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Some slides are derived from slides presented by Leslie C. Perelman Feb. 28, 2001



Documentation and Precision



- **Documentation solidifies ideas and procedures.**
 - For you the designer and others
- **Documentation is a record of the project.**
 - For further changes
 - For debugging or troubleshooting
- **Sloppy facts and lack of precision can destroy things.**
 - Confusion over units of measure destroyed a MARS lander.
 - NASA designers used metric units: newtons per second for thrust.
 - Lockheed Martin builders programmed the thrust in pounds per second.
 - The craft was about 60 miles (96 km) off course and went into oblivion.



6.111 Lab Report



■ Elements of a 6.111 lab report

- Title
- Abstract
- Table of Contents
- List of Figures and Tables
- Overview
- Description
- Testing and Debugging
- Conclusions
- Appendices

■ Read appropriate sections in The Mayfield Handbook.

- This is accessible from the 6.111 web page.



How to Write the Report



- **Write it in stages.**
 - **Title**
 - **Overview**
 - **Figures**
 - **Tables**
 - **Description**
 - **Testing and Debugging**
 - **Conclusion**
 - **Appendices**
 - **Lists of Tables and Figures**
 - **Table of Contents**
 - **Abstract – Note that this is written last.**



Report Components



- **Title – Entice a reader into going further.**
 - Don't use “Lab 2” or “report 1224”.
- **Overview**
 - Describe briefly the device's
 - purpose. What does it do?
 - use. How does one use it?
 - subsystem organization.
 - Give a plan or road map for the report.
- **Figures – Use a template and straight edge or a graphics program.**
 - Circuit diagrams convey information about design elements, making building, testing, and debugging easier.
 - Information flows in normal reading order.
 - Label all signals.
 - Show connection points with a dot.
 - Omission of a dot implies no connection. Do not use a “hop over”.



Report Components- 2



■ Figures (continued)

- Timing diagrams show cause and effect relationships.
 - Show only relevant signals. Label them.
 - Include a clock signal in synchronous systems.
 - Abbreviate data bus contents.
 - Usually, do not show propagation delays.

■ Description

■ Describe the device in enough detail so a skilled engineer can understand, replicate, and verify your results.

- Give functional specifications.
- Describe, in detail, how the design works, i.e., how the design implements each function.
- Organize the design description to mirror the organization of the design itself.
- Document fully any non standard, clever, or hack design elements, both to help others understand and to help you remember why you did this.
- Illustrate with tables and figures. Organizing the figures and then describing them is a good way to create your description.
- Put detailed logic diagrams, VHDL code, etc., in appendices.



Report Components- 3



■ Testing and Debugging

- Describe the procedure for testing each subsystem.
- Describe what you did to get each subsystem to work, i.e., how did you go about fixing problems.
- If you couldn't get all functions to work:
 - Describe which subsystems did work and to what extent.
 - If you fixed a problem, describe how.
 - If you didn't fix it, describe the problem and what your next testing and debugging steps would have been.

■ Conclusion

- Summarize the most important or innovative design features.
- Describe (briefly) the test results.
- Discuss problems with your initial design and the solutions you implemented.
- Suggest improvements to the design (and specification).

■ Abstract

- In one paragraph, describe your project and the results.
- Do not say what is contained in each section of the report,



When You Are All Done



Check the spelling.

- **Read your report over again.**
 - Hand written corrections are ok (if legible).