EE2799 – High Efficiency Kinkajou Power Supply

Team 9
Homework 3
November 17, 2003

[redacted]

[redacted]

[redacted]

EE2799
Battery Meter

	Ideal	Actual
CONTENT	50	40
WRITING	30	26
FORMAT	20	16
GRADE		**82**

TA Joschenk@wpi.edu

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1 INTRODUCTION

When working with a team it is very important to establish the goals and tasks required to complete a specific design project. It is even more important to stay on track by using proper project management, and to meet all the required goals and tasks on time in order to complete the specific design project in a timely manner. One way to stay on track and to ensure good project management is to create an organizational chart. An organizational chart describes who is responsible for each aspect of the design project. The purpose of this report is to provide the reader with an understanding of who is responsible for each aspect of our design project, to ensure the overall success of our device. When a design project becomes too complex, the Gantt chart becomes more of an appropriate tool than a simple organizational chart or a time line. The following report will include a Gantt chart, which will provide the reader with a better understanding of the milestone dates for each phase of the design project.

It is important to have structure when working with a group of individuals on a design project. The Gantt chart provides the certain structure necessary to complete all aspects of the design project in a timely manner. It would be helpful if we had as much time as needed to work on all aspects of the design, but the reality of the situation is that there are certain deadlines we must meet. To ensure that all the deadlines are met, we must create a visual aid, such as a time line or a Gantt chart, which can be used to evaluate our progress as a team and identify and contingencies that may develop. By creating a Gantt chart and identifying all major milestones that must be meet in order to complete the design project, we will try to reduce and avoid any major problems or contingencies.

2 GANTT CHART

A top-level Gantt chart of our project is provided in Appendix A. The Gantt chart represents the overall project schedule we have developed for our design project and is described in full detail. Our design group only has seven weeks to complete the entire design project and produce a working prototype of the device, along with a final report and presentation. The first four weeks of the project have been focused entirely on researching and the designing the power supply. It is extremely important to research as much as possible before implementing a working prototype. By conducting market research we were able to evaluate the current competition, develop customer requirements, product requirements, and product specifications. When designing the device we must keep all of these in mind. If the device does not meet all given customer requirements, product requirements, and product specifications, then it will not fair well in its intended market. There have not been any delays in the research and design stages of our project, and at this point we do not anticipate any delays.

The next three weeks are entirely focused on the programming, experimenting, building, troubleshooting, testing, and verification of the device. Since there are only three weeks to build and test a working prototype of the device, every day is crucial. If we were to encounter any delays as a group, they would probably arise in these stages of the design project. In order to avoid any delays, it will be important to work at a fast, but diligent pace.

The final week will be devoted to pulling the entire project together, including developing a final report and presentation. This portion of our project will pull all seven weeks worth of work together since we must be able to communicate all of our material into a short, yet detailed presentation. The entire term will have been useless if we cannot accurately and informatively report the success of our device to our colleagues.

3 TASK-SPECIFIC GANTT CHART

3.1 RESEARCH

Research is a very important task in any project and design implementation. The first two weeks of this design project has been solely designated to research. It is important to research the current competition on the market, the target audience, any existing products and schematics, and all possible design options. Once the research is completed our group then can brainstorm and eliminate the design options that would be either too expensive, too difficult to implement, or too timely to implement. Since the researching properly is the most important task in the design process, everyone in our group will be researching and gathering as much information as possible. It is important for everyone in the group to have an appropriate background in all the design concepts of our device before we start to build and implement a working prototype.

There are no major risks associated with the first task in the project design process. The only major risk that we may make is choosing a wrong design or approach to building the device. Through an extensive amount of research and communication we can avoid such risks. The major milestones and dates are listed in the task-specific Gantt chart in Appendix B. It is extremely important to stay on track with the research because the remaining tasks build on the amount of effort and time we put into this task. If we get behind in the research stage, it will delay the entire design process and we may not be able to complete a working prototype on time. There are no major contingency plans in place for the research task of the design project. It is important to work fast, but at a diligent pace when conducting the research. The research is not limited to the first to weeks, but the bulk of it will be completed then.

3.2 DESIGN AND EXPERIMENTATION

The next stage of the project design process revolves around the design and experimentation of the components that will make up our device. If the appropriate research has been done, these stages should be fairly easy to implement. Our group has designated three weeks to the design and experiment stages of our project. Even though three weeks seems like an extremely long time, much of the research and design process goes hand-and-hand with the research. It is important to continue researching design concepts and options, while designing all of the components necessary to build a working prototype. Since all of the group members are fairly new to the design process and the electrical engineering field, it is important to continually research and check for proper implementation of a component being used. During these stages we must develop all the schematics necessary to implement and eventually build a working prototype of the device. As a group we must develop a schematic that outlines how our device will work overall, and then individual schematics for each "module" in our design.

There are no major risks associated with the design and experimental stage of our project. This stage will involve a lot of research and application. The person working on each sub-task is disclosed in the Gantt chart in Appendix B, along with the major milestones and dates associated with these tasks. If any set backs were to occur we would have enough time to research alternate methods and implement a possible solution.

3.3 FINALIZING OUR DESIGN

The next two stages of the design project includes building and troubleshooting and testing and verifying the device prototype, and the final stage of the design project would be to create a report and presentation. These two stages go hand-and-hand because this is where all of the research and design preparation finally come together. We have allowed approximately two weeks for building, troubleshooting, testing, and finally verifying the working prototype of the device. This stage is extremely important and must be completed on time. There are many things that can go wrong and set the

entire design project back multiple weeks. The troubleshooting stage is perhaps one of the most time consuming, due to the fact that no matter how foolproof a design is there is bound to be some problem with the initial building and testing. This is why we have a good amount of extra time built into the prototype building process. It is important for the entire group to test their work as they progress foreword, therefore, making it easier to identify and troubleshoot potential problems.

Once there is a working prototype it is important to test and retest the prototype under all possible user conditions. Possible risks include ordering the wrong parts, implementing the design schematics wrong, or even taking too long implementing one component. It is extremely important to work at a face pace during this stage, therefore allowing for more time to test the final prototype. The final report and presentation must accurately reflect and communicate seven weeks worth of work in an easy-to-understand format.

3.4 OVERALL GANTT CHART

The person working on each sub-task, along with the major milestones and dates, is located on the Gantt chart. There are many things that can go wrong during these specific stages. It is important to work around or solve the problems as quickly and efficiently as possible. It is probably more important to document a problem as accurately as possible, therefore, as a group we can go back and evaluate the situation at a later time. By evaluating the situation at a later time we can assure that this type of problem will never happen again.

3.4.1 CONTINGENCIES

With such a short amount of time to design and implement a working prototype of our device, it is important to have a contingency plan for handling delays. If a delay were to develop, it is important to solve it as quickly as possible, and more importantly to document it. If the specific delay is not easily solvable, then we as a group must develop

a solution to bypass or work around the delay. By documenting in full detail, the delays we encounter, we can go back and evaluate our progress to make sure such a delay never happens again. The Gantt chart we have developed shows the day we plan on having each of the tasks completed with a downward arrow (representing a deadline), with extra space afterwards if we believe there might be a delay.

3.4.2 LEADERS

In any project it is important to have a leader or a person responsible for completing each specific task. Our Gantt chart shows how we have designated one person to be responsible for each task. A design project requires the help of all individuals or group members in order for it to be successful. As such we have decided that everyone will be a part of each task they are able to, but the individuals with the most expertise in certain tasks should be the leader for that task. Consequently, we have made some generalized designations for each group member.

Craig is responsible for completing most of the written items of the design project, such as the research and final report. It is important for the research to be documented properly and that the final presentation incorporates and captures the appropriate information to be presented to our colleagues. Craig was chosen for these top-level tasks because of his background in microelectronics and assembly language programming. This background provides him with a good overall understanding of the device, and the ability to be able to explain things thoroughly.

George is responsible for the design and experimental procedures associated with the analog portion of the device, as well as research into the analog components we will use. It is important to design certain schematics and block diagrams of the device before building a working prototype. In addition, it is sometimes necessary to experiment with certain procedures or components before implementing them into the final prototype. George was chosen to be responsible for the design and experimental procedures of the device because of his strong background in microelectronics.

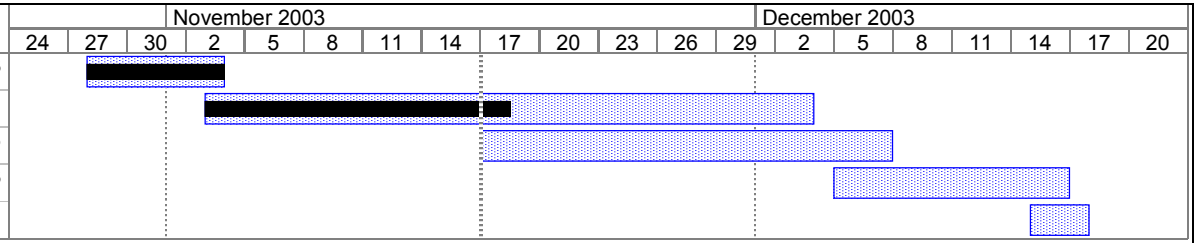
Finally, James is responsible for the building, troubleshooting, and testing of the finished device, as well as programming the PIC microcontroller, researching digital

components, and editing all homework and reports. Once there is a working prototype it is important to test and continually retest the device. James was chosen to be responsible for these stages because he has a strong background in assembly language programming and digital logic.

4 CONCLUSION

As a group, we are about all the way through the third week of our design project. At this point we have all of the research complete and are finishing up the diagrams and schematics for our design implementation. Within the next couple of days we must submit a list of parts necessary to build a working prototype of our device. At this point there are no apparent milestones in danger of being missed. Our design group is working very hard and diligently together to stay on track and complete the design prototype in a reasonable amount of time. By using good communication and meeting at least once a day, we are making all the efforts possible in order to avoid missing milestones. If any milestones were to be missed, there is probably no way in which we would be able to develop a working prototype of our device in the allocated amount of time. For this reason it is extremely important to stay on track as a group. Should we encounter any problems, it is important to document them and find a solution as quickly as possible.

ID	Task Name	Start	Finish
1	Research	Tue 10/28/03	Mon 11/3/03
2	Design	Mon 11/3/03	Wed 12/3/03
3	Building & Troubleshooting	Mon 11/17/03	Sun 12/7/03
4	Testing & Debugging	Fri 12/5/03	Tue 12/16/03
5	Reports	Mon 12/15/03	Wed 12/17/03

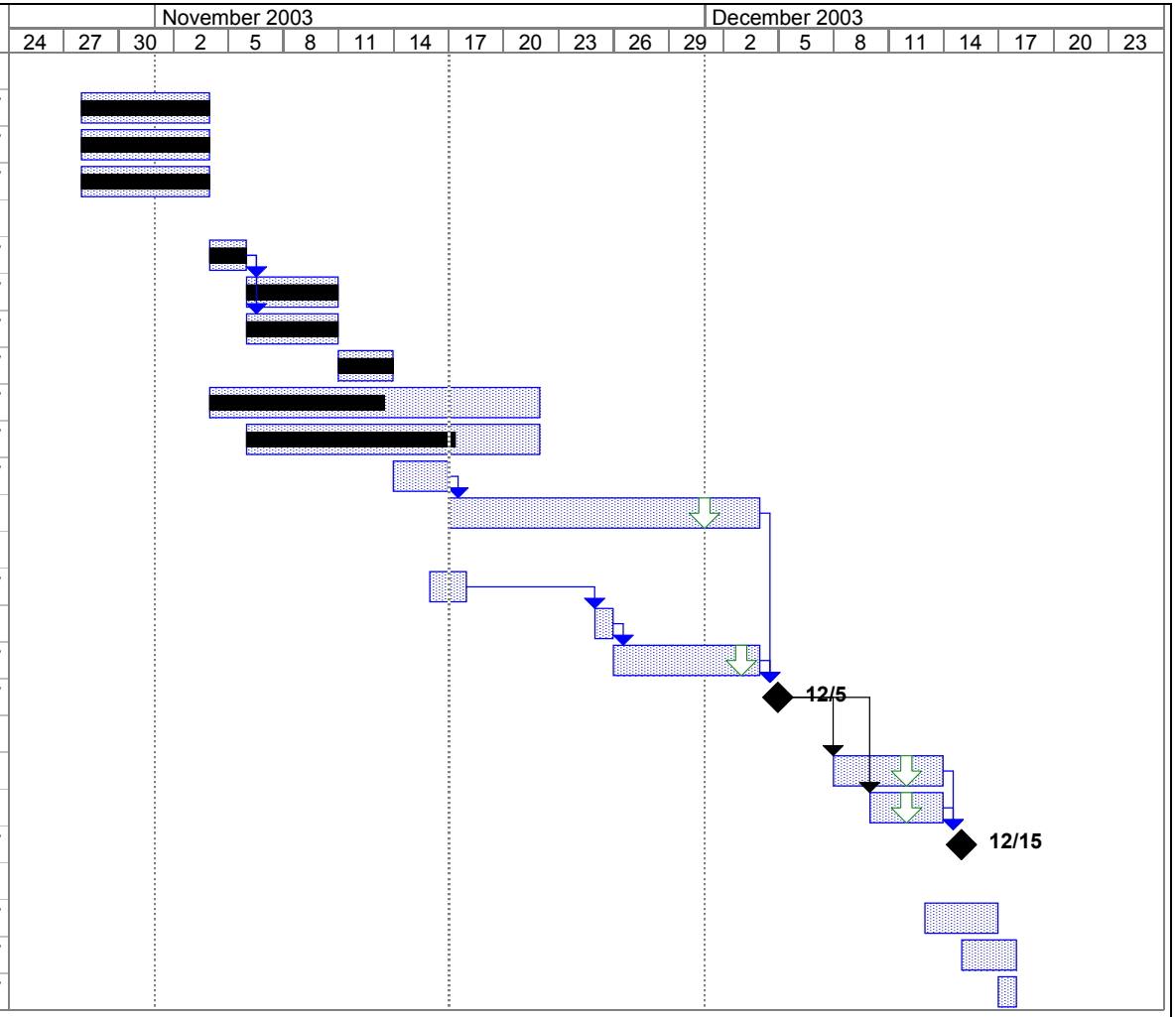


Project: toplevel
Date: Mon 11/17/03

Task
Split
Progress
Milestone
Summary
Project Summary
External Tasks
External Milestone
Deadline

APPENDIX A

ID	Task Name	Leader	Assigned
1	**Research**		
2	Market Research	Craig	Everybody
3	Customer Requirements	George	Everybody
4	Product Specs	Craig	Everybody
5	**Design**		
6	Brainstorming	James	Everybody
7	Design Ideas	James	Everybody
8	Value Analysis	George	Everybody
9	Planning & Time Management	James	Everybody
10	Digital Design	James	Everybody
11	Component Research	George	Everybody
12	Schematics	Craig	Everybody
13	PIC Programming	James	Craig
14	**Building**		
15	Parts List	George	Everybody
16	Order Parts	George	
17	Wait for Parts		Everybody
18	Construct Circuit on Breadboard	Craig	Everybody
19	**Testing & Debugging**		
20	Test & Debug PIC	James	Craig
21	Test & Debug Analog Circuit	George	Craig
22	Build Prototype	James	Everybody
23	**Reports**		
24	Write Final Paper	Craig	Everybody
25	Write Final Presentation	George	Everybody
26	Present		Everybody



Project: ee2799 42% Completed
Date: Mon 11/17/03

Task
Split
Progress
Milestone
Summary
Project Summary
External Tasks
External Milestone
Deadline

APPENDIX B