Okanagan University College Memorandum

To: Don Klepp, Instructor, Eng 142

From: Tim Staal, Jordan Clarke, Justin McKellar, and Chris Down, Mechanical Engineering Technology 1 students

Date: 7 February 2002

Re: **Formal Report Proposal**

As you know, our first choice of a report topic was not feasible. So, through two of our instructors, our group has learned that Kalamalka Industries has a problem measuring the wire feed rates of the welders. As a basis for our formal report, we propose to investigate this problem and find a solution (or possibly more than one) for the shop foreman at Kalamalka.

BACKGROUND

As a result of inquiries to Henry Murphy and Brian Lundy, we set up a meeting on January 24, 2002 with Dallas Koop, the shop foreman at Kalamalka Industries. During the meeting, Dallas explained a problem he has with the wire feed welders. The wire feed rates on the welders are adjustable with a knob that both adjusts the feed rate and indicates its value in inches per minute. However, Dallas explained that the indicators are very inaccurate and can vary widely from welder to welder even when the models and settings are identical.

The foreman then told us why this problem causes difficulties for him. Kalamalka has recently hired new welding personnel who are required to pass practical welding tests (given by Welding Board of Canada inspectors) to become certified. During these tests, Dallas must write down the wire feed rate on the exam sheet. Presently, he uses a tape measure and his wristwatch to measure how fast the wire is coming out of the welding gun. The inspectors are not impressed!

Next, Dallas explained his requirements. He wants an inexpensive, small, portable, more accurate meter that can simply be held or clipped on the wire and that gives a readout of the wire feed rate in inches per minute. Dallas indicated that he knew of a commercial product, but it is much too expensive (~$3000).

PROJECT DESCRIPTION

Our preliminary investigation of Internet sources has confirmed Dallas's indication that the few commercially available products are too expensive. Although we will continue to search and our findings will become a part of our report, our new primary focus is to manufacture a wire feed

rate meter of our own design. This new version of our project involves the following steps:

1.) Determining the design criteria. Dallas has suggested three basic criteria:
- 3% accuracy
- range of 50-750 inches per minute
- durability, ease of use, low cost.

2.) Designing a meter. We are well into this step – we are basing our design on a modified inexpensive, digital bicycle speedometer.

3.) Building the meter. We have most of the components and are doing some basic assembly.

4.) Calibration and accuracy testing. This step will involve creating a valid testing procedure with which to test our meter. Both Dallas Koop and Professor Murphy have agreed to examine the validity of our test procedure, and to suggest improvements, if necessary.

5.) Determine if our design criteria have been met.

6.) If time permits, compare our meter to commercially available products, on the basis of performance, cost, durability, and portability.

7.) Write a formal report on our project. This step will be an ongoing part of the process as we record each step as it is accomplished.

FEASIBLITY

Rick Gostlin, an electrical engineering technology graduate has been a great help with the electrical parts of our meter. With his guidance, an early prototype has already been completed. This prototype confirms that our design concept should work. Our group has a wealth of fabricating experience and we have access to the machine shop. Therefore, fabricating the mechanical parts of the meter should not be a problem. The project appears eminently feasible.

AUTHORIZATION

As you can probably tell from the work we've already completed, we're very enthusiastic about this project, and we'd like to continue. May we have your approval to use the design project as the basis for our English 142 course research report? We realize that we will not be able to do much secondary research, because we're developing something new. However, we believe that our primary research will more than compensate for the lack of traditional secondary research. Also, our proposed report will parallel the kinds of practical reports we'll write in our careers, after we graduate.

Attachments: Work Schedule
Planning Outline
Tentative Bibliography
Template Circuit Board

TENTATIVE BIBLIOGRAPHY

Bike brain (n.d.) Retrieved January 30, 2002, from http://www.bikebrain.com/

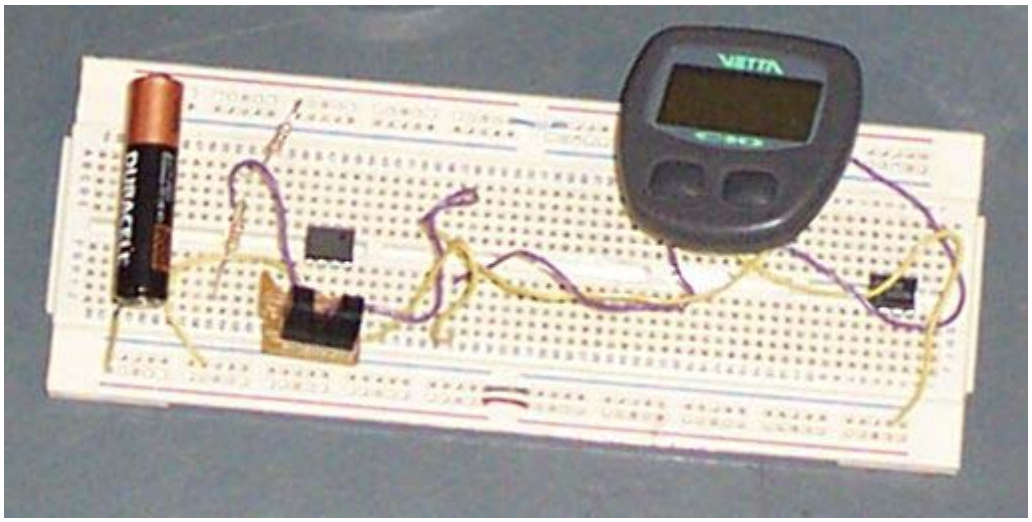
Etune (n.d.) Retrieved January 30, 2002, from http://www.etune.com/index2.htm

Nelson, C. A. (1986). *Millwrights and mechanics guide*. New York: Macmillan Publishing Company.

Planet bike (n.d.) Retrieved January 30, 2002, from http://www.planetbike.com/computers.html

Shimano. (n.d.) Retrieved January 30, 2002, from http://www.shimano.com

Vetta (n.d.) Retrieved January 30, 2002, from http://www.vetta.com/products_computersv100.html



Draft Figure 1: Template Circuit Board

PROPOSED WORK SCHEDULE

Task	Completion Date	Comments
Determine the design criteria	February 4	Task completed
Design the meter	February 11	Initial design is complete; about 10 hrs. work remains to modify design
Build the meter	March 1	Must find suitable components and then assemble; will be completed during Reading Week
Test the meter for accuracy and potential for calibration	March 8	Will use test lab, March 5 and 6
Test the meter at Kalamalka Industries	To be arranged	Arrange with Dallas Koop
Assess whether design criteria have been met	March 4	Use data collected from Mar 6/7 tests
Write progress report and working outline	March 11 (submit March 13)	Use March 6 lab; also, work after class on March 7 and March 8
Write analytical report	April 10 (submit April 13)	Work in March 13 and 20 labs Work in April 3 lab Share the drafting; collaborate to edit and finish the report

PLANNING OUTLINE

Define the problem and suggest the solution

Aspects of the meter design

Assessment Criteria

Background: design process/components/modifications/schematics/manufacture process

Testing And Assessment:

- test equipment/how made
- test standards
- results
- on-site tests of durability and resistance to dust, etc.
- explanation of results and result anomalies
- assessment re: cost, durability, portability, accuracy, reliability

Conclusions And Recommendations