Technical Manual Writing Guide

The point of any technical documentation is to convey information about a design such that others can understand its *operation* and its internal *function*. To achieve this desired transmission of information, a manufacturer of a product will publish two levels of documentation, one aimed at a non-technical user of the product who will be using this product and the other for the technical support person who will have to repair or integrate it into an existing application.

Fundamentally, the technical manual that will be submitted at the end of the semester must encompass the above mentioned aspects of document production. *A significant portion of the manual has already been written based upon the content in the module reports that were submitted on a quarterly basis.* The only further requirement is the addition of some extra sections and a more formal presentation of the supplied material.

As was mentioned earlier, documentation of a product involves the production of two levels of documentation. As far as the Project course documentation is concerned, the User's Guide and Technical Guide will be combined to form one manual.

As such, the content of the manual should consist of the following components:

Table of Contents
This part is self-explanatory, the various sections of the manual should be cross referenced to a specific page.

User Guide
This section will provide the necessary information by which any user, with or without a technical background can set up and operate the product for its intended scope of operation. The contents of this portion of the manual can consist of the following elements:

1.0	Introduction	a brief description of the product and the genesis of its inception
2.0	Setup and Operation	essentially, how to be able to configure and operate the product for it intended purpose
3.0	Specification(s)	a tabulated presentation of operating parameters, such as, input power, temperature and other such elements important to the proper use of the product.

An ideal reference for the layout of the above sections would be the user guide supplied with most consumer oriented products such as a VCR, Stereo, or TV system.

Technical Guide
This section will describe the circuit level operation of the product to technically oriented individuals. Essential components of this section are as follows:

4.0	Circuit Description	A general block diagram of all the modules with a reference to specific schematic elements be present with a general statement of operation for each block in system. Subsequently, a more detailed theory of operation for each block is provided using either smaller block diagrams or elements of the circuit schematic corresponding to this block, along with any applicable mathematical analysis. As mentioned, the majority of work for this section should have already been supplied as part of your quarterly module reports and all that it requires is a coherent integration of said information
5.0	Software Description	A block diagram of the various software components (subroutines/functions) is presented and their concept of operation explained with the use of flowcharts or pseudo-code. Again, this has to some degree been already documented in your module reports and simply requires a coherent integration of the material.
6.0	Calibration	This section will describe the procedure to properly adjust any analog circuit elements contained in the design which would be crucial to its proper operation. This can be achieved through the use of verbal description, diagrams, and/or parametric values.

7.0	Troubleshooting	The troubleshooting section will present an approach by which faulty components and/or replaceable modules can be determined in an inoperative product. This can be achieved through the use of a question and answer form of fault isolation (i.e. check the voltage at a certain node, if its a certain value measure this, and if it is not, replace that) or a flowchart approach of statement and decision sequence. Inherently, this section will draw a lot upon the sound understanding of the circuit operation of the product. Illustrations of expected signal levels and voltages values are typically provided.

Appendix

A.	Illustrations	This section includes block diagrams, schematics, PCB layouts, chassis drawings and other required illustrations to build the system.
B.	Software Listings	Commented Program and PLD code developed for the project.
C.	Parts list	This section gives a listing of parts required, reference designator and value. Identify only electronic parts of the project.
D.	Cost Analysis.	Provide a detailed costing of the expenses incurred while developing and constructing the project.

All sections and sub-section of the technical manual should be numbered as illustrated in this guide.

Finally, on the day of the project fair a printed and bound version of the manual should be on display for examination by visitors and the Evaluation Committee, and by the end of the fair submitted to the instructor for marking. Also, a PDF version of the manual along with the source code files (.ASM, .PLD, etc) be provided to the instructor on computer media (diskette, CD, DVD) or via email.