**Logo%20Main%20200**

**Boston University**

**Electrical & Computer Engineering**

**EC464 Capstone Senior Design Project**

User's Manual

Your Title

Submitted to

Your Customer

Address 1

Address 2

Phone

e-mail

by

Your Team Logo….

Team #

Team Name

Team Members

Name 1 [email1@bu.edu](mailto:email1@bu.edu)

Name 2 [email2@bu.edu](mailto:email1@bu.edu)

Name 3 [email3@bu.edu](mailto:email1@bu.edu)

Name 4 [email4@bu.edu](mailto:email1@bu.edu)

Name 5 [email5@bu.edu](mailto:email5@bu.edu)

:

Submitted: (add Date)

#### Your Title

#### Table of Contents

Executive Summary ii

1 Introduction 1

2 System Overview and Installation 2

2.1 Overview block diagram 2

2.2 User interface. 2

2.3 Physical description. 2

2.4 Installation, setup, and support 2

3 Operation of the Project 3

3.1 Operating Mode 1: Normal Operation 3

3.2 Operating Mode 2: Abnormal Operations 3

3.3 Safety Issues 3

4 Technical Background 4

5 Relevant Engineering Standards 5

6 Cost Breakdown 6

7 Appendices 7

7.1 Appendix A - Specifications 7

7.2 Appendix B – Team Information 7

(Right click on Table of Contents to update fields and page numbers automatically)

# Executive Summary

This can be the executive summary sent for ECE Day publicity.

# Introduction

*[Discuss the purpose of the project. State how your approach has solved your user's problem/needs.]*

Include explanatory background material in the introduction. For example, describe here the context of the project, special technology that was involved, or customer circumstances that shaped the design. You need not produce a tutorial, but should provide information that would help most readers to understand the rest of the manual.

Describe highlights or special features of your project, from the User's perspective. Be specific and quantitative. Don't say 'The DIVA system can store a trip data log.' Instead, explain 'The DIVA’s 512MB compact flash memory can store up to 3 hours of velocity samples for eventual download. Like a flight recorder, the DIVA system will wrap its data beyond three hours, erasing the older data.'

Mention any significant safety, security, or other problems that might arise.

Finish with a transition paragraph describing the remaining sections of the document.



Left-handed keyboard

Touch Screen

Acousto-mouse

Figure 1.1 Here is how every figure should be developed.. Every picture and table should be numbered. Every picture should have a caption that explains the figure and allows the reader to skim the pictures. For ease of storage and email, please compress raw .bmp images, and reduce color palette if possible. Edit figures for legibility and relevance. Avoid ‘eye-candy’ figures and photos that fill space, but add little information for the user.

**1 page**

# System Overview and Installation

*[This section should tell the user how to install and set up the system. Some descriptive material is included here to make the system’s structure more apparent.]*

## Overview block diagram

Unless self-explanatory, describe block functions and indicate data or control line contents. Use Visio, Word, or other appropriate electronic drawing tools.

## User interface.

If appropriate, include screen shots of specialized set-up GUI(s), and subsequent important screen set-up interactions.

## Physical description.

Provide a sketch of your project hardware (accurate and to scale, in 3-D or as a series of planar views), or photograph.

## Installation, setup, and support

Describe the setup process and services needed. For software, describe installation, unzipping, wizards or install shields, and any preferences that must be set. If defaults are present, document them. If hardware, describe initial assembly and power-up.

**2-3 pages**

# Operation of the Project

*[This section describes how to use the project. Anticipate what the User needs to know and do Set-up and configuration were discussed in Section 2 already.]*

## Operating Mode 1: Normal Operation

Organize subsections related to each mode of operation. Use each to describe what the user does and how the project will respond. Use a bulleted list when multi-step operations are required:

1. Explain the operating mode in detail,
2. Indicate the user interface or options in this mode,
3. Describe the normal consequences of user actions,
4. Tell the user what abnormal results might occur from this mode,
5. Include instructions to exit this operating mode, including how to stop all operations.

Use figures, schematics, tables to illustrate options and responses. Be concrete and accurate. Avoid broad but uninformative claims like 'We have included all necessary adjustments to customize your Wonder Widget System.' Instead, be factual and say 'The Wonder Widget System can be adjusted for ambient temperature, customer weight, and frequency.' Imagine that the User is consulting your manual a year from now, and has no access to your team. What do they really have to know? If appropriate, include screen shots of GUI(s), and subsequent important screen interactions.

If the project is not completely operational, indicate how it should be working when done. Mark the discussion explicitly 'This feature not yet implemented'. A later revision of the User's Manual would correct these sections.

## Operating Mode 2: Abnormal Operations

Describe any anticipated abnormal states (e.g. out-of-range data) and recovery. Have you explicitly built into the project operating modes like 'diagnostic' or 'self-test'? Describe how the project can enter and recover from such states. Is user intervention needed? Where can the users find help when a problem arises?

## Safety Issues

Are there safety issues inherent in this project? Safety concerns may be present in both normal and abnormal operation. Consider operator and bystander safety first, but also discuss, if appropriate, property safety (fire, explosion, hazardous materials, etc.) and data security. If your project is part of a larger system, discuss the implications of failures in your system on the health of the parent system.

**As long as needed**

# Technical Background

*[The User's Manual will be the primary reference for your project when others want to understand your creative work and how to operate it. While the Resource CD and individual logbooks are also helpful, this User’s Manual will be consulted first by users and by future teams considering your project.]*

Include a brief discussion of the technical approach, even if your primary users are non-technical. Keep this discussion focussed on the technical principles of your implementation. You can include a discussion of the underlying physics or other laws that govern how your project operates.

Do not make this a project history! Do not include any false starts and failed designs. Only describe your final, as-built project.

**2-3 pages**

# Relevant Engineering Standards

Include a brief discussion of the most relevant engineering standards to your project. These can consist of standards related to electrical design and construction (eg. National Electrical Safety Code), software design, coding standards, communication and internet protocols, operational environment, governmental requirements, etc.

**1-2 pages**

# Cost Breakdown

Consider your EC464 prototype to be the *alpha* version. The next unit made, according to your engineering specifications and design, would be the *beta* version. Later a manufacturing version or release-version would be made.

What would be the cost of your ***beta*** unit when it is created? This should assume market costs, i.e. no donations, no picking through the customer’s parts closet.

You can edit the table below to describe the project expenses for the beta version. It is not necessary to provide every detail about parts, labor, and services in your cost breakdown. Decide upon a level of aggregation of investment and group costs accordingly.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Project Costs for Production of Beta Version (Next Unit after Prototype) | | | | |
| Item | Quantity | Description | Unit Cost | Extended Cost |
| 1 |  |  |  |  |
| 2 |  |  |  |  |
| 3 |  |  |  |  |
| 4 |  |  |  |  |
| 5 |  |  |  |  |
| Beta Version-Total Cost | | | |  |

Include a **budget narrative** paragraph or two if there are things you wish to clarify about the cost breakdown.

**1 page, including narrative**

# Appendices

*[Appendices include supplemental information for the User that would distract if included in the regular sections.*

## Appendix A - Specifications

Give these as a list or table. These should quantify the performance that the project provides, as it is built. Do not simply repeat functional requirements here. These are the final delivered specifications. These will usually map closely to the User’s requirements. **1 page, table format**

## Appendix B – Team Information

Include a brief team information sheet. You can cut and paste this directly from your proposal. If you know where you will be working or going to school, list this information here. **1 page for entire team**

***Spell Check Everything!!!! Spell checking does not correct grammatical errors, conceptual errors, or malapropisms (The manual was full of Eros.) You must read the document carefully even when it has been spell-checked.***