CI-M
Don Troxel

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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).**

