

UNIVERSITY OF MORATUWA, SRI LANKA

Faculty of Engineering



Department of Electronic and Telecommunication Engineering

Semester 4 (Intake 2020)

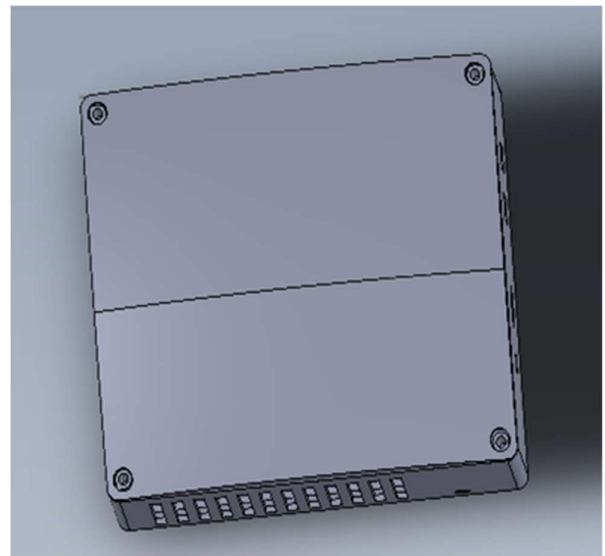
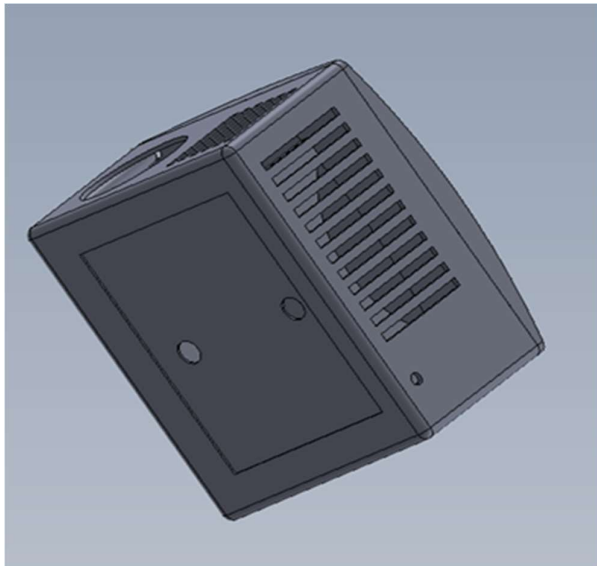
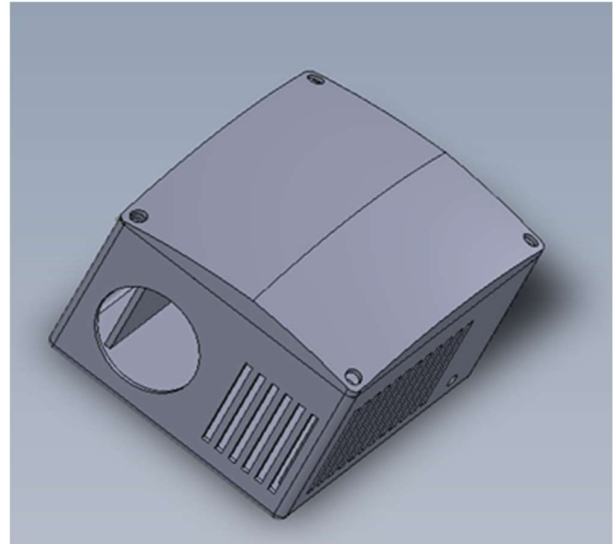
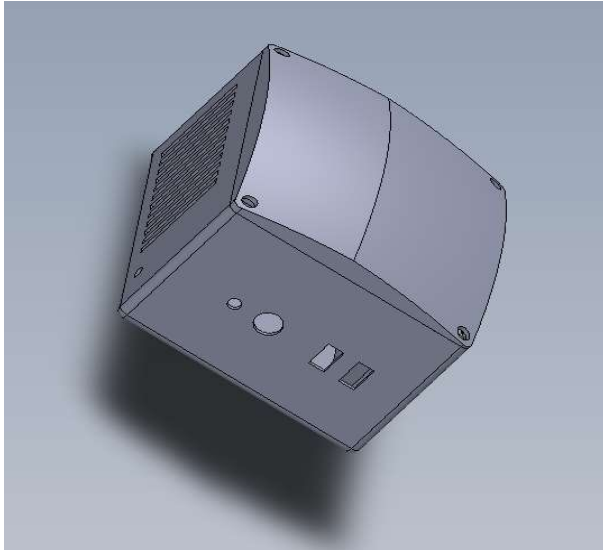
EN2160 - Electronic Design Realization

Report – Preliminary Design Part

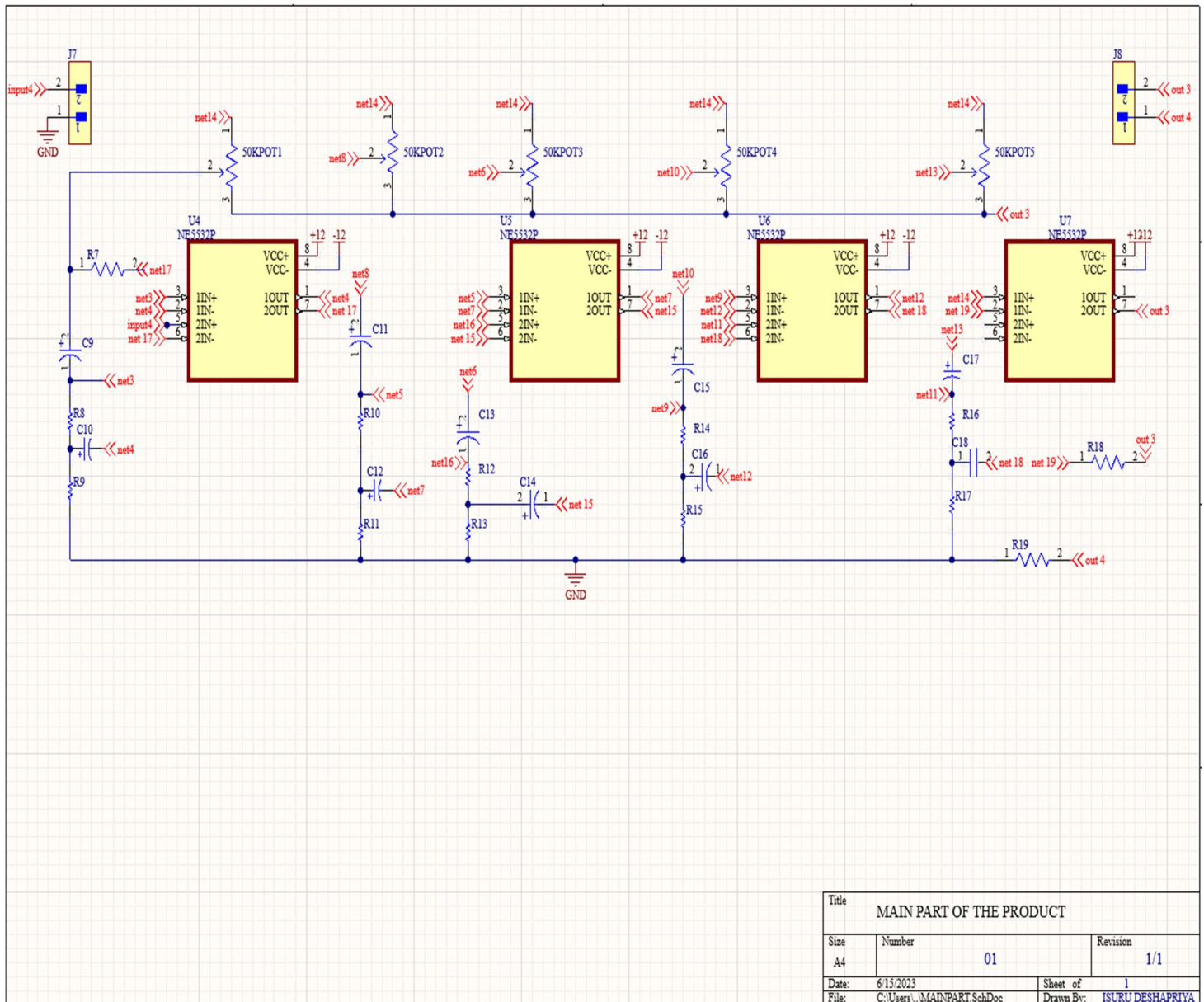
G.I. DESHAPRIYA-200118X

*This report is submitted as a partial fulfillment for the module EN2160 - Electronic Design Realization,
Department of Electronic and Telecommunication Engineering, University of Moratuwa.*

1.Solid works Design of the implemented design.



2.Schematic of the implemented design.



3. Problems identified by me considering the course content delivered by Professor Jayasinghe.

The initial concept for this product featured a basic rectangular design, lacking any intricate details or aesthetic appeal. It became evident during the course that the design was far from professional and would not be appealing to potential customers.

In the first iteration, there were no drafts or considerations for moldability. Recognizing the need for improvement, suggestions were made to revamp the design and incorporate draft analysis. This analysis aimed to ensure that each component could be effectively manufactured using molding techniques.

By implementing these changes, the product underwent a significant transformation, resulting in a more visually appealing and marketable design. The inclusion of drafts and moldability considerations helped enhance the overall quality and manufacturability of the product, setting the stage for a more successful and attractive final version.

4. Problems/ improvements identified by the group members.

During the design process, the group members provided valuable insights for improving the 5-band equalizer. They emphasized the need for a portable and user-friendly design. To enhance portability, they suggested ensuring that the equalizer is compact and lightweight, making it easy for users to carry it around.

The group members also highlighted the importance of simplicity and ease of use. They recommended minimizing the number of buttons and controls to reduce complexity and enhance the user experience. By streamlining the interface, users would be able to adjust the equalizer settings without encountering difficulties.

In terms of aesthetics, the group members suggested selecting an appealing color scheme that would enhance the visual appearance of the product. A visually pleasing design can attract users and make the equalizer more desirable.

During the evaluation of conceptual designs, the group assessed various criteria and assigned marks to each design. The highest-scoring design was Design 4, which received a total of 82 marks. This design excelled in terms of competitiveness with existing products, aesthetic view, and portability.

Features added and removed in each design iteration included considerations such as portability, user-friendliness, simplicity, personalized sound profiles, and LED visualizations. specific modifications may be required to align with the nature of the product.

By incorporating the suggestions provided by the group members, the design team can work towards creating a portable and user-friendly 5-band equalizer. The emphasis should be on simplicity, ease of use, an appealing color scheme, and a compact design that allows users to conveniently customize their sound preferences.

- For the conceptual designs.

No.	Criterion	Design 1	Design 2	Design 3	Design 4
1	Simplicity	7	10	3	7
2	Manufacturability	5	6	4	8
3	User friendly	8	7	5	8
4	Eco friendliness	5	6	5	9
5	Repairability	5	5	6	8
6	Personalized Sound Profiles	7	7	7	9
7	LED Visualizations	0	4	8	8
8	Competitiveness with existing products	5	5	5	7
9	Aesthetic view	6	6	7	8
10	Portability	10	10	10	10
	Total marks	58	66	60	82

- Features added and removed in each design.

Criterion	Design 1	Design 2	Design 3	Design 4
Added features	Portability, User friendly,	Simplicity, Portability, Personalized sound profiles	Led Visualization, Portability, Personalized sound profiles	Competitiveness with existing products, Simplicity, Portability, Led Visualization, Portability, Personalized sound profiles
Removed features	Aesthetic view	Repairability	Simplicity	Simplicity

- . For the block diagrams

No	Criterion	Block Diagram 1	Block Diagram 2	Block Diagram 3	Block Diagram 4
1	Simplicity of the Power Source	10	5	6	10
2	Repairability	8	6	6	8
3	Simplicity	8	6	5	8
4	Manufacturability	7	5	6	9
5	User friendliness	7	7	7	8
6	Bands	6	6	6	6
7	Frequency range	6	6	6	6
8	Gain	3	5	6	8
9	Filters	6	6	6	6
10	Accuracy	6	7	7	8
	Total marks	67	60	61	77

- Features added and removed in each block diagram.

Criterion	Block Diagram 1	Block Diagram 2	Block Diagram 3	Block Diagram 4
Added features	Simplicity of the Power Source	User friendliness	Simplicity of the Power Source	Simplicity of the Power Source, User friendliness, Repairability, Gain
Removed features	Simplicity	DC power supply	DC power supply	Simplicity

5. Problems/ improvements identified by users.

Users have provided valuable insights to improve the design of the 5-band equalizer. Simplifying the interface has been emphasized as a key factor in delivering a better user experience. Users desire an intuitive and straightforward interface that allows them to easily adjust the audio settings according to their preferences. By prioritizing simplicity, the equalizer can be more user-friendly and accessible to a wider range of users.

In addition to simplicity, users have expressed a strong interest in the aesthetic appearance of the equalizer. They believe that a visually appealing design can significantly enhance the overall product experience. Attention to detail in terms of the enclosure design, choice of materials, and color combinations will contribute to a more attractive and desirable product. Aesthetics play a vital role in attracting potential customers and making the equalizer stand out in a competitive market.

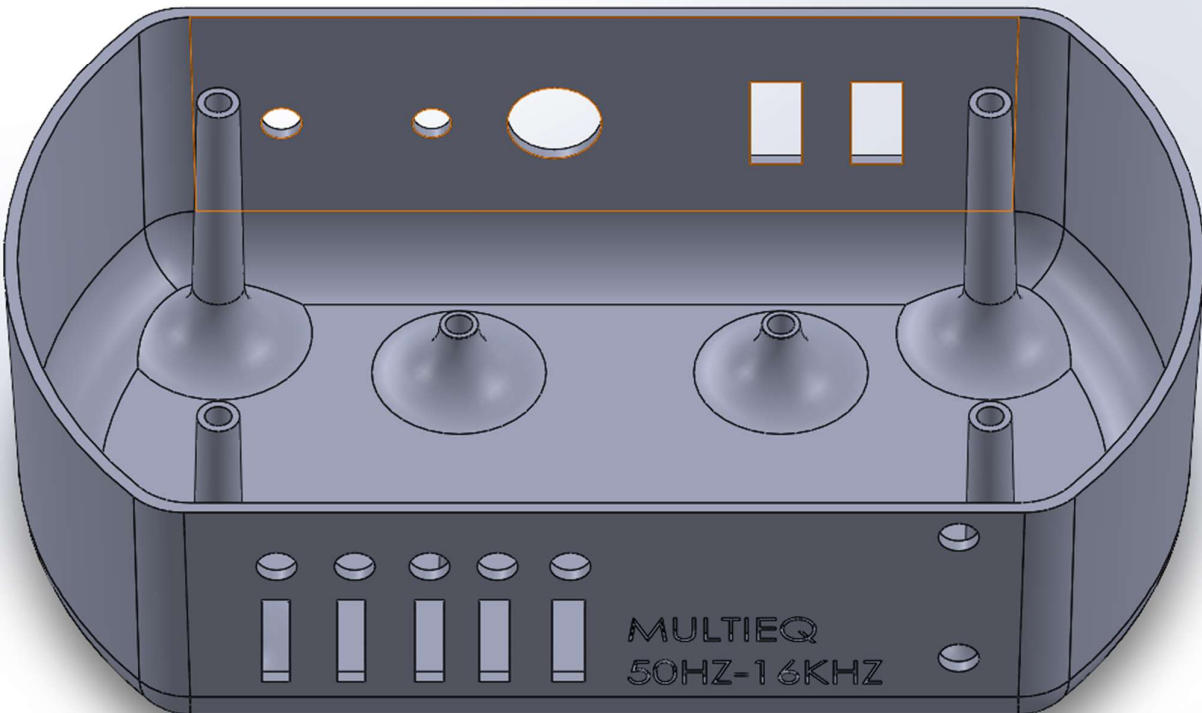
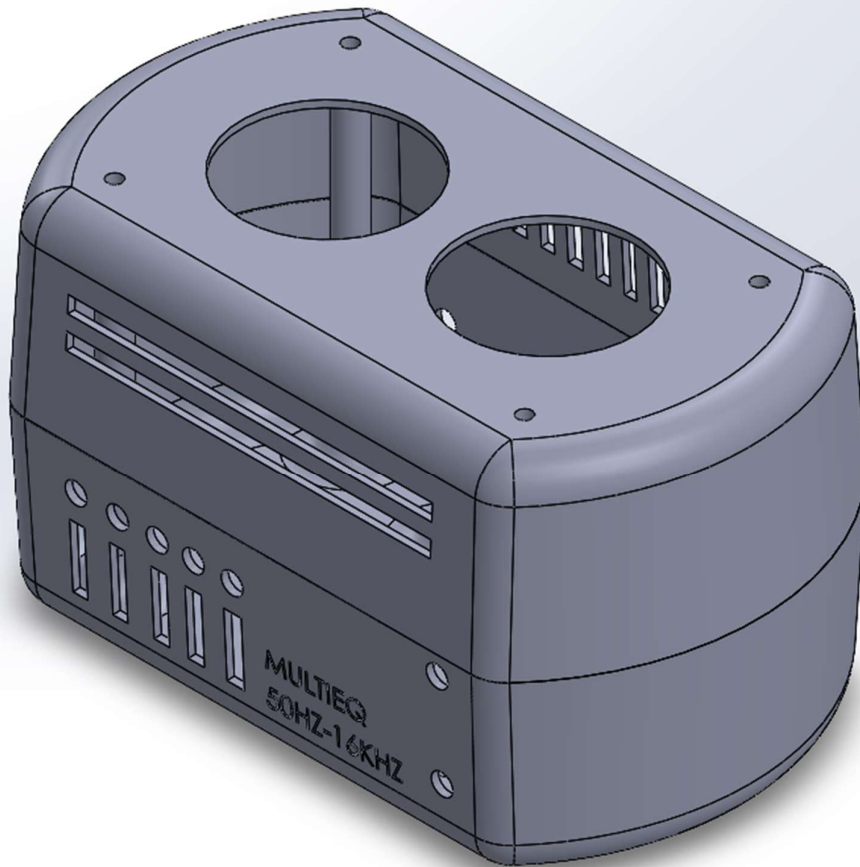
Furthermore, users have emphasized the importance of clear and comprehensive user and service manuals. They expect detailed instructions that guide them through the setup, operation, and optimization of the equalizer. A user manual will enable users to maximize the benefits of the equalizer's features, while a service manual will provide technicians with the necessary information to address any potential issues. Having well-documented manuals ensures that users have the necessary resources to fully understand and utilize the product.

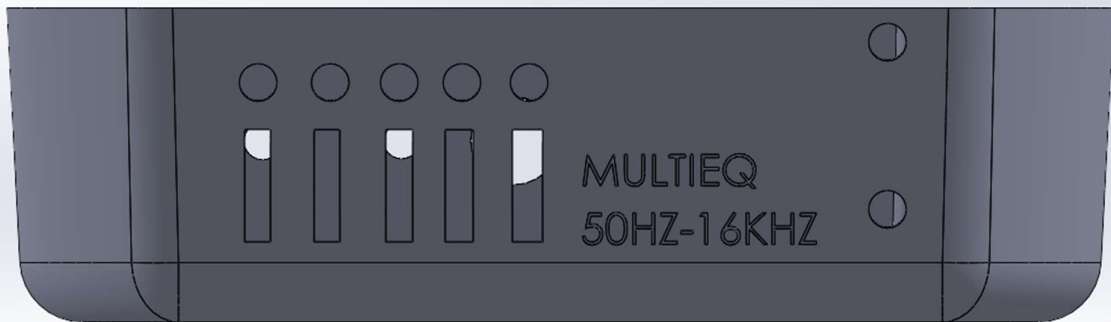
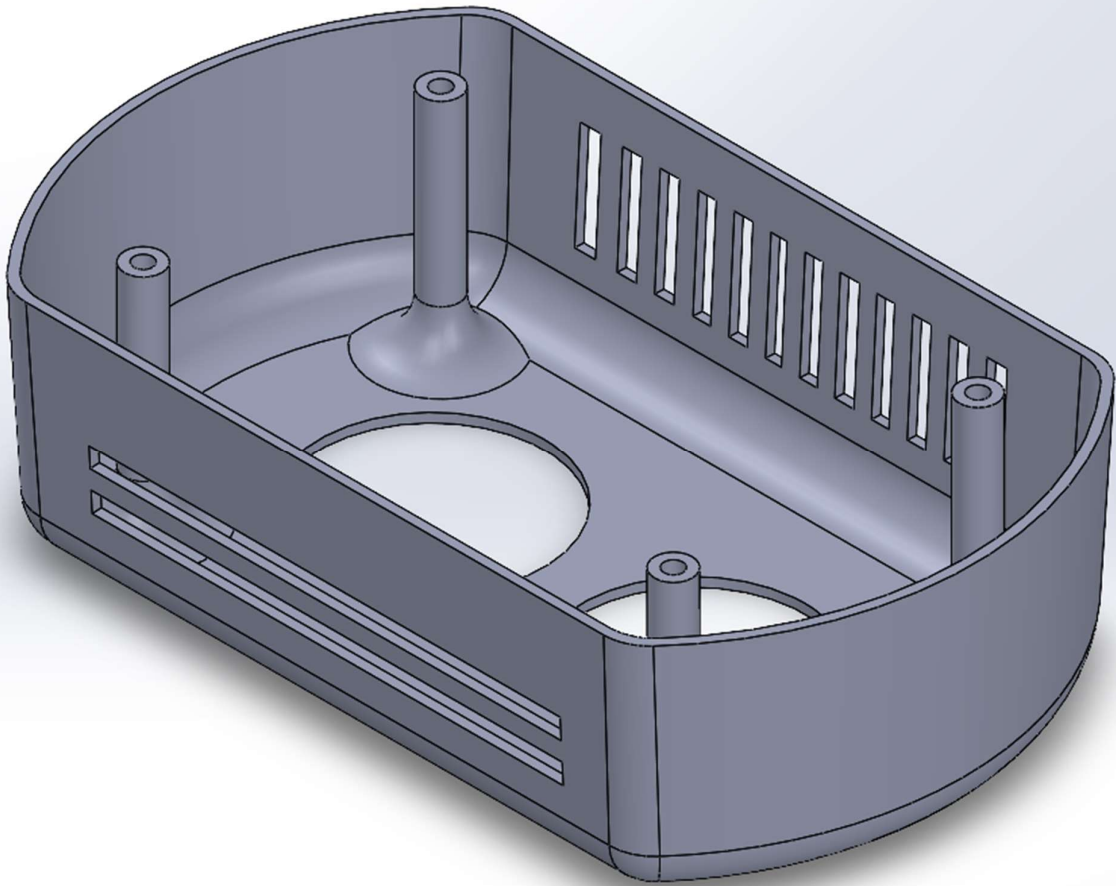
By taking these user suggestions into account, the design team can create a 5-band equalizer that delivers an exceptional user experience. A simple and intuitive interface, coupled with an aesthetically pleasing design and comprehensive manuals, will result in a marketable product that meets the expectations and needs of users.

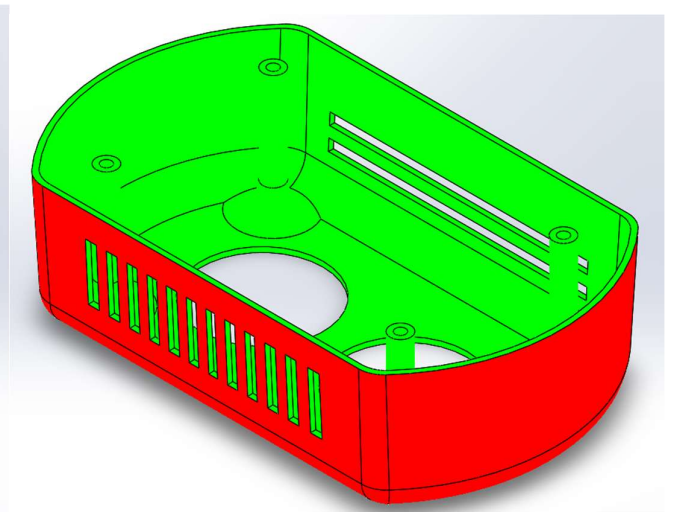
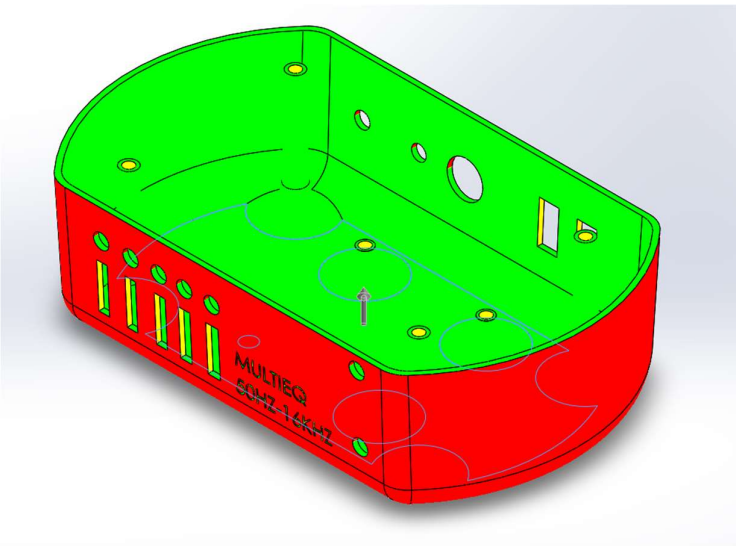
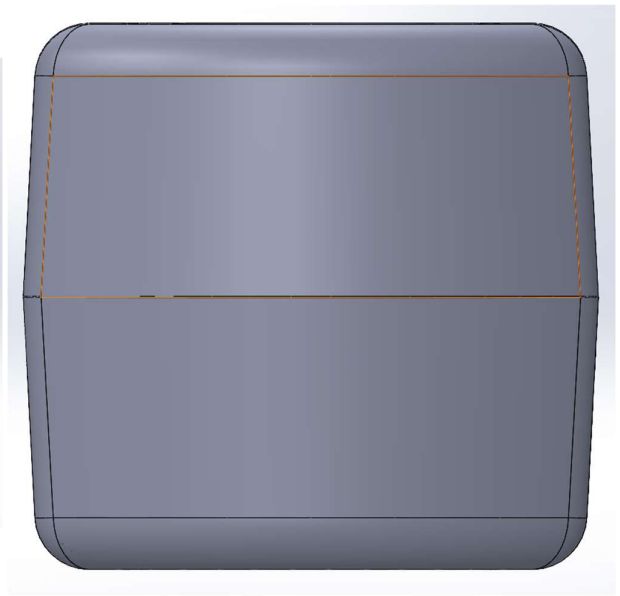
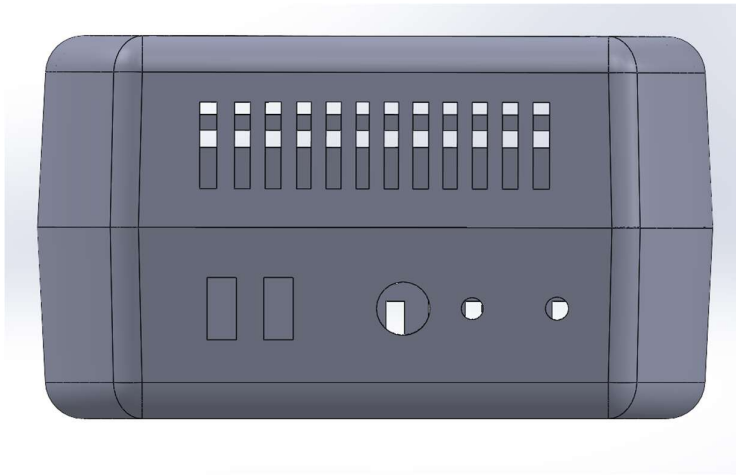
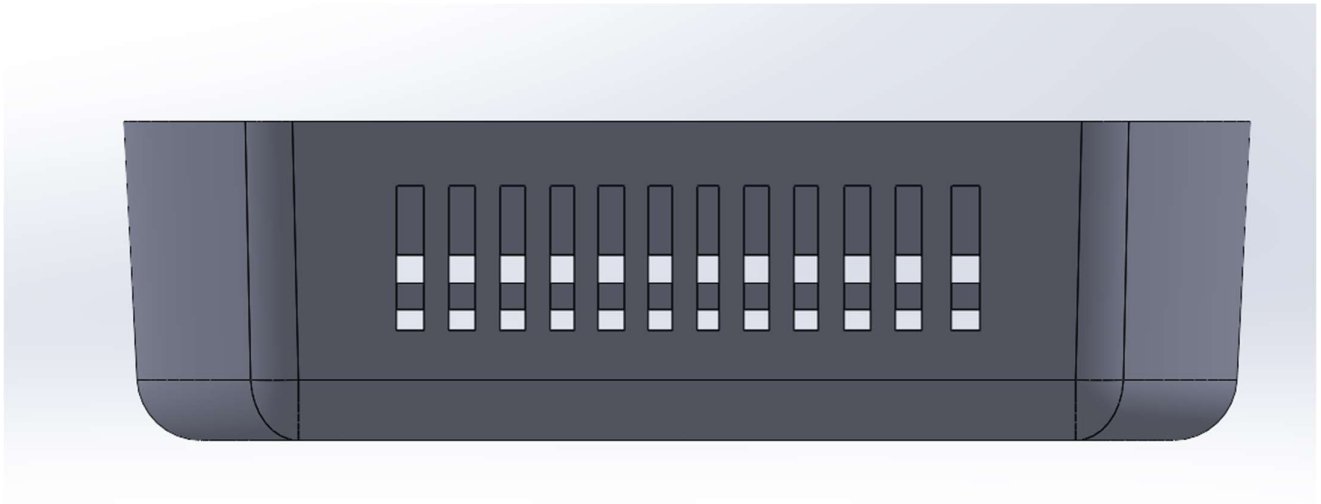
6. Improvements made to the product.

1. **Simplified Interface:** The user feedback emphasized the importance of a simple and intuitive interface. The equalizer can be redesigned to have clearly labeled controls and an easy-to-understand layout. Streamlining the user interface will make it more user-friendly and accessible, allowing users to adjust the audio settings effortlessly.
2. **Aesthetic Enhancements:** Users expressed a desire for an aesthetically pleasing product. The equalizer can undergo an enclosure redesign, incorporating visually appealing elements such as sleek lines, modern finishes, and harmonious color schemes. Attention to the overall design aesthetics will enhance the product's appeal and make it visually enticing to users.
3. **Compact and Portable Design:** To cater to the demand for a portable device, the equalizer can be reimagined with a compact and lightweight design. This will enable users to easily carry the equalizer and use it in various settings, providing convenience and flexibility.
4. **Enhanced Audio Quality:** Improving the overall sound quality is crucial for a 5-band equalizer. The product can be optimized to deliver accurate and precise audio adjustments across the frequency bands. This can involve refining the equalizer circuitry, employing high-quality components, and implementing advanced audio processing algorithms.
5. **Efficient Power Management:** Users appreciate products that are energy-efficient. Implementing power management features, such as an automatic power-saving mode or energy-conscious design, can prolong battery life and make the equalizer more eco-friendly.
6. **Comprehensive User Documentation:** To address the need for clear user guidance, detailed user manuals can be created. These manuals should provide step-by-step instructions on setting up, operating, and optimizing the equalizer. Additionally, troubleshooting guides and tips can be included to assist users in resolving any potential issues they may encounter.

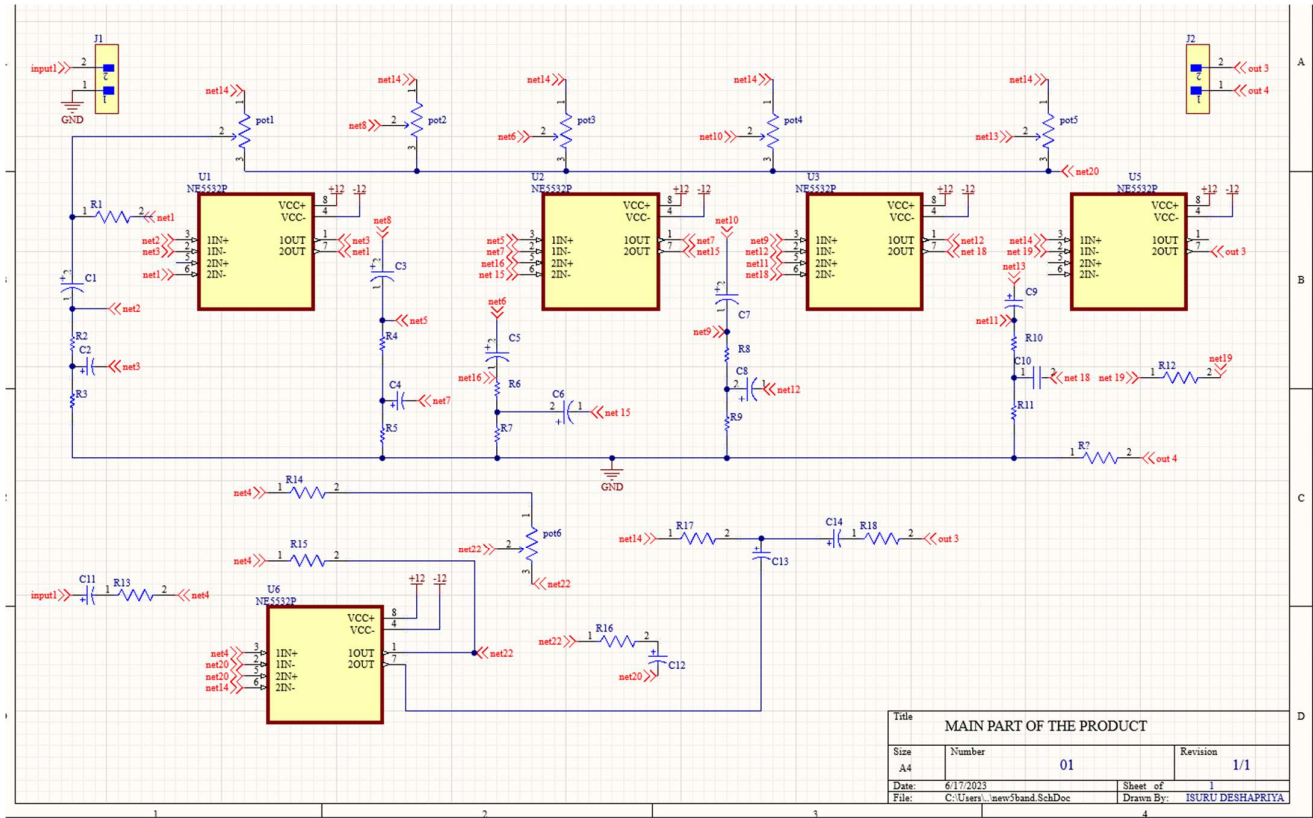
7.Solid works Design of the improved design.







8.Schematic of the improved design.



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