

ECE 451

Automated Microwave Measurements Laboratory

Laboratory Notebook

The student should strive to develop a logical procedure and an orderly routine and lay-out of equipment in the laboratory. This will contribute toward satisfactory results and will facilitate the diagnosis of any faults which may occur in the apparatus. The experiments should always be written up in a laboratory notebook in full. This book should be a "working diary" such as any practicing engineer is expected to keep. This side of experimental work is often neglected and yet an engineer is usually judged on his ability to record and present his work clearly and concisely.

In performing experimental work and in recording the results, the following items should be kept in mind:

- 1) State the purpose of the experiment. This gives you and anyone reading your notebook a clear understanding of what you are trying to accomplish.
- 2) Draw a block diagram of the equipment used. Make a list of the equipment, identifying the equipment by name, model, and serial number (in some cases the U of I inventory number will do), so that at a later date the experiment can be duplicated using the original equipment, by you or someone else.
- 3) State the procedure you intend to follow in making the measurement(s). This is a plan of action where you list the information given and the information to be found.
- 4) Record the required data in a neat table or tables, making sure that the units of measurement are not only known, and uniform, but are always quoted. Always check the data as it is being taken to determine if it seems reasonable.
- 5) In summarizing the data, wherever possible, always draw a graph of useful size, labeling both axes clearly. It is not necessary that a curve drawn passes through every point. A smooth curve should be drawn because experimental error causes the measured points to settle around the curve. A graph will bring out trends and relationships that are difficult to detect in a table of numbers.
- 6) Make comments on the results. This might include a consideration of the accuracy or uncertainty of the measurements, problems encountered, and ways to improve the measurements, both in technique and accuracy.
- 7) You should furnish a brief conclusion where you summarize the whole experiment, including what you have learned from the experiment.

The first page or two of a notebook should include a table of contents, giving the title, lab number, date, and page number. Each page of a lab notebook should be numbered. For example, page 2 of experiment 5 should have a page number 5-2.

The heading of each lab report should include the lab report title, the lab report number, the date, your name, and your lab partner's name.

Any important calculations should be included as a part of a lab report.

The entries in a lab report should be in chronological order. Leave no blank pages. Any notation out of chronological order should be so indicated and dated. If you make a mistake, cross it out, do not erase superceded entries. Leave them legible. Never tear out pages.

You should always sign and date a lab report after the conclusion.

A good laboratory notebook does not have to be a work of art, but should be neat and easily read.

The following two articles: the first by Albert H. Miller, the second by George E. Roush, give good points about laboratory report writing.