22**

Supervisor Name: Alex Forward

Contact Ph: +61755492370

Organisation Name: Gilmour Space Technologies

Email: alex.forward@gspace.com

Organisation Address: 5 Millennium Circuit, Helensvale

3. ACTIVITY DESCRIPTION & REFLECTION

Description of Activities Undertaken: (Approximately 50 words)
I researched the theory behind a CAN bus in terms of its physical layout and data transmission. I started planning my project which involved designing software applications and hardware to sniff for battery management system (BMS) data packets being transmitted over a CAN bus network. The packets needed to be decoded into relevant information from the BMSs such as module voltage, cell voltage and cell temperature. The system had to be designed as a read only device and support a data transmission rate of up to 1 Mbps.

Discuss the Engineering Application Abilities Developed: (Approximately 50 words) (See Note 5)
Whilst planning the initial design of my project, I developed my research abilities and knowledge development by studying the inner logic of CAN bus data transmission. I learned about packets, endianness, hexadecimal addressing and protocols for decoding data from CAN frames. I have also developed my skills in C++ within the CLion IDE by learning about Cmake files to organise my project. Overall, I feel that I have extended my knowledge in binary encoding / decoding, packet transmission and programming.

Discuss the Professional and Personal Attributes Developed: (Approximately 50 words) (See Note 5)
Before I started developing the code for my applications, I had to become familiar with the software team's GitLab repository. This required me to learn about Git CLI commands for committing, and about branching commits. I hadn't been involved in a large-scale repo with multiple authors before, so I feel like I have developed my understanding of how companies organise the software they are working on at a large scale.

4. STUDENT SIGNATURE

Student Signature: Jessy Barber

Date: 26/11/22

Notes:
1. See the table provided in the Activity Log Guidelines for the definition of each category of professional practice.
2. For work experience paid on a casual hourly basis, a day of work is taken as 7.25 hours.
3. Only days between Monday and Friday can be counted for research undertaken at Griffith University in Category B Professional Practice, unless prior approval has been granted by the course convenor for 6008ENG.
4. At least one Activity Log Sheet must be provided with each Record Sheet for Professional Practice in categories A, B and C.
5. Refer to the Engineers Australia Stage 1 Competencies.

Griffith UNIVERSITY

Griffith School of Engineering

PROFESSIONAL PRACTICE
CATEGORY A, B & C ACTIVITY LOG SHEET

1. PERSONAL DETAILS

Griffith identification Number						
5	1	3	8	8	7	7

Family Name: Barber

Other Names: Jessy

2. PROFESSIONAL PRACTICE ACTIVITY

CATEGORY (See Note 1): **A**

Days (See Notes 2 & 3): **5**

Week Beginning	**28 / 11 / 22**	**Week Ending**	**2 / 12 / 22**

Supervisor Name: Alex Forward

Contact Ph: +61755492370

Organisation Name: Gilmour Space Technologies

Email: alex.forward@gspace.com

Organisation Address: 5 Millennium Circuit, Helensvale

3. ACTIVITY DESCRIPTION & REFLECTION

Description of Activities Undertaken: (Approximately 50 words)

I was able to apply the previous weeks research to plan software requirements for my applications. After analysing these requirements, I was able to start developing my software applications including the design of test applications to assist my data acquisition process. I was able to get my applications in a working state and could see the data transmission of self-encoded CAN frames into a virtual CAN device defined in a Linux environment, and see decoded messages print to my screen.

Discuss the Engineering Application Abilities Developed: (Approximately 50 words) (See Note 5)

After designing and starting development of my software, I was able to have a better understanding of a systematic approach to an engineering project. This involves seeking out the requirements and scope of the project and using this to ultimately manage a complex task. It was a useful development of my programming ability to understand how software must first be broken down into its functional requirements before writing code.

Discuss the Professional and Personal Attributes Developed: (Approximately 50 words) (See Note 5)

In developing my understanding of software development, I actively sought out advice from software engineers, avionics engineers and systems engineers within the team. In doing so I confidently pursued expert assistance and professional advice. This enlightened me to the benefit of working in a professional team, and the learning experience I can gain from actively seeking information and asking questions. In seeking out this information I was able to develop my understanding of how professional software engineers and systems engineer's breakdown their projects into functional requirements before the coding stage has begun.

4. STUDENT SIGNATURE

Student Signature: Jessy Barber

Date: 3-12-2022

Notes:

1. See the table provided in the Activity Log Guidelines for the definition of each category of professional practice.
2. For work experience paid on a casual hourly basis, a day of work is taken as 7.25 hours.
3. Only days between Monday and Friday can be counted for research undertaken at Griffith University in Category B Professional Practice, unless prior approval has been granted by the course convenor for 6008ENG.
4. At least one Activity Log Sheet must be provided with each Record Sheet for Professional Practice in categories A, B and C.
5. Refer to the Engineers Australia Stage 1 Competencies.

Griffith UNIVERSITY

Griffith School of Engineering

PROFESSIONAL PRACTICE
CATEGORY A, B & C ACTIVITY LOG SHEET

1. PERSONAL DETAILS

Griffith identification Number						
5	1	3	8	8	7	7

Family Name: Barber

Other Names: Jessy

2. PROFESSIONAL PRACTICE ACTIVITY

CATEGORY (See Note 1): **A**

Days (See Notes 2 & 3): **5**

Week Beginning	5 / 12 / 22	Week Ending	9 / 12 / 22

Supervisor Name: Alex Forward

Contact Ph: +61755492370

Organisation Name: Gilmour Space Technologies

Email: alex.forward@gspace.com

Organisation Address: 5 Millennium Circuit, Helensvale

3. ACTIVITY DESCRIPTION & REFLECTION

Description of Activities Undertaken: (Approximately 50 words)
I was able to finish the development of my applications which now included an LCM output message receiver. Since the packet transmission now worked for a virtual CAN socket connection, I started planning the steps for my integration testing in the hardware in the loop (HITL) facility. I also developed my own DBC file and had to work with a manufacturer to gain missing specifications from the BMS data sheet.

Discuss the Engineering Application Abilities Developed: (Approximately 50 words) (See Note 5)
I was able to develop the fluent application of engineering techniques and resources through the development of my LCM receiver application. LCM is a message protocol developed in house and my application used that protocol to repackage CAN frame data into a published LCM network packet. My application then received incoming transmitted LCM packets and displayed a live feed of the decoded values over time. In doing this, I was able to apply existing tools and resources created by the software team with tools that I developed.

Discuss the Professional and Personal Attributes Developed: (Approximately 50 words) (See Note 5)
I was able to represent myself in an orderly way, and with professional conduct as I managed an issue we had with a supplier. The supplier had not provided sufficient information in the data sheet for the BMS which included things like data types and sizes. I had to open a discussion through multiple emails with them, in doing so I had to understand the importance of being a member of a professional community since the company is listed at the bottom of my emails. I was able to understand that I was speaking to the supplier on behalf of the company, and it was my responsibility to maintain a positive working relationship which meant presenting a professional image in all circumstances to a technical colleague.

4. STUDENT SIGNATURE

Student Signature: Jessy Barber

Date: 10-12-2022

Notes:
1. See the table provided in the Activity Log Guidelines for the definition of each category of professional practice.
2. For work experience paid on a casual hourly basis, a day of work is taken as 7.25 hours.
3. Only days between Monday and Friday can be counted for research undertaken at Griffith University in Category B Professional Practice, unless prior approval has been granted by the course convenor for 6008ENG.
4. At least one Activity Log Sheet must be provided with each Record Sheet for Professional Practice in categories A, B and C.
5. Refer to the Engineers Australia Stage 1 Competencies.

Griffith UNIVERSITY

Griffith School of Engineering

PROFESSIONAL PRACTICE
CATEGORY A, B & C ACTIVITY LOG SHEET

1. PERSONAL DETAILS

Griffith identification Number						
5	1	3	8	8	7	7

Family Name: Barber

Other Names: Jessy

2. PROFESSIONAL PRACTICE ACTIVITY

CATEGORY (See Note 1)	**A**	**Days** (See Notes 2 & 3)	**5**

Week Beginning	**12 / 12 / 22**	**Week Ending**	**16 / 12 / 22**

Supervisor Name: Alex Forward	**Contact Ph:** +61755492370
Organisation Name: Gilmour Space Technologies	**Email:** alex.forward@gspace.com
Organisation Address: 5 Millennium Circuit, Helensvale	

3. ACTIVITY DESCRIPTION & REFLECTION

Description of Activities Undertaken: (Approximately 50 words)
I Finished writing the code for my applications this week and made some software documentation. This involved analysing the functional / non-functional, software requirements and creating software diagrams. This was great practise to become familiar with the industry standard of software documentation. I also had my code peer reviewed and was given some constructive criticism. I was able to implement one of the suggestions which was to create a CAN ID generator based on starting hexadecimal address. This was a great addition to my software since I can use any battery module if I know this starting address which a big improvement is over having the ID's hard coded.

Discuss the Engineering Application Abilities Developed: (Approximately 50 words) (See Note 5)
This week I developed my application of systematic engineering synthesis and design processes. This is mostly through my experiences in developing official software documentation and taking part in the code peer review process. This has greatly improved my understanding of the wholistic engineering process. I was able to document commission and report my design outcome and document tests that will verify the performance of my software.

Discuss the Professional and Personal Attributes Developed: (Approximately 50 words) (See Note 5)
I was able to gain experience in effective written communication in a professional domain through my software documentation. I was able to prepare my first high quality engineering document for the purpose of reporting specifications, diagrams, and technical descriptions pertinent to the functionality of my code. This has been a very insightful week in which I have personally grown under my development of this engineering principle. It has given me a much more wholistic understanding of the software design process which will ultimately aid my ability to engineer software in the future.

4. STUDENT SIGNATURE

Student Signature: Jessy Barber **Date: 17-12-2022**

Notes:
1. See the table provided in the Activity Log Guidelines for the definition of each category of professional practice.
2. For work experience paid on a casual hourly basis, a day of work is taken as 7.25 hours.
3. Only days between Monday and Friday can be counted for research undertaken at Griffith University in Category B Professional Practice, unless prior approval has been granted by the course convenor for 6008ENG.
4. At least one Activity Log Sheet must be provided with each Record Sheet for Professional Practice in categories A, B and C.
5. Refer to the Engineers Australia Stage 1 Competencies.

Griffith UNIVERSITY

Griffith School of Engineering

PROFESSIONAL PRACTICE
CATEGORY A, B & C ACTIVITY LOG SHEET

1. PERSONAL DETAILS

Griffith identification Number						
5	1	3	8	8	7	7

Family Name: Barber

Other Names: Jessy

2. PROFESSIONAL PRACTICE ACTIVITY

CATEGORY (See Note 1): **A**

Days (See Notes 2 & 3): **5**

Week Beginning	**19 / 12 / 22**	**Week Ending**	**23 / 12 / 22**

Supervisor Name: Alex Forward

Contact Ph: +61755492370

Organisation Name: Gilmour Space Technologies

Email: alex.forward@gspace.com

Organisation Address: 5 Millennium Circuit, Helensvale

3. ACTIVITY DESCRIPTION & REFLECTION

Description of Activities Undertaken: (Approximately 50 words)
This week I had the opportunity to step my project up to a much higher level. It was discovered that the monitoring of the BMS systems and optical switching of the batteries was high priority for the first launch and so I started diving into PCB design for a new RDAU system. This was my first-time learning PCB design and so this week was dedicated to learning the basics of the software Altium. The first step was to analyse the previous schematics for the existing RDAU systems and start looking for components that would meet my design requirements.

Discuss the Engineering Application Abilities Developed: (Approximately 50 words) (See Note 5)
Since this was my first PCB design, and I was leading the design of this new RDAU system, there was a level of uncertainty and ambiguity for the design requirements which I had to competently address. To do this I had to partition this massive task into management problems and elements for the purpose of designing. I watched many video tutorials, read chapters of textbooks and asked questions when needed to get myself setup with the program. I failed many times but started to see some progress by the end of the week. By Friday I had successfully chosen IC components and successfully added their footprints into an Altium component library.

Discuss the Professional and Personal Attributes Developed: (Approximately 50 words) (See Note 5)
This week I displayed a commitment to life-long learning and professional development through my eagerness to dive into a complex software with zero experience with a determination to become competent in its use. I was especially determined to become competent with Altium and general PCB design because it is a gap in my knowledge and something important that I did not have the opportunity to learn during my studies. I made many mistakes and showed a level of commitment to critical self-review as a I detached my emotions from my designs. This was especially important considering how many errors I made in this first week of using the software.

4. STUDENT SIGNATURE

Student Signature: Jessy Barber

Date: 24-12-2022

Notes:
1. See the table provided in the Activity Log Guidelines for the definition of each category of professional practice.
2. For work experience paid on a casual hourly basis, a day of work is taken as 7.25 hours.
3. Only days between Monday and Friday can be counted for research undertaken at Griffith University in Category B Professional Practice, unless prior approval has been granted by the course convenor for 6008ENG.
4. At least one Activity Log Sheet must be provided with each Record Sheet for Professional Practice in categories A, B and C.
5. Refer to the Engineers Australia Stage 1 Competencies.

Griffith UNIVERSITY

Griffith School of Engineering

PROFESSIONAL PRACTICE
CATEGORY A, B & C ACTIVITY LOG SHEET

1. PERSONAL DETAILS

Griffith identification Number						
5	1	3	8	8	7	7

Family Name: Barber

Other Names: Jessy

2. PROFESSIONAL PRACTICE ACTIVITY

CATEGORY (See Note 1): **A**

Days (See Notes 2 & 3): **4**

Week Beginning	**3 / 1 / 22**	**Week Ending**	**6 / 1 / 22**

Supervisor Name: Alex Forward

Contact Ph: +61755492370

Organisation Name: Gilmour Space Technologies

Email: alex.forward@gspace.com

Organisation Address: 5 Millennium Circuit, Helensvale

3. ACTIVITY DESCRIPTION & REFLECTION

Description of Activities Undertaken: (Approximately 50 words)
After learning the basics of Altium and setting up a project, this week was dedicated to designing the schematics for the PCB. I was able to use my general knowledge from electrical engineering to build the circuits, but the major challenge was learning how all the existing sub systems of the RDAU unit were inter-connected. This was crucial because I had to make sure that my new components were connected properly to the on-board processors, power supply and D-Sub connector.

Discuss the Engineering Application Abilities Developed: (Approximately 50 words) (See Note 5)
This week was especially challenging because I had to understand in my head exactly how the entire RDAU system worked so that I could integrate my own schematics. At the same time, learning the logic behind creating the schematics was equally challenging. Using my previous experiences, I was able to apply technical knowledge and open-ended problem-solving skills to slowly develop my schematics which involved a fair amount of electrical circuit theory. After implementing my new components in an Altium library with their corresponding footprints, I was able to create nets for the pins of these components and connect them to appropriate sub systems such as the processors, power supply and D-Sub connector.

Discuss the Professional and Personal Attributes Developed: (Approximately 50 words) (See Note 5)
I asked many questions this week from my team, and it became extremely evident how important the fundamentals of team dynamics are in an engineering environment. It is one thing to research an issue, but it is more helpful to ask advice from an industry professional. My team was happy to answer any questions I had because I had earned the trust and confidence of my colleagues through the competent and timely completion of tasks. My team was aware of my inexperience, saw how dedicated I was to learn this software and hence was and still are happy to assist any issues I face.

4. STUDENT SIGNATURE

Student Signature: Jessy Barber

Date: 7-1-2023

Notes:
1. See the table provided in the Activity Log Guidelines for the definition of each category of professional practice.
2. For work experience paid on a casual hourly basis, a day of work is taken as 7.25 hours.
3. Only days between Monday and Friday can be counted for research undertaken at Griffith University in Category B Professional Practice, unless prior approval has been granted by the course convenor for 6008ENG.
4. At least one Activity Log Sheet must be provided with each Record Sheet for Professional Practice in categories A, B and C.
5. Refer to the Engineers Australia Stage 1 Competencies.

Griffith UNIVERSITY

Griffith School of Engineering

PROFESSIONAL PRACTICE
CATEGORY A, B & C ACTIVITY LOG SHEET

1. PERSONAL DETAILS

Griffith identification Number						
5	1	3	8	8	7	7

Family Name: Barber

Other Names: Jessy

2. PROFESSIONAL PRACTICE ACTIVITY

CATEGORY (See Note 1): **A**

Days (See Notes 2 & 3): **5**

Week Beginning	**9 / 1 / 22**	**Week Ending**	**13 / 1 / 22**

Supervisor Name: Alex Forward

Contact Ph: +61755492370

Organisation Name: Gilmour Space Technologies

Email: alex.forward@gspace.com

Organisation Address: 5 Millennium Circuit, Helensvale

3. ACTIVITY DESCRIPTION & REFLECTION

Description of Activities Undertaken: (Approximately 50 words)

After developing my schematics last week and getting them reviewed, I was able to finally move on to the PCB design. This was by far the hardest learning curve yet, and I had to learn many new theoretical concepts such as differential pair matching, trace width, tear drops, signal layers, power, and ground planes, polygon pouring, vias and BGA routing. This was also the most enjoyable part of the process for me and seeing all my components on the board and verifying that my dimensions were correct was a massive accomplishment. By the end of the week, I had everything connected and almost ready for a critical design review.

Discuss the Engineering Application Abilities Developed: (Approximately 50 words) (See Note 5)

This week involved as much theoretical research as physical implementation. In doing this I applied established engineering methods to solve a complex engineering problem. For example, I had to investigate the concept of differential pairs in signal routing and use this information to analyse design metrics such as trace width, length, and delay to ensure that CAN high and low signals are received at the same time. I conceptualised alternative engineering approaches after my initial routing attempt failed and had to restart with a new perspective to reach an optimal solution choice. This is because the routing is involved within four signal layers, and the traces cannot overlap. This results in a complex problem of routing many IC chips across the board as efficiently as possible.

Discuss the Professional and Personal Attributes Developed: (Approximately 50 words) (See Note 5)

After having quite a few failures in my initial attempts at the PCB layout I had to adopt a creative, innovative, and pro-active demeanour. Every time I restarted, I came back with more knowledge, and I was better equipped to execute my task. My 2nd and 3rd attempt at routing the system was far more successful than my first. I had to get creative when trying to figure out the most optimal way to route these systems, especially when routing to the BGA since it is so small. I grabbed some paper and a pen and discussed with a co-worker a mathematical model for achieving the most optimal solution using 4 different colours. We eventually arrived at a model which is the basis of my first complete PCB prototype.

4. STUDENT SIGNATURE

Student Signature: Jessy Barber

Date: 14-1-2023

Notes:

1. See the table provided in the Activity Log Guidelines for the definition of each category of professional practice.
2. For work experience paid on a casual hourly basis, a day of work is taken as 7.25 hours.
3. Only days between Monday and Friday can be counted for research undertaken at Griffith University in Category B Professional Practice, unless prior approval has been granted by the course convenor for 6008ENG.
4. At least one Activity Log Sheet must be provided with each Record Sheet for Professional Practice in categories A, B and C.
5. Refer to the Engineers Australia Stage 1 Competencies.

Griffith UNIVERSITY

Griffith School of Engineering

PROFESSIONAL PRACTICE
CATEGORY A, B & C ACTIVITY LOG SHEET

1. PERSONAL DETAILS

Griffith identification Number						
5	1	3	8	8	7	7

Family Name: Barber

Other Names: Jessy

2. PROFESSIONAL PRACTICE ACTIVITY

CATEGORY (See Note 1): **A**

Days (See Notes 2 & 3): **5**

Week Beginning	16 / 1 / 22	Week Ending	20 / 1 / 22

Supervisor Name: Alex Forward

Contact Ph: +61755492370

Organisation Name: Gilmour Space Technologies

Email: alex.forward@gspace.com

Organisation Address: 5 Millennium Circuit, Helensvale

3. ACTIVITY DESCRIPTION & REFLECTION

Description of Activities Undertaken: (Approximately 50 words)
This week was focused on developing and planning a critical design review presentation for my current PCB design. This presentation is a long factor evaluation of the systems and sub-systems of the PCB device, and how it will interact with other systems in the rocket. Some categories include PCB / schematics, bill of materials, thermal / power calculations and functional requirements.

Discuss the Engineering Application Abilities Developed: (Approximately 50 words) (See Note 5)
Developing a CDR is evidence of understanding the role of processes within a culture of continuous improvement since it is rooted philosophically in the continued improvement of the PCB design. The point of the presentation is to meet with heads of departments and analyse the design and discuss where it can be reviewed or changed. Since this device is critical hardware, it is imperative that the design undergoes a satisfactory review process, which starts with a CDR and PDR. Developing the CDR also required me to think critically about my project which allowed me to catch some last-minute errors.

Discuss the Professional and Personal Attributes Developed: (Approximately 50 words) (See Note 5)
The development of a CDR has thus far been a great experience in developing high quality engineering documents, specifically a presentation that is pertinent to the engineering discipline. A critical design review is common in the engineering discipline, and it has been a massive learning experience for me to see what the review process is like for an engineered design / product. This is the first time I have been a part of such review process since usually developing a product / design is the last phase in university. This experience has given me greater insight to the engineering process as a whole and makes me a more experienced engineer in general since I can take the insight from the review process into the prototyping of future products.

4. STUDENT SIGNATURE

Student Signature: Jessy Barber

Date: 21-1-2023

Notes:
1. See the table provided in the Activity Log Guidelines for the definition of each category of professional practice.
2. For work experience paid on a casual hourly basis, a day of work is taken as 7.25 hours.
3. Only days between Monday and Friday can be counted for research undertaken at Griffith University in Category B Professional Practice, unless prior approval has been granted by the course convenor for 6008ENG.
4. At least one Activity Log Sheet must be provided with each Record Sheet for Professional Practice in categories A, B and C.
5. Refer to the Engineers Australia Stage 1 Competencies.

Griffith UNIVERSITY

Griffith School of Engineering

PROFESSIONAL PRACTICE
CATEGORY A, B & C ACTIVITY LOG SHEET

1. PERSONAL DETAILS

Griffith identification Number						
5	1	3	8	8	7	7

Family Name: Barber

Other Names: Jessy

2. PROFESSIONAL PRACTICE ACTIVITY

CATEGORY (See Note 1): **A**

Days (See Notes 2 & 3): **4**

Week Beginning	23 / 1 / 2023	Week Ending	26 / 1 / 2023

Supervisor Name: Alex Forward

Contact Ph: +61755492370

Organisation Name: Gilmour Space Technologies

Email: alex.forward@gspace.com

Organisation Address: 5 Millennium Circuit, Helensvale

3. ACTIVITY DESCRIPTION & REFLECTION

Description of Activities Undertaken: (Approximately 50 words)
This week was focused on finishing my CDR presentation slides and conducting my CDR presentation for my PCB design. This was a two-hour presentation highlighting all the design choices and implications of my design to my lead engineer, head engineer and an avionic engineer. This CDR is what determined whether the project was worth funding and placing in the rocket, and whether the design was robust enough for a flight critical mission.

Discuss the Engineering Application Abilities Developed: (Approximately 50 words) (See Note 5)
Conducting the critical design review was an example of applying systematic engineering synthesis and design processes since the entire presentation was based on my holistic system design including cost targets (component and fabrication costs), identifying and assessing technical health and safety risks of my circuit layout and PCB design and defining the acceptance criteria for future software implementations on my board. This presentation took the form of a discussion, and much feedback was offered. In the end it was a successful presentation, and the project was greenlit after I worked to implement the design changes recommended by the team.

Discuss the Professional and Personal Attributes Developed: (Approximately 50 words) (See Note 5)
This presentation served to greatly develop my oral communication skills in a professional domain. It was an intense experience to present such a technical design to highly knowledgeable engineers, but it was an experience that taught me a lot about their thought processes, safety standards and acceptance criteria. In conducting the presentation, I effectively presented a high-quality engineering document, and was required to speak confidently and comprehend critically, and fairly the viewpoints of others through discussion format, understanding and discussing their recommendations, and considering practical implementations of these for the final PCB design.

4. STUDENT SIGNATURE

Student Signature: Jessy Barber

Date: 27/1/2023

Notes:
1. See the table provided in the Activity Log Guidelines for the definition of each category of professional practice.
2. For work experience paid on a casual hourly basis, a day of work is taken as 7.25 hours.
3. Only days between Monday and Friday can be counted for research undertaken at Griffith University in Category B Professional Practice, unless prior approval has been granted by the course convenor for 6008ENG.
4. At least one Activity Log Sheet must be provided with each Record Sheet for Professional Practice in categories A, B and C.
5. Refer to the Engineers Australia Stage 1 Competencies.

Griffith UNIVERSITY

Griffith School of Engineering

PROFESSIONAL PRACTICE
CATEGORY A, B & C ACTIVITY LOG SHEET

1. PERSONAL DETAILS

Griffith identification Number						
5	1	3	8	8	7	7

Family Name: Barber

Other Names: Jessy

2. PROFESSIONAL PRACTICE ACTIVITY

CATEGORY (See Note 1): **A**

Days (See Notes 2 & 3): **5**

Week Beginning	**30 / 1 / 2023**	**Week Ending**	**3 / 2 / 2023**

Supervisor Name: Alex Forward

Contact Ph: +61755492370

Organisation Name: Gilmour Space Technologies

Email: alex.forward@gspace.com

Organisation Address: 5 Millenium Circuit Helensvale

3. ACTIVITY DESCRIPTION & REFLECTION

Description of Activities Undertaken: (Approximately 50 words)
This week was focused on taking the insight from the critical design review and applying these changes to my PCB. This included a reworking of the EMI and ESD protection, some trace routing and choosing a different optocoupler component due to a thorough analysis of the system current draw. These changes were added to an updated design review slide pack and sent to the review team.

Discuss the Engineering Application Abilities Developed: (Approximately 50 words) (See Note 5)
The iterative process of design for this PCB via the design review was an example of systematic engineering design, proficiently applying technical knowledge and open-ended problem solving to fix design issues that were present with the initial PCB design. This experience has opened my eyes to the importance of iterative system design for electronics and how important from design review is in the context of holistic system design.

Discuss the Professional and Personal Attributes Developed: (Approximately 50 words) (See Note 5)
To solve the EMI and ESD issues with the PCB, and to gain a greater understanding of the component current draw from the processor I really had to become closely familiar with electromagnetic design and electronic theory in terms of PCB design. This was an example of being aware of the broader fields of science as electromagnetism, electro-static discharge and radio frequency design are complex topics that greatly influence the design of electronics. Attaining a grasp of these theories I was able to redesign my PCB whilst adhering to physical constraints, developing new ideas from professionals in other fields, such as the lead radio frequency engineer, to finalize the design of my PCB.

4. STUDENT SIGNATURE

Student Signature: Jessy Barber

Date: 4/2/2023

Notes:
1. See the table provided in the Activity Log Guidelines for the definition of each category of professional practice.
2. For work experience paid on a casual hourly basis, a day of work is taken as 7.25 hours.
3. Only days between Monday and Friday can be counted for research undertaken at Griffith University in Category B Professional Practice, unless prior approval has been granted by the course convenor for 6008ENG.
4. At least one Activity Log Sheet must be provided with each Record Sheet for Professional Practice in categories A, B and C.
5. Refer to the Engineers Australia Stage 1 Competencies.

Griffith UNIVERSITY

Griffith School of Engineering

PROFESSIONAL PRACTICE
CATEGORY A, B & C ACTIVITY LOG SHEET

1. PERSONAL DETAILS

Griffith identification Number						
5	1	3	8	8	7	7

Family Name: Barber

Other Names: Jessy

2. PROFESSIONAL PRACTICE ACTIVITY

CATEGORY (See Note 1): **A**

Days (See Notes 2 & 3): **5**

Week Beginning	6 / 2 / 2023	Week Ending	10 / 2 / 2023

Supervisor Name: Alex Forward

Contact Ph: +61755492370

Organisation Name: Gilmour Space Technologies

Email: alex.forward@gspace.com

Organisation Address: 5 Millenium Circuit Helensvale

3. ACTIVITY DESCRIPTION & REFLECTION

Description of Activities Undertaken: (Approximately 50 words)
This week I become familiar with mechanical CAD design for the purpose of training me to build an enclosure for my PCB. This was the next logical step in the engineering process for electronics and was greatly beneficial for me to add to my skillset. I was taught the basics of how to use a program called OnShape and started by mocking up enclosures for previous electronics. Finally, I was able to build an enclosure for remote data acquisition devices in a stack formation and get these fabricated.

Discuss the Engineering Application Abilities Developed: (Approximately 50 words) (See Note 5)
After becoming familiar with mechanical CAD design, I was able to put another engineering tool in my skillset. During the process of learning this software I was able to effectively apply an engineering tool to analyse and visualize a 3D design. The software involves gaining a grasp of 2D CAD drawings and extruding these drawings into 3D objects which involves having a firm grasp on mechanical design, measurements and structural design. Having a grasp on the structural design is important for designing enclosures so that they are capable of being fabricated or 3D printed.

Discuss the Professional and Personal Attributes Developed: (Approximately 50 words) (See Note 5)
Since learning this software involved a lot of self-learning, I had to adopt a creative demeanour in order to apply creative approaches to developing a 3D object. This included becoming more familiar with CAD drawing and thinking about the 3D object in my head to meet the safety requirements for installation on the rocket. The PCB had to fit perfectly in the enclosure, and multiple enclosures had to be stacked and secured together so I really had to think technically about the mechanical design from a thermal and electromagnetic perspective.

4. STUDENT SIGNATURE

Student Signature: Jessy Barber

Date: 11/2/2023

Notes:
1. See the table provided in the Activity Log Guidelines for the definition of each category of professional practice.
2. For work experience paid on a casual hourly basis, a day of work is taken as 7.25 hours.
3. Only days between Monday and Friday can be counted for research undertaken at Griffith University in Category B Professional Practice, unless prior approval has been granted by the course convenor for 6008ENG.
4. At least one Activity Log Sheet must be provided with each Record Sheet for Professional Practice in categories A, B and C.
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Griffith UNIVERSITY

Griffith School of Engineering

PROFESSIONAL PRACTICE
CATEGORY A, B & C ACTIVITY LOG SHEET

1. PERSONAL DETAILS

Griffith identification Number						
5	1	3	8	8	7	7

Family Name: Barber

Other Names: Jessy

2. PROFESSIONAL PRACTICE ACTIVITY

CATEGORY (See Note 1): **A**

Days (See Notes 2 & 3): **5**

Week Beginning	13 / 2 / 2023	Week Ending	17 / 2 / 2023

Supervisor Name: Alex Forward

Contact Ph: +61755492370

Organisation Name: Gilmour Space Technologies

Email: alex.forward@gspace.com

Organisation Address: 5 Millenium Circuit Helensvale

3. ACTIVITY DESCRIPTION & REFLECTION

Description of Activities Undertaken: (Approximately 50 words)

This week my enclosures were fabricated, and I was tasked with making an assembly procedure and heading down to the other building, sitting with the electrical technicians and putting together the enclosures. This was a direct feedback loop as I was in the room with the assembly team and able to receive direct design criticism and feedback. Putting the enclosures together myself also gave me critical hands-on experience that was able to give me even more insight for the enclosure design phase.

Discuss the Engineering Application Abilities Developed: (Approximately 50 words) (See Note 5)

Designing an assembly procedure was a new key ability I was able to develop using the in-house software that acts as an assembly instruction manual. This involved formulating step-by-step instructions for the assembly procedure and including the fastening components with diagrams. I was then able to see what steps I missed or needed improving by sitting with the technician team and following my assembly procedure. This gave me an opportunity to lead a whole system design cycle and allowed me to develop an understanding of the systematic approach to engineering design. I was able to amend my assembly instructions with missing technical and design requirements to achieve a functional and well-documented assembly procedure.

Discuss the Professional and Personal Attributes Developed: (Approximately 50 words) (See Note 5)

Sitting with the technicians and assembling my own design was an amazing experience because it gave me the opportunity to be self-critical about my own design and helped me understand the importance of being a member of a professional team on a larger scale. The technicians had valuable insights from their experience assembling avionics devices and enclosures and I was able to draw upon that to assist me in future enclosure designs.

4. STUDENT SIGNATURE

Student Signature: Jessy Barber

Date: 18-2-2023

Notes:

1. See the table provided in the Activity Log Guidelines for the definition of each category of professional practice.
2. For work experience paid on a casual hourly basis, a day of work is taken as 7.25 hours.
3. Only days between Monday and Friday can be counted for research undertaken at Griffith University in Category B Professional Practice, unless prior approval has been granted by the course convenor for 6008ENG.
4. At least one Activity Log Sheet must be provided with each Record Sheet for Professional Practice in categories A, B and C.
5. Refer to the Engineers Australia Stage 1 Competencies.

Griffith UNIVERSITY

Griffith School of Engineering

PROFESSIONAL PRACTICE
CATEGORY A, B & C ACTIVITY LOG SHEET

1. PERSONAL DETAILS

Griffith identification Number						
5	1	3	8	8	7	7

Family Name: Barber

Other Names: Jessy

2. PROFESSIONAL PRACTICE ACTIVITY

CATEGORY (See Note 1): **A**

Days (See Notes 2 & 3): **5**

Week Beginning	20 / 2 / 2023	Week Ending	24 / 2 / 2023

Supervisor Name: Alex Forward

Contact Ph: +61755492370

Organisation Name: Gilmour Space Technologies

Email: alex.forward@gspace.com

Organisation Address: 5 Millenium Circuit Helensvale

3. ACTIVITY DESCRIPTION & REFLECTION

Description of Activities Undertaken: (Approximately 50 words)
This week I was able to send my PCB to the manufacturer and open a professional engineering dialogue with their support team. This was a complex PCB, so the manufacturer was Australian based and required back-and-forth communication for issues faced with fabrication. I was also able to conduct integration testing for my first prototype on the microcontroller with a rocket battery and BMS in the Avionics HITL room and confirm the functionality of my software against my requirement criteria.

Discuss the Engineering Application Abilities Developed: (Approximately 50 words) (See Note 5)
Testing my prototype electronics and software in the HITL room was my first major experience with integration testing and allowed me to evaluate the outcomes and effectiveness of my software against my criteria and software requirements. I learned a new skill called SSH in which I was able to use the CLion IDE to remote directly into my microcontroller and upload my applications wirelessly. I then setup the closed loop integration test and was able to verify that my software worked exactly as intended. I even used LCM viewer to plot live readings from the battery and was satisfied with the software design for the first prototype.

Discuss the Professional and Personal Attributes Developed: (Approximately 50 words) (See Note 5)
Sending my PCB off to the manufacturer and discussing design requirements with them was my first major experience in professional conduct with a major engineering project. This was an experience that allowed me to gain insight into the communication standard used between high-level engineers and manufacturers and refined my approach to presenting myself with a professional image under all circumstances with relation to technical colleagues in different engineering professions.

4. STUDENT SIGNATURE

Student Signature: Jessy Barber

Date: 25/2/2023

Notes:
1. See the table provided in the Activity Log Guidelines for the definition of each category of professional practice.
2. For work experience paid on a casual hourly basis, a day of work is taken as 7.25 hours.
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4. At least one Activity Log Sheet must be provided with each Record Sheet for Professional Practice in categories A, B and C.
5. Refer to the Engineers Australia Stage 1 Competencies.