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# DOR-15

## Final Design Project Progress Report

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MEEG-112 Engineering Graphics and CAD  
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2024-12-18

## Project Summary

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# 1 Introduction

For this project, we were tasked with creating a functioning drone to be a kid's toy. As a group, we took on the task with the planning to bring forth our version of a drone-like device that appeared in Meet the Robinsons. This device is known as DOR-15 and is depicted as a sentient hat that accompanies a time traveler and can apparently levitate. Seeing how levitation is not something we are currently equipped to re-create we went along and designed a concept sketch which highlights propellers. This project can show the development of something that we may see as simple and shows us the challenges of bringing an idea we have to life. By showing the many steps this process takes to get right, we have learned a lot and have grown as CAD designers, hoping to further improve upon our ideas and turn them all into reality.

## 2 Background Research

During this endeavor of creating a drone from a mere drawing on a notebook to our group bringing forth a functioning and well-thought-out drone design, we have come across a large amount of information that has helped us develop this project nicely. To begin, our entire design is based off of a hat-like drone from a children's movie, and with the help from our lectures and slides, we were able to get the groundwork started with the development of implicating propellers to give us optimal steering and flight predictability. We had to think about the logistics of a concave drone that would work. For the more complicated piece of the project, such as the propeller, we used a YouTube tutorial to get a baseline for what we needed to do to bring the most crucial step of our drone to life.

While the design may seem to be the most important part of the process, there is also a need to leave a way to replicate the part and to be able to confirm that this whole idea can even work. During our discussions as a group, we came to a conclusion that we would need to have force fits between the drone body and the propellers and their connectors to ensure that we would get the best use out of them. We found what the best fits were using our tolerance and fits lecture slide to find the dimensions needed and the tolerances to follow to maximize the parts' capability. Moreover, we used all of these resources to ensure that we could successfully replicate and consistently uphold this drone to a degree in which it would not only work but could work for mass distribution.

### 3 Concept Design

To generate our preliminary design, we simply thought of an initial idea, implicated a change to the initial design that we thought was feasibly possible. Then, with some modifications, we came across the first roadblock of accurately sizing every individual piece so that they could mesh together to create a functioning body. We used the insight to first create our own individual parts to the specific sizes we intended, and then during the assembly phase of the project, we encountered the struggle of the differing sizes in our own vision, which in turn caused heavy modifications for the drone to not only function but to even be plausible. After various trials during assembly, we came across our final design, which we stuck through till the end so we could make the best and most functioning drone we could come up with.

#### 3.1 Product Specifications

#### 3.2 Details of the Design

#### 3.3 Tolerance and Fit

## 4 Project Management

Some upcoming tasks that we have planned are our assembly of our drone in Solidworks and drawing creation. We plan to achieve this following the thanksgiving break on 11/28. We want to make sure all our drone parts are done and completed prior to the final deadline to give our team plenty of time to resolve issues before finals. All main components have been completed and modeled.

Task Name	Start	End	Duration	Status	Dependent Tasks	Assigned
Concept Sketch	10/30	10/30	00:02:00	Complete	N/A	Grant/Huy
Components Design	11/07	11/21	14:00:00	Complete	N/A	All Members
Assembly	11/21	11/28	07:00:00	Complete	N/A	Huy/Devin
Detailed Drawings	11/07	11/21	14:00:00	Complete	N/A	Grant
Assembly Drawings	11/21	11/28	07:00:00	Complete	N/A	Grant
Motion Analysis	12/05	12/5	00:05:00	Complete	N/A	Huy
Report	11/07	12/05	14:00:00	Complete	N/A	All Members
Video	12/05	12/05	00:05:00	Complete	N/A	All Members

Table 1: Project Schedule as of 2024-12-18



## 5 Conclusion

Our team believed that a hat based on Doris, from the movie "Meet the Robinsons", would be a fun way to make a drone that would sell well in the holiday season. Some rough concept sketches were created, and from there we started designing. The project changed from the original design sketch, but the core concept remained.

In the future, our group would like to add a camera on the front of the drone, as currently the "eye" serves no function. Another enhancement would be a better system for the propellers. The current propeller configuration only allows for a very limited range of motion. An interesting direction that was discussed and is a potential future project would be to lean more heavily on the hat component and design a drone that interfaces with different types of hats to create a drone that can turn any hat into a flying hat.

Due to the limited time and lack of know-how, we were unable to design the internal circuitry for the drone. So, if there were more time and information on circuitry and drone motors, we would have been able to design the internal circuitry for the drone.

## 6 References

- [1] Fandom contributors. Meet the robinsons — disney fandom, 2024. Accessed: 2024-12-17.
- [2] Solidworks Fun. Solidworks tutorial: Propeller designing in solidworks, 2024. Accessed: 2024-12-17.
- [3] Wikipedia contributors. Meet the robinsons — wikipedia, the free encyclopedia, 2024. Accessed: 2024-12-17.

## 7 Acknowledgments

## A Concept Sketches

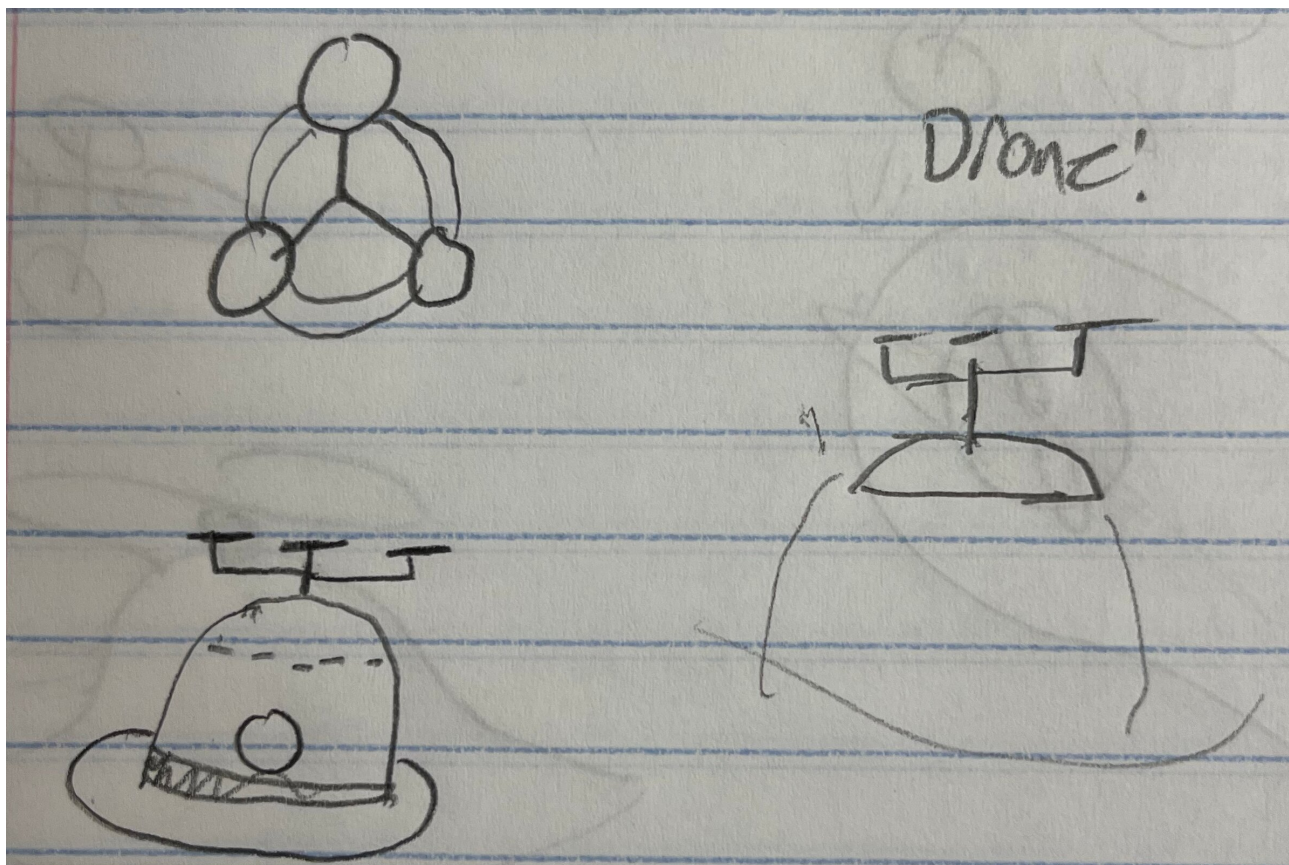
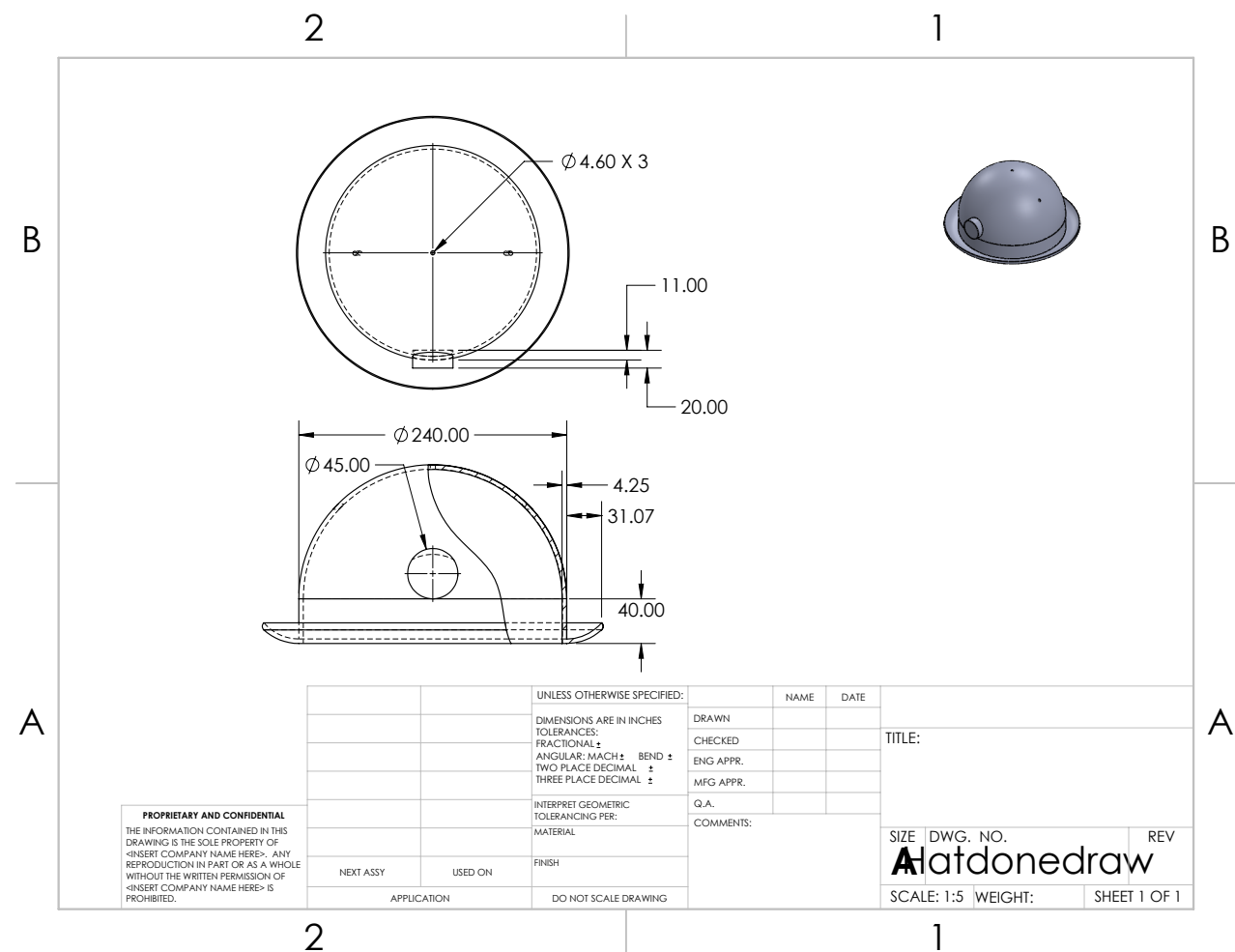
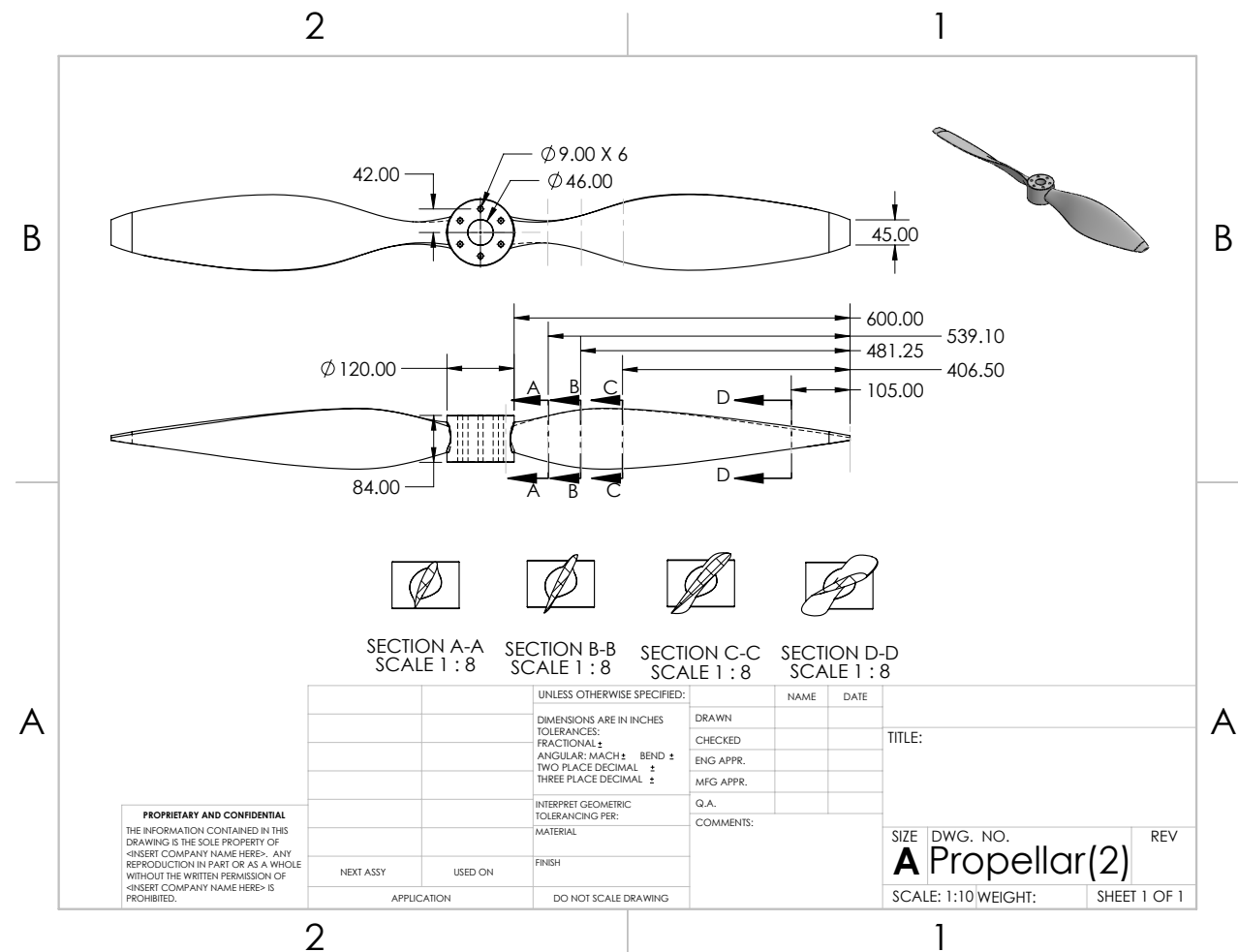


Figure 1: Concept Sketch Created on 11-7-2024

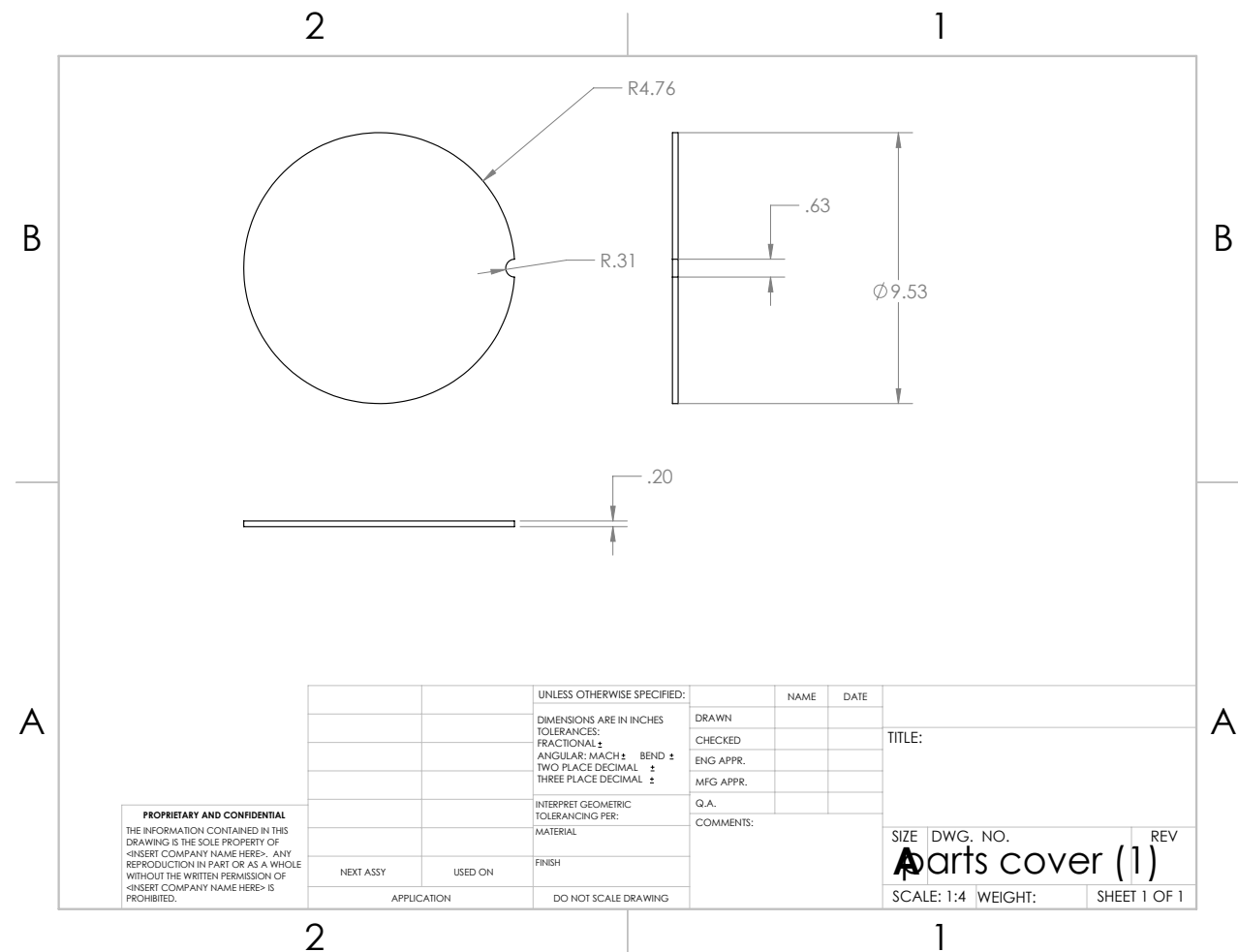
B CAD Models and Dimensioned Drawings



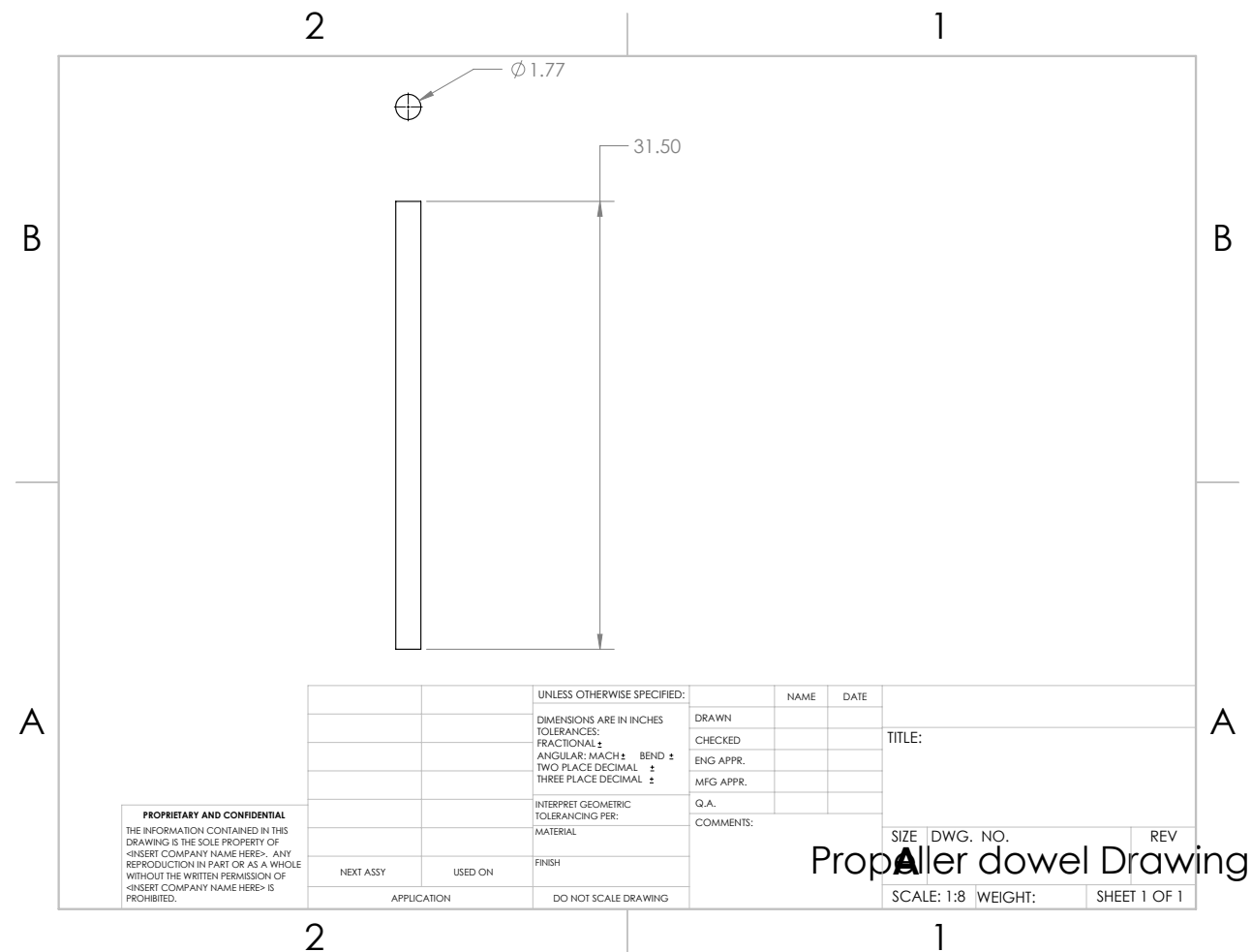
Detailed Drawing of Hat Body



Detailed Drawing of Propeller



Detailed Drawing of Parts Cover



Detailed Drawing of Dowel