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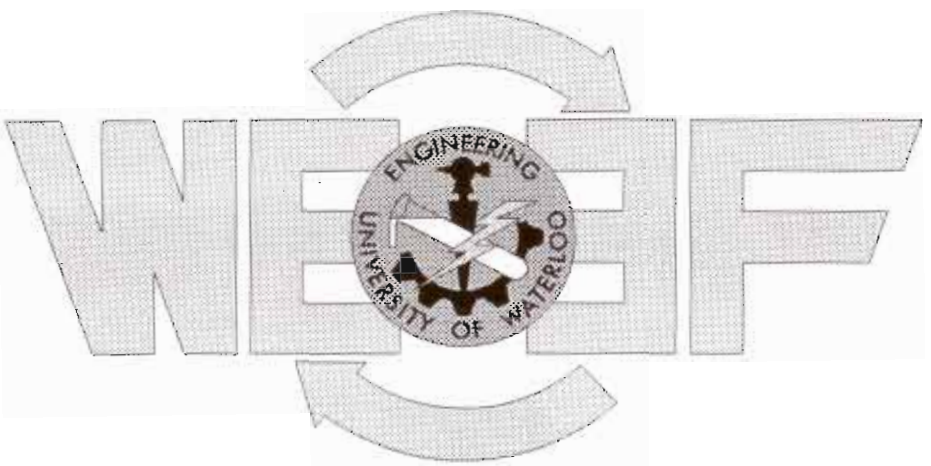
Waterloo Engineering Endowment Fund



Summer 1997 Proposals

WEEF Proposal Presentation Schedule - Summer '97

Discipline	Presented by:	Proposal Title	Cost
Civil	Jon F. Sykes	EQUIPMENT FOR CLIMATE STATION	$4,600
Civil	Michael Herz	WATSTAR EQUIPMENT UPGRADES FOR CIVIL STUDENTS	$12,706
Civil	Susan A. Andrews	AIR SAMPLING EQUIPMENT FOR UNDERGRADUATE STUDENTS	$6,272
Civil	Tarek Hegazy	DEVELOPING A COMPUTERIZED TECHNICAL-WRITING ASSISTANT	$18,000
Environmental	Prit/Sangesh/Charles	FUNDING OF COMPUTER WORKSTATIONS	$9,600
Chemical	Lillian Lao	UPGRADING OF ANALYTICAL FACILITIES FOR ChE 032 LAB	$4,325
E&CE	William Ott	DIGITAL STORAGE OSCILLOSCOPES	$5,000
E&CE	Paul Hayes	FUNCTION GENERATORS	$7,379
E&CE	Roger Sanderson	UNIX WORKSTATION	$46,545
Mechanical	M. Kaptein	AUTOCAD STATIONS FOR DESIGN STUDIO	$15,892
Mechanical	M. Kaptein	LABORATORY UPGRADE - ME 262	$6,987
Mechanical	M Kaptein	PRESSURE TRANSDUCERS ME 353	$2,900
Mechanical	M. Kaptein	PUMP PERFORMANCE DEMONSTRATION LABORATORIES	$5,600
Geological	G.Cascante/K. Bowman	COMPUTER CONTROLLED DATA ACQUISITION SYSTEM	$7,000
Geological	Dan Elliot	PROPOSAL FOR 2 WORKSTATIONS FOR THE GEO STUDY ROOM	$2,500

INTERMISSION

Systems Design	Mike Brewster/D. Walsh	HARD DISKS FOR THE SYSTEMS DESIGN WATSTAR SERVER	$2,495
Systems Design	D Stashuk / K. Krauel	UNDERGRADUATE ANALOG CIRCUITS LABORATORY UPGRADE	$3,299
Systems Design	John McPhee	PURCHASE OF WORKING MODEL SOFTWARE (US$1575)	$2,205
Machine Shop	Clarence Wallace	NOTCHER STUDENT SHOP	$1,779
Eng. Computing	Beth Jewkes/M. MacLeod	REPLACEMENT PRINTERS FOR COMPUTING LABS	$13,760
Concrete Toboggan	L. Russell / S. Howard	THE 1998 GREAT NORTHERN CONCRETE TOBOGGAN TEAM	$7,500
Chem Eng Society	Prit Kotecha / Alex Jay	FUNDING FOR CONFERENCE COSTS - CHEM ENG SOCIETY	$4,170
CASI Free Flight	Gregory Thompson	UW CASI FREE FLIGHT GLIDER TEAM 1998	$1,000
Midnight Sun	Steve Burany	ADVANCED MOTOR CONTROLLER FOR MIDNIGHT SUN	$3,000
SAE Aero '98	Leon Barbulovic-Nad	SAE AERO 98 WEEF PROPOSAL (US$602)	$842
Formula SAE	Douglas Zister	FORMULA SAE WEEF PROPOSAL	$4,777
Concrete Toboggan	Mark Popik	GNCTR HOSTING COMMITTEE	$3,000
Ethanol Challenge	Rishi Gautam	ETHANOL CHALLENGE	$2,539
Mini Baja	Donovan Watts	MINI BAJA '98	$2,320
		TOTAL AMOUNT:	**$207,993**

WEEF Proposal Breakdown - Summer '97

Discipline	Proposal Title	Cost	
CIVIL	EQUIPMENT FOR CLIMATE STATION	$4,600	
	WATSTAR EQUIPMENT UPGRADES FOR CIVIL STUDENTS	$12,706	
	AIR SAMPLING EQUIPMENT FOR UNDERGRADUATE STUDENTS	$6,272	
	DEVELOPING A COMPUTERIZED TECHNICAL-WRITING ASSISTANT	$18,000	**$41,578**
ENVIRONMENTAL	FUNDING OF COMPUTER WORKSTATIONS	$9,600	**$9,600**
CHEMICAL	UPGRADING OF ANALYTICAL FACILITIES FOR ChE 032 LAB	$4,325	**$4,325**
E&CE	DIGITAL STORAGE OSCILLOSCOPES	$5,000	
	FUNCTION GENERATORS	$7,379	
	UNIX WORKSTATION	$46,545	**$58,924**
MECHANICAL	AUTOCAD STATIONS FOR DESIGN STUDIO	$15,892	
	LABORATORY UPGRADE - ME 262	$6,987	
	PRESSURE TRANSDUCERS ME 353	$2,900	
	PUMP PERFORMANCE DEMONSTRATION LABORATORIES	$5,600	**$31,379**
GEOLOGICAL	COMPUTER CONTROLLED DATA ACQUISITION SYSTEM	$7,000	
	PROPOSAL FOR 2 WORKSTATIONS FOR THE GEO STUDY ROOM	$2,500	**$9,500**
SYSTEMS	HARD DISKS FOR THE SYSTEMS DESIGN WATSTAR SERVER	$2,495	
	UNDERGRADUATE ANALOG CIRCUITS LABORATORY UPGRADE	$3,299	
	PURCHASE OF WORKING MODEL SOFTWARE (US$1575)	$2,205	**$7,999**
MACHINE SHOP	NOTCHER STUDENT SHOP	$1,779	**$1,779**
ENG COMPUTING	REPLACEMENT PRINTERS FOR COMPUTING LABS	$13,760	**$13,760**
STUDENT GROUPS	THE 1998 GREAT NORTHERN CONCRETE TOBOGGAN TEAM	$7,500	
	FUNDING FOR CONFERENCE COSTS - CHEM ENG SOCIETY	$4,170	
	UW CASI FREE FLIGHT GLIDER TEAM 1998	$1,000	
	ADVANCED MOTOR CONTROLLER FOR MIDNIGHT SUN	$3,000	
	SAE AERO 98 WEEF PROPOSAL (US$602)	$842	
	FORMULA SAE WEEF PROPOSAL	$4,777	
	GNCTR HOSTING COMMITTEE	$3,000	
	ETHANOL CHALLENGE	$2,539	
	MINI BAJA '98	$2,320	**$29,149**
	TOTAL AMOUNT:		**$207,993**

Table of Contents

Equipment for Climate Station

Name: Jon F. Sykes
Email: sykesj@civoffice
Phone Number:: x3776
Position: Chair, Department of Civil Engineering

DESCRIPTION OF PROPOSAL:

The Department of Civil Engineering has developed an agreement with the Atmospheric Environment Service (AES) of Environment Canada to operate a climate station on the University of Waterloo Campus. The station consists of sensors to measure meteorologic parameters. The weather conditions will be recorded on a regular basis and the current conditions will be displayed at a web site. All data will be archived. The equipment and data will have a multitude of uses and users both within the Faculty and in the University Community.

The equipment can be installed at any time, however, there are no additional funds available to provide security at the site and communication to the site. This proposal will contribute to the completion of the project.

BENEFITS OF THE PROPOSAL:

The facility will illustrate the equipment used in the monitoring of environmental conditions. The equipment and data will be used for undergraduate teaching, in particular, ENV E 126 (Environmental Engineering Concepts), ENV E 330 (Lab Analysis and Field Sampling Techniques), and CIV E 486 (Hydrology). There will be provisions at the climate station for the installation of additional meteorologic sensors that could be used for specific courses, such as, Ch E 572 (Air Pollution Control), M E 564 (Aerodynamics) and M E 571 (Air Pollution), and design projects. The station will provide an excellent real dataset that can be used in all statistics courses.

COST BREAKDOWN OF PROPOSAL:

Standard climate station equipment	$30,000 (donated by AES)
Daily maintenance of equipment	8,000 per year (provided, in part, by Civil Engineering)
Security fencing/communication cable	4,600

shortfall ← + 6000 (Civ Eng) + 5000 (Geography) } Installation

AES has committed the equipment for the station for a renewable five year period, and Civil Engineering has agreed to cover their share of the daily maintenance costs. Plant Operations has agreed to install the fencing and communications equipment and Civil Engineering will install the climate station. Civil Engineering has prepared the mechanisms to make the data available in real-time and to archive the data.

Total $53,600

Partial, is an option

IMPLEMENTATION SCHEDULE FOR PROJECT:

The climate station will be setup as soon as the security fencing and communications equipment are installed. The climate station should be setup for September 1997.

Watstar Network Upgrade for Civil Engineering Students

Name: Michael Herz - no show
Email: mherz@uwaterloo.ca
Phone Number: ext. 3411
Position: Computer Systems Manager, Department of Civil Engineering

DESCRIPTION OF PROPOSAL:

As part of our ongoing upgrade program we would like to upgrade the network for the computers served by the Civil and Bridge Watstar servers. They are currently on 10Mbps Pronet. We would like to upgrade them to 100Mbps Ethernet.

BENEFITS OF THE PROPOSAL:

The current Pronet system is expensive to maintain and is obsolete. This new Ethernet is the new standard and will provide significantly better performance.

COST BREAKDOWN OF PROPOSAL:

total $12,706

	cost	quant	ext
10/100 PCI Network Cards	119	34	4,046
Tigerstack 100Mbps Hub 24 conn	3,449	2	6,898
Cat 5 Cable 1000'	428	4	1,712
RJ45 Connectors	1	50	50

IMPLEMENTATION:

The installation take a couple of days will take occur at the next break in classes.

ADDITIONAL:

The department fully supports this proposal and will provide up to 50% funding.

Air Sampling Equipment for Undergraduate Classes

Name: Prof. Susan A. Andrews
E-mail: saandrews@sunburn.uwaterloo.ca
Phone Number: x3344
Position: Assistant Professor

DESCRIPTION OF PROPOSAL:

Funds are requested for the purchase of a PAS-500 Air Sampler Multipump Kit and start-up accessories for investigating air quality phenomena in undergraduate laboratories. The cost of this equipment is $6272.33, including taxes.

PROPOSAL BENEFITS:

Availability of these air samplers will allow students to examine aspects of air quality that are not possible with the current resources. Labs that would be possible with these samplers would include, for example, measurement of dispersion of smoke from indoor smoking rooms, examination of the extent of air pollution from automobile exhaust along a busy roadway, or odorous substances from point sources such as sewage treatment plants. The current Env.E. 330 class (Field Sampling and Analysis) has expressed considerable interest in the air quality section of the course, and a lab related to this topic would be appreciated.

There is tremendous potential for students in many areas of Civil, Environmental and Geological Engineering to benefit from the purchase of the proposed equipment. While plans for this equipment currently involve Env.E. 330, it would also be available for use in other classes (e.g. potentially as a demonstration tool in first year classes) and for project courses (Civ.E. 300 and Civ.E. 400). Env.E. 330 currently has 30 students, approximately equally distributed between Environmental Engineering and Geological Engineering. Enrollment in the Environmental Engineering program is increasing, and coming terms will see it reach approximately double the current count. There is also a possibility that Env.E. 330 will be opened to other departments within Engineering (interest has been expressed from students in Chemical Engineering and Systems Design) or perhaps to students from outside the faculty (Earth Sciences, Science).

The multipump kit contains 8 samplers, which is enough for each of 8 groups of students to each have 1 for use in a lab. The labs in Env.E. 330 typically involve 7 or 8 groups of students. There is a cost savings of $129.40 (+ tax) in purchasing the kit vs 8 individual pumps.

COST BREAKDOWN:

Cat.No.	Item	Cost
2-4866	PAS-500 Air Sampler Multipump Kit (8 samplers) (single sampler = $555.30)	$4,313.00
2-4872	Carrying case for 8 pumps	86.55
2-4867	Tube holders for 6 mm tubes (8 x $21.70)	173.60
2-4868	Tube holders for 8 mm tubes (8 x $21.70)	173.60
2-4869	Tube holders for colorimetric tubes (8 x $25.85)	206.80
2-0228	Activated coconut charcoal tubes (8 x 100 mm), pkg of 50	85.50
2-0362	Carboxen-564 carbon molecular sieve tubes (6 x 70 mm) pkg of	2562.85
2-0832	Tenax TA adsorbent tubes (8 x 110 mm) pkg of 50	352.30
	Subtotal	$5,454.20
	Tax (GST, PST)	818.13
	Total	$6,272.33

IMPLEMENTATION SCHEDULE:

It is hoped that the equipment can be purchased and put in place before the next running of Env.E. 330, which is in the Spring term of 1998. To ensure that labs involving this equipment will produce consistent results, a lab preparation period of approximately 2 - 6 months could be required. Therefore, it would be ideal to receive this equipment early in the Fall term of 1997.

ADDITIONAL INFORMATION:

Pictures of the samplers will be brought to the meeting.

The students, staff and faculty involved in the many courses that could benefit from the use of the proposed equipment would be eternally grateful if this application was to be successful.

The potential exists for some matching funds to be made available from the Department of Civil Engineering for this application.

- partial funding available

(unsure as to $ amnts)

didn't have lab b/c no equipment existed

Developing a Computerized Technical-Writing Assistant

Name: Dr. Tarek Hegazy
E-mail: tarek@civoffice.watstar.uwaterloo.ca
Phone Number: 2174
Position: Assistant Professor

DESCRIPTION OF PROPOSAL:

Introduction

Technical writing is an essential skill that needs to be taught to every university student particularly in engineering and science disciplines. It not only helps students fulfill their course and work-term requirements but also contributes to their professional development and effectiveness in their work career. In a recent survey directed at errors in technical writing, it was shown that 50% of errors were associated with structure (organization, missing sections, etc.); 42% were associated with language (grammar, punctuation, word misuse, etc.); and 8% were associated with content (errors of fact). As such, the survey clearly identifies that organization and structure then language skills are the two main areas where improvements are needed most.

There are many tools on the market today that can assist in technical writing. These include a proliferation of books and articles with a lot of guidelines and examples. While this printed material is exhaustive and has been used for years, the learning rate is very slow and the material may have to be reviewed several times. Also, searching for a particular example or for an answer to an urgent question is time consuming and often frustrating. In addition to printed material, many general-purpose and customized software programs are available. Word-processing software programs (e.g., Microsoft Word, WordPerfect) have recently included a lot of powerful utilities including spelling check, thesaurus, and grammar check. They also come bundled with templates for different letter types, brochures, ads, and some report layouts. These software tools, as such, are helpful mainly in improving the written language, although they target the general public and not the specific needs of technical writing such as that required for our students' work-term reports. It is the objective of this proposal, therefore, to provide an educational tool for improving students' technical writing through the development of an innovative computer program "**Technical Writing Assistant**"

Objectives and Approach:

This project attempts to develop a computer program as a support tool for technical writing. The computer program will be an add-in to popular word-processing software programs, making use of their powerful utilities in improving the language of the written document. The objectives of the proposed project can be stated as follows:

1- Establish a ***library of report structures and layouts*** with identified subsections (e.g., abstract, Introduction, etc) that suit the different types of technical reports;

2- Establish a ***library of paragraph styles*** for each subsection, with logical sets of flow statements formed as templates, accommodating various report contents (e.g., theoretical issues, calculations, experiments, simulations, etc.);

3- Establish a ***library of good quality work-term reports*** ; and

4- Combine the three libraries into a ***user-friendly software program*** that can be activated from within popular word-processing software programs.

A large number of report types, books, and publications will be used to identify and index various report structures, paragraph styles, and examples. Parallel to that is the development of a user-friendly interface using MicroSoft Visual Basic programming. The Visual Basic compiler is simple to use and is available on the networked computers in the engineering department. The user interface consists of three main modules, as shown in the figure below, that will automatically interact with the created libraries: 1) a hierarchical outliner to provide the user with alternative report structures; 2) a text editor to allow the user enter text for the associated subsections and organize the paragraphs' logical flow, reflecting on previous paragraphs, and leading to the next ones; and 3) a file transfer module to facilitate the export of typed text to popular word-processing software.

PROPOSAL BENEFITS:

Perceived benefits of the proposed project can be summarized as follows:

- Help students develop better writing skills and minimize organization problems. This can be helpful in their course work and in their professional career;

- Speed the learning of technical writing material; and

- Provide a user-friendly non-traditional tool for teaching technical writing with ample examples. This tool can be used at our LAN and possibly by other institutions.

COST BREAKDOWN:

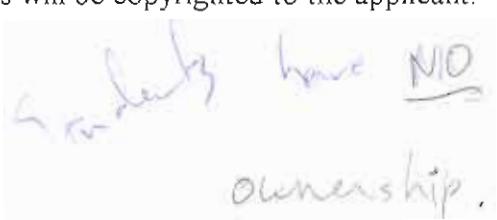
A total budget of **$18,000** is planned for the project; as follows:

- $7,500 a work-term student (Fall 1997);
- $7,500 a work-term student (Winter 1998); and
- $3,000 consultation with English Dept. and a system analyst.

IMPLEMENTATION SCHEDULE:

	Fall 1997				Winter 1998			
Task	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.
Develop a Library of Report Structures								
Develop a Library of Paragraph Styles								
Develop a Library of Examples								
Develop User Interface								
Refinements of Libraries								
Experiment with system								

The applicant will lead and supervise the developments at no charge. It is noted that the proposed project presents the development of a working prototype of the system. Due to time and cost limitations, it may not include all the desired features or a detailed user's manual, however, will be sufficient to demonstrate the workability and usefulness of the program. Also, it is noted that all developments will be copyrighted to the applicant.



Funding of Computer Workstations for Environmental Engineering

Prit Kotecha	pkotecha@env	884-9394
Sangesh Cudhail	sscudhail@env	886-0614
Charles Buck	cbuck@env	888-0600

DESCRIPTION OF PROPOSAL:

Last year, the Waterloo Engineering Endowment Fund funded the Environmental Engineering Students for the purchase of a server. This server allowed all environmental engineering students in the chemical and civil branch to be taken off the first year servers and placed on an environmental server. Four computers have been purchased by the chemical and civil engineering departments for the fourth year study room which is used by the highest class every term.

Presently, the computers are in high demand by both classes. Four computers restrict the individual usage of the computers. If a lab group is on the computers, for example, other individuals are unable to use the computers for small tasks. This proposal calls upon WEEF to fund for six stations in the fourth year study room

BENEFITS OF PROPOSAL:

- satisfy the need for further computers
- allow more students to work together instead of a one group monopoly
- lessen the load on the civil and chemical computer workstations
- increase class interaction in the fourth year study room

COST BREAKDOWN:

Option 1: Funding for 6 Computers

Unit price: $1600.00
Total for 6: $9600.00

Option 2: Funding for 4 Computers

Unit price: $1600.00
Total for 4: $6400.00

Upgrading of Analytical Facilities for ChE 032 Laboratory

3rd Yr. Lab

Name: Lillian Liao
E-mail: lliao@chemical
Phone Number: X6161
Position: Analytical Chemist

DESCRIPTION OF PROPOSAL:

To replace and upgrade laboratory equipment that is outdated and beyond repair.

BENEFITS OF THE PROPOSAL:

Access to this equipment would permit more accurate chemical determinations and improve success rate of experiments. It would also improve exposure to basic laboratory equipment. Approximately 150 students of ChE 032 would greatly benefit from this upgrade.

COST BREAKDOWN OF PROPOSAL:

	Item	Price	Use	Description
(1) a)	Analytical Balance	$2,570.00	to weigh out masses of less than 1g	Mettler SuperRange 210g capacity, readability 0.1mg
(2) b)	Maxipipettor	$575.00	to aliquot set volumes of liquid	Eppendorf Adjustable Volume 1 - 10mL
(3) c)	pH/ISE Meter	$1,180.00	to measure pH of solutions	Orion Benchtop Model 710A

IMPLEMENTATION SCHEDULE FOR PROJECT:

Equipment will be used once available.

ADDITIONAL INFORMATION:

Priority given to the Analytical Balance, item a) and the Maxipipettor, item b).
All prices are current and include taxes.

Summary

There has been an increase in the number of students that are enrolled in the course in the previous 2 years, from approximately 120 to 150. This has increased both space and equipment demands.

An analytical balance provides accurate measurements in the determination of dry cell weights, which is a crucial and elementary process for the evaluation of biomass. In lab 2, determining mass of procaryotes. In lab 6, determining mass of culture broth in bioreactors.

A pipettor allows repetitive measurements of volumes of liquid that is consistent and reproducible. This is vital in obtaining reliable results. In lab 6, a simulated industrial effluent experiment, serial dilutions are required to determine the IC50 of culture broth samples. In lab 4 and 5, again volumes of liquid are aliquoted to cuvettes to reach endpoint and absorbance measurements are taken to determine the rate of reaction.

The pH/ISE meter is a quick and easy to use instrument that is able to measure pH, concentration and temperature. These parameters are used in labs 4, 5, and 6 in controlling the rate of a reaction, e.g. enzyme kinetics.

Digital Storage Oscilloscopes

Name: William Ott
E-mail: wmott@eestaff
Phone Number: X6134
Position: E&CE Lab Director

DESCRIPTION OF PROPOSAL:

Propose to add 2 stations to the present 10 in the E&CE-380 lab. Digital storage oscilloscopes are required for each station. There are sufficient function generators, mother boards, and power supplies to complete the stations.

PROPOSED BENEFITS:

During the Fall terms, approximately 150 students use the 380 lab, with two (2) students per group, 75 groups have a requirement to access the present 10 stations. The 20 percent increased facilities would help alleviate time conflicts with other labes. This is a core course taken by all Electrical and Computer Engineering, plus some from other diciplines.

COST BREAKDOWN:

QTY	Item	Cost
1	Oscilloscope	2500
2	Oscilloscope	5000

IMPLEMENTATION SCHEDULE:

September 02, 1997 as this is the term with the heaviest demand for equipment.

Function Generators

Name: Paul Hayes
E-mail: phayes@eestaff
Phone Number: x3969
Position: Staff E&CE Dept.

DESCRIPTION OF PROPOSAL:

Replace older generators in E&CE labs.

Wavetek Function generator 40Mhx Model 395 suppled by Interfax

PROPOSAL BENEFITS:

The electrical and computer engineering students will use the generator(s) in the lab for E&CE 438, 439. All our current units are at least 10 years old.

COST BREAKDOWN:

$6684 plus tax ($695) = $7379

IMPLEMENTATION SCHEDULE:

As soon as purchased.

Unix Workstations

Name: Roger Sanderson
E-mail: rsanders@ece
Phone Number: x6184
Position: E&CE Staff

DESCRIPTION OF PROPOSAL:

The Electrical & Computer Engineering Department maintains a lab of Unix based Workstaions for upper year classes. There are currently fifteeen workstations and two servers on the system. Five of these workstations are Sun Sparc station 1 systems with monochrome screens. The current machines are past their estimated life span, and although still working fine, do not have sufficient computing power for some of our new application sofware. These stations are intended to be used in a multiuser environment, with 3 to 5 users per machine. The computing power of the Sparc 1 is about equal to a Pentium 75. This proposal is to buy up to five new Sun Ultra 1 Model 140 systems to replace these older machines.

PROPOSAL BENEFITS:

The workstations are used by all fourth year and some third year E&CE students.
The displaced machines could still be used, mostly as single user with older applications.

COST BREAKDOWN:

Sun Ultra 1 Model 140, with 17" monitor:	$8432
Taxes:	$877
Total:	$9309 each

Any number of computers, from 1 to 5 or any amount of money would be accepted.

AUTOCAD Stations for Design Studio

Name: M. Kaptein, Mechanical Engineering
E-mail: RKAP@SURYA
Phone Number: ext. 3026
Position: Laboratory Director, Mechanical Engineering

DESCRIPTION OF PROPOSAL

Mechanical Engineering and Civil Engineering are going to create several design studios. This would provide design facilities for final year projects and course design projects. Accreditation now requires a "senior design experience" for all students and therefore it is our intention to provide better design facilities. The design studios would provide CAD workstations, input/output devices, catalogues, design manuals, conference and meeting space, project space, etc. While our plans are preliminary, the Dean has made a commitment to proceed.

We would like to take 8 - 133 MHZ 486 computers being freed by WATSTAR Upgrades and convert them to AutoCAD Workstations. Larger Hard Discs, 17" monitors and network cards will be required. In addition a file server (Dell Pro 200 n) will be required.

In the long term we would add more stations including unix stations to run the IDEAS CAD package. This proposal is the first stage in a much larger project.

BENEFITS OF THE PROPOSAL:

This project would be available to all students in Civil and Mechanical Engineering. It will provide AutoCAD design facilities for student projects and course requirements.

COST BREAKDOWN OR PROPOSAL

Upgrade of 8 computers	
8 hard drives	$ 2400
8 17" monitors	$ 7120
8 Network Cards	$ 872
Dell Pro 200 n Server	$ 5500
Total	$15,892

The Department of Mechanical Engineering will provide 50% of the cost ($7946).

IMPLEMENTATION SCHEDULE FOR PROJECT

For September 1997, depending on availability of Watstar computers.

Laboratory Upgrade - ME 262

Name: M. Kaptein, Mechanical Engineering
E-mail: RKAP@SURYA
Phone Number: 3026
Position: Laboratory Director, Mechanical Engineering

DESCRIPTION OF PROPOSAL:

Mechanical Engineering students are introduced to microprocessors and digital logic systems in the course ME 262. Recent reevaluation of the course material as presented in the laboratory experiment showed the need for student hands on experience with programmable logic devices and programs. As such we need some equipment and a network language program to assist student understanding of logic control devices.

BENEFITS OF THE PROPOSAL:

This project will benefit all 2nd year Mechanical students (about 90).

COST BREAKDOWN OF PROPOSAL:

two eprom burners @ $250 each = $ 500.00
network CUPL program = $6487.00

IMPLEMENTATION SCHEDULE FOR PROJECT:

Summer 1997

Pressure Transducers - ME 353

Name: M. Kaptein, Mechanical Engineering
E-mail: RKAP@SURYUA
Phone Number: 3026
Position: Laboratory Director, Mechanical Engineering

DESCRIPTION OF PROPOSAL:

Mechanical Engineering Students have to perform a laboratory assignment in Heat Transfer I (ME353). The undergraduate lab consists of a tubular windtunnel equipped with data acquisition instrumentation to measure airflow and heat balances. The pressure sensing equipment is about 25 years old and its vacuum tube amplifier circuits are so unstable that the system is no longer suitable.

BENEFITS OF THE PROPOSAL:

This project will benefit all students participating in the core course in Mechanical Engineering about 80-90 students and ME 482 project students.

COST BREAKDOWN OF PROPOSAL:

4 pressure transducers at $725 = $2,900.00

IMPLEMENTATION SCHEDULE FOR PROJECT:

Summer 1997

Pump Performance Demostration Laboratories

Name: M. Kaptein, Mechanical Engineering
E-mail: RKAP@SURYA
Phone Number: 3026
Position: Laboratory Director, Mechanical Engineering

DESCRIPTION OF PROPOSAL:

Many Mechanical Engineering students will have to analyze a flow network in a work term or in the course of their career. The theory for pump/piping systems is presented in ME 351 Fluid Mechanics I and ME 362 Fluid Mechanics II and in the advanced course ME 563 Turbomachines, ME 566 Fluid Mechanics III and ME 569 Fluids Design Topics At present in ME 351, an air flow laboratory demonstrates the concepts of flow measurement and losses in pipe flow. The new laboratory will be used in various forms in ME 362, ME 569 and potentially ME 566.

BENEFITS OF THE PROPOSAL:

This project will benefit all Mechanical students in the core course in Mechanical Engineering about 80-90 students and ME 482 project students

COST BREAKDOWN OF PROPOSAL:

For the initial lab setup based on a water flow loop the following equipment is required per unit:

- Pump with speed control	$1,000
- Flow meters, gauges, Tach	$1,600
- Dynamometer	$2,000
- Piping, Valves	$1,000
	$5,600

IMPLEMENTATION SCHEDULE FOR PROJECT:

Winter 1997

Computer Controlled Data Acquisition System for Geotechnical Engineering Lab (CE-353)

Submitted by: Giovanni Cascante, Ken Bowman
Email: gcascant@civoffice, kbowman@civoffice
Phone Numbers: 2098, 3656
Positions: Assistant Professor, Lab Technician

DESCRIPTION OF PROPOSAL:

A traditional instrument is self-contained, with signal input/output capabilities and fixed user-interface features. Inside the box, specialized circuitry includes: analog-to-digital (A/D) converters, signal conditioning, microprocessors, memory, and internal communication bus. The devices, then, convert real-world signals to results for the user. On the other hand, virtual instrumentation empowered engineers to develop customized systems using computers as the engine for instrumentation. The basic components of a virtual instrument are: transducers, one A/D card, one computer, and a specific software to link the hardware. This proposal is for a virtual instrument or computer controlled data acquisition system to be used in the Geotechnical Engineering Lab. This equipment will be used to update and enhance the consolidation and the triaxial tests, which are two of the four laboratory tests required in the CE-353 course. In addition, the equipment could also be used in any other course or project that may require a data acquisition system. The proposed system can provide control for a maximum of eight transducers. These transducers could be load cells, linear displacement transducers (LVDT), strain gages, thermocouples, or any other transducer that generates a voltage (+/- 10V) as a response of a given excitation.

The proposed transducers are two LVDTs for two oedometers used in the consolidation test. No transducer is needed for the triaxial test, because the apparatus already has a load cell. The proposed A/D card is the PCI-MIO-16E4, which has eight differential channels and a sampling rate of 250k. This card is compatible with LabView, which is a graphical programming software that permits a fast and easy development of customized applications. The A/C card and LabView will be installed in a Pentium 166 MHz computer. Once that the application is ready, it can be saved as an executable file, which can be used in any other computer with the specified A/D card. Therefore, with one license of the program, many projects could get the benefit of this software.

BENEFITS OF PROPOSAL:

- The proposed equipment will update and enhance the geotechnical engineering lab to reflect the technological developments that are used today by industry.

- The proposed equipment can be used for different applications that require a data acquisition system. Then, it could be used in any experimental course or project (400-project, work-term project). The virtual instrument technology permits simulation of measuring devices such as oscilloscopes and multimeters.
- Students can upgrade laboratory tests by making them computer-controlled. So, the next class will benefit from it, and enhance the existing application by adding new modules to it.
- Students working on projects that involve data acquisition can speed up the data collection and processing by transferring the data directly from the measuring device to a spreadsheet for example.
- Students will get experience on instrumentation, which is an area of increasing concern in industry Development of techniques that can be economically implemented is clearly of interest to many industries, including regulatory agencies.

COST BREAKDOWN:

Two linear displacement transducers (LVDT)	$800.00
Analog-to-Digital card with 8 channels (Including 10% discount for teaching purposes)	$1,300.00
LabView Software: (Including 35% discount for teaching purposes)	$1,900.00
166 MHz computer (Including 10% discount for teaching purposes)	$3,000.00
Total	$7,000.00

IMPLEMENTATION SCHEDULE:

LabView provides a very friendly programming environment, and includes tutorials for different applications. A couple of days is required to start using the software at a basic level. The interconnection of the equipment for the consolidation test and triaxial test is expected to take one term each. This will be done as a 400-projects. Then, students willing to use this instrumentation software could start their projects immediately, after the purchase of the equipment.

Proposal for 2 additional workstations for the Geological Study Room

Name: ~~Dan Elliott~~ Jeff MacDonald
E-mail: deelliot@civil
Phone Number: 884-9797
Position: 3A Geological Engineering Student

DESCRIPTION OF PROPOSAL:

To add two additional workstations to the Geo Room.

PROPOSAL BENEFITS:

This would enable all Geological Engineering Students to have a better access to computer facilities on campus, as this room is limited to Geological Engineers. This upgrade would also aid in empowering groups to work together. These computers would allow us to install important stand-alone programs that are important to our studies.

COST BREAKDOWN:

Initial cost analysis has placed the cost of each of these computers, with monitors to be $1250.
This makes the total cost of the proposal to be worth $2500.

IMPLEMENTATION SCHEDULE:

The goal would be for the fall of 97, which would coincide with the upgrade to the watstar system.

Hard Disks for the Systems Design Engineering WATSTAR Server

Name: Mike Brewster, Dave Walsh
E-mail: mkbrewst@zeus.uwaterloo.ca , dwalsh@zeus.uwaterloo.ca
Phone Number: ext 2234
Position: Student , Staff

DESCRIPTION OF PROPOSAL:

The Department of Systems Design is continuing to update and enhance its undergraduate computing facility. We have recently purchased a Pentium 200 and Ultra Wide SCSI controller as part of an upgrade to our WATSTAR server. We would like WEEF to help us complete the upgrade with the purchase of three 2.1 Gig UltraWide SCSI hard drives.

PROPOSAL BENEFITS:

The Systems WATSTAR server was purchsed in 1992 along with a 2.1 and a 1.3 gig hard drive. We feel that these disks are quickly approaching their life expectancies, and that the addition of three new disks would service the needs of our undergraduate students for years to come.

The addition of the new dirives will bring Systems beyond the present requirements of WATSTAR ie. WIN95 compliances, 100 megabit PCI ethernet card, minimum disk space per student jumping from 5 to 10 meg. There are a number computers from other departments and student organizations that are directly connected to our server that would also benefit from this upgrade. They are Electrical Engineering, Civil Engineering, WEEF office, Iron Warrior office, Engineering Graphics and the C&D.

COST BREAKDOWN:

3 - IBM 2.1 GIG Ultra Wide SCSI Hard Drive (5 year warranty)

	$ 754
taxes	$ 233
Total	$ 2495

Partial funding for requested equipment is also acceptable.

IMPLEMENTATION SCHEDULE:

If funds are approved, the hard drives will be ordered immediately and installed upon arrival.

Systems Design Engineering Undergraduate Analog Circuits Laboratory Upgrade

Name:	Dan Stashuk	and	Kevin Krauel
Email:	stashuk@watnow		kbkrauel@kingcong
Phone:	x2982		x5760
Positions:	Associate Professor		Lab Director

DESCRIPTION OF PROPOSAL:

The Department of Systems Design Engineering has recently initiated a program to upgrade its undergraduate laboratories. In this regard eight (8) Pentium-based computer stations were purchased last year to replace existing NeXt workstations because there is a much greater selection of software for, and off-the-shelf lab apparatuses that can be interfaced to, Intel-based personal computers (PCs). For example, the control systems experiments that were recently purchased for our core third year "Introduction to Control Systems" lab course (SYDE 352), are designed to be interfaced to PCs. Similarly, we have recently purchased digital circuit simulation software that runs on PCs for our core first year "Digital Systems" lab course (SYDE 192). The NeXt stations have A/D data acquisition capabilities and it is required that the new Pentium-based systems also be equipped with similar capabilities to support our core analog circuits and instrumentation course (SYDE 292). We have researched various sources of PC-based data acquisition boards and have discovered a relatively low cost solution to our needs. We are requesting funding to support the purchase of ten (10) ComputerBoards, Inc. CIO-DAS08/Jr-AO data acquisition boards, associated cables and terminal boards. Of the variety of data acquisition boards currently available, which can meet the needs of SYDE 292, these data acquisition boards are the least expensive. The boards provide medium speed, eight (8) channel analog to digital input (with 12 bit sampling) and 2 channel digital to analog output. These boards are not high performance boards, but they will provide the functionality required by the SYDE 292 course content for a modest price and could still be of use in third and fourth year workshops.

BENEFITS OF PROPOSAL:

The objectives of the SYDE 292 course are to have students develop an understanding of the principles and practices involved in making physical measurements. Therefore, the students study basic circuit theory, instrumentation devices and measurement concepts. Currently, all modern measurement devices ultimately interface with some form of digital system and therefore having the students consider the essential aspects of analog to digital data acquisition and digital to analog data output are essential. The funding requested is for the purchase of equipment which will allow the students to effectively study the digital interface of measurement devices. SYDE 292 is a core System Design Engineering course and therefore has an enrollment of approximately 80 students each Fall term. In addition, having the laboratory equipped for data acquisition could facilitate some third and fourth year workshop projects.

COST BREAKDOWN OF PROPOSAL:

The complete cost breakdown is as follows:

Qty	Description	Unit Price	Cost
10	CIO-DAS08/Jr-AO 8 Channel A/D Data Acquisition modules with 2 Channels of D/A output	194.40	1,944.00
10	CIO-MINI37 Universal Screw terminal	63.90	639.00
10	C37FFS-5 5 ft of shielded cable	39.60	396.00
Approximate shipping costs			20.00
Approximate taxes (roughly 10.2%)			300.00
			=======
Total			**$3,299.00**

Partial funding for requested equipment would also be appreciated.

IMPLEMENTATION SCHEDULE:

The data acquisition boards and associated equipment will be ordered as soon as possible so that the boards can be installed and linked with appropriate software drivers and graphical user interfaces for functional operation for the Fall 97 offering of SYDE 292.

Summary of Important Points:

There are three points which we would like to emphasize:

1. The requested or similar equipment must be purchased and installed for subsequent offerings of SYDE 292.

2. The equipment, for which funding is requested, was selected so that the needs of the SYDE 292 course and a wide variety of third and fourth year workshops could be met at minimal cost.

3. The upgraded lab will provide immediate benefits to approximately 80 second year students each Fall term, as well as possibly facilitating third and fourth year undergraduate workshops throughout each year.

Purchase of Working Model Software

Name: John McPhee,
Email: mcphee@real
Phone Number: ext.5341
Position: Professor, Systems Design Engineering

DESCRIPTION:

Working Model is a software package that will automatically perform a static, kinematic, or dynamic analysis of a given mechanical system. Systems are created graphically, by selecting icons that represent bodies, joints, springs, dampers, forces, gears, et cetera. By automating the analysis of a system, the engineer can spend more time on the creative aspects of the design process.

Currently, I have 20 copies of Working Model 3.0 installed on the Watstar network, running under Windows 3.1. My proposal is that WEEF provide funding for an upgrade to version 4.0 of this software; a secondary proposal is that WEEF purchase a single copy of Working Model 3D, for evaluation purposes.

BENEFITS:

Working Model 4.0 is a 32-bit application, running under Windows'95 or NT, that runs 3-10 times faster than previous versions. Since plans are afoot to provide Windows'95 on the Watstar network, we will have a platform on which to provide Working Model 4.0 to UW students. Although version 4.0 does offer some additional modelling capabilities, its main advantage over 3.0 is its speed of simulation. Neither version is capable of modelling three-dimensional systems such as industrial robots and vehicle suspensions; the new Working Model 3D software provides this capability.

Currently, Working Model 3.0 is used in both SD 382 and ME 321; demonstrations of Working Model were given in both of these courses this term. It is also used in workshop projects in Systems Design and Mechanical Engineering, as well as some 500-level courses. The Systems Design and Mechanical Engineering courses in Advanced Dynamics might particularly benefit from the use of Working Model 3D.

COSTS:

U.S. $1080 for upgrade of 20 copies of Working Model 3.0 } partial
(includes cost of manuals, as well as extra modelling tools for Autocad and beams)

U.S. $495 for purchase of Working Model 3D

IMPLEMENTATION:

Assuming Windows'95 is in place on Watstar by the Fall'97 term, the new software could be used in the Advanced Dynamics courses in Systems Design and Mechanical Engineering, and in SD 382 and ME 321 next Winter ('98).

Notcher Student Shop

Chris Salisbury - student

Name:	C. Wallace, Engineering Student Shop
Phone Number:	2301
Title:	Supervisor, Engineering Student Shop

DESCRIPTION OF PROPOSAL:

The Engineering Student Machine Shop provides excellent hands-on experience for all undergraduate students, either for core class courses or special projects. To improve our sheet metal fabrication area we require a notching machine.

BENEFITS OF PROPOSAL:

All Engineering Students (Faculty wide)

COST BREAKDOWN OF THE PROPOSAL:

Model #16-18 notching machine and stand $1,779.00 (including all taxes)

IMPLEMENTATION SCHEDULE FOR PROJECT:

Summer 1997

benefits student projects

Replacement Printers for Computing Labs

Name:	Professor Beth Jewkes, Engineering Computing Martin MacLeod, Engineering Computing
E-mail:	emjewkes@mansci, martin@development
Phone Number:	888-4601
Position:	Associate Dean for Engineering Computing

DESCRIPTION OF PROPOSAL:

The majority of undergraduate printing in Engineering is done using the five main Watstar printers:

Helix	EL 108
Wheel	E2 1308
Wedge & Shim	E2 1302B
Gaff	CPH 2367
Office	CPH 2367

The printers are HPIIISi, 300 DPI PostScript printers with duplex abilities. Two of the printers are 6 years old, the other three are 5.5 years old. These printers have a rated lifespan of one million pages, most of which have surpassed this number. Over the years these printers have proved very reliable and efficient, but they are getting to the point where their reliability is in question and operating costs are increasing. It was deemed important to replace these printers in the 1996/1997 year, but due to other upgrades, purchasing new printers was delayed for a year. They should be replaced this year, preferably by the fall.

PROPOSED BENEFITS:

The advantages of the newer printers will be:

- a newer version of Adobe Postscript printer software. This will increase processing speed by moving tasks into hardware
- a faster CPU that will speed time to process output
- higher dpi resolution, especially important when trying to get better quality output.
- more reliable, cost effective printers.

COST BREAKDOWN:

Quantity	Description	Unit price	Total Cost
4	HP Laserjet 5M (6M, 12ppm, PS)	2219	
4	HP 4M Memory upgrade	101	
4	HP Duplex Unit for Laserjet 5M	675	
4	HP 500 sheet tray, to replace 250 tray	140	
4	HP 500 Sheet Tray Assembly, to add an extra 500 sheets	305	
	Total before taxes	3440	
			$13,760

Note: the proposal to WEEF is to replace four printers, the fifth printer will be purchased by Engineering Computing so that all printers will be replaced.

IMPLEMENTATION SCHEDULE:

It is our plan to order the printers in August for a September 1997 implementation.

ADDITIONAL INFORMATION:

If WEEF is unable to provide full funding for this project, partial funding would be welcome.

Recognition of WEEF support will given by erecting signs beside the printer "hole-in-the-wall".

Helix / Wheel / Wedge

The 1998 Great Northern Concrete Toboggan Team

Name: Lana Russell, Sharla Howard, Jody Wood
E-mail: lrussell@bridge, sdhoward@bridge
Phone Numbers: 746-7246
Position: Students

DESCRIPTION OF PROPOSAL:

The Great Northern Concrete Toboggan Race is an annual design competition involving universities from across Canada and the United States. This year's race was held in Ottawa and was composed of approximately 25 teams. The 1998 competition will be held in Calgary.
The objective of the competition is to design and construct a toboggan with a concrete running surface, breaking and safety systems, and the capacity for five riders. Entries are judged based on technical presentation, sled design and logistics, and overall team spirit.

BENEFITS OF THE PROPOSAL:

The Great Northern Concrete Toboggan Race allows students to apply many of the concepts developed through the civil engineering cirriculum. Not only does this competition allow application of principles studied, but it also strengthens the reputation of Waterloo internationally. The project involves 30 fourth year civil engineering students.

COST BREAKDOWN OF PROPOSAL:

The 1998 team is presently in the process of designing two toboggans, and fundraising efforts have been in full swing since the beginning of the summer 1997 school term. At this time we require funding for:

- initiating fundraising events (eg. down payment to rent a bingo hall)
- updating and reprinting our promotional packages (which are used to solicit sponsorship from businesses)
- purchasing of building materials
- increasing our fund to transport the 30 people involved to Calgary
- registration fees ($100/person)

Request funding in the range of $7,500.00. (Partial funding is welcome)

IMPLEMENTATION SCHEDULE FOR THE PROJECT:

Currently the project is already under way, all Arctic Fire members are soliciting sponsorship from family, friends and the business sector. Burger Sales are happening every Thursday from 11:30am - 2:00pm, and the design of two sleds is already underway. Additionally each team member has contributed $125 towards the team.
It is the goal of Arctic Fire to raise $30,000 by February 1998. We plan to accomplish this in the next seven months by continuing our sponsorship campaign and by having several fundraising events.

ADDITIONAL INFORMATION:

Important points to consider regarding the proposal:

- In 1998 the University of Waterloo will be represented by only one team due to the destreaming of the civil engineering classes.
- Arctic Fire's race is in February of 1998, that's less than one year away!
- Arctic Fire will be competing in Calgary, the cost of transporting 30 people and two toboggans to Calgary will be immense.

Waterloo always does well at these competitions, we placed 1st and 3rd in the 1997 competition, thus the races enhance Waterloo's reputation.

Funding for Conference Costs - UW Chem Eng Soc

Name: Prit Kotecha and Alex Jay
E-mail: pkotecha@env and aajay@chemical
Phone Number: (519) 884-9394

DESCRIPTION OF PROPOSAL.

In October 1997, the Chemical Engineering Society will send approximately ten student representatives to Edmonton to participate in the 47th Annual Canadian Society for Chemical Engineers conference. The student delegation from the University of Waterloo will be comprised of chemical and environmental engineering students from first to fourth year.

This proposal calls upon the Waterloo Engineering Endowment Fund to partially fund for associated conference costs, i.e., transportation, accommodation and conference fees.

PROPOSAL BENEFITS

This proposal has the following benefits to chemical and environmental engineering students:

- affect students in all years in chemical and environmental engineering
- develop career goals through exposure to diverse disciplines
- acquire solid understanding of the many industrial applications of chemical engineering
- increase awareness of current issues while gaining an educational advantage
- gain ideas for future symposiums and design competitions

This proposal has the following benefits to all engineering students:

- represent the school as UW engineering ambassadors
- strengthen industrial ties with the University of Waterloo

Furthermore, an article will be submitted to the Iron Warrior to show how the student representatives, and UW engineering , benefited from the conference.

COST BREAKDOWN:

Option 1

Cost of Flight:	10 * 280 = $2800
Cost of Registration:	10 * 40 = $400
Cost of Hotel:	10 * 97 = $970
Total:	$4170

Option 2

Cost of Flight	10 * 280 = $2800
Cost of Registration:	10 * 40 = $400
Total:	$3200

It should be noted that additional sources of funding are being sought, e.g., sponsors of conference, car wash, department funding, and other events.

UW CASI Free Flight Glider Team 1998

Name: Gregory Thompson
E-mail: g2thomps@novice.uwaterloo ca
Phone Number: (519) 884-7519
Position: Project Manager

DESCRIPTION OF PROPOSAL:

We are looking for WEEF to sponsor our 1998 team for our competition in May of 1998 We require funds to allow us to purchase materials for construction of a series of prototypes for the new 1998 glider design, plus equipment for use in the windtunnels.

PROPOSAL BENEFITS:

- The competition is a national competition against schools from Ontario, Quebec and the Western Provinces. We are currently the national champions. Our team won the 1997 competition in Ottawa with our flying wing glider. We would like to effectively defend our title.
- We are currently investigating and making preparations for hosting the competition in 1998.
- The project is a lead in to ME564 Aerodynamics, ME 533 Composite Materials, ME 482 Project Course plus all of the basics (MODS etc...)
- We have in the past obtained sponsorship from many large aerospace companies including de Havilland, and AlliedSignal Aerospace.
- The equipment we purchase can be used for other teams plus the equipment will be assets for future glider projects.

COST BREAKDOWN:

We are looking for funding for:

Materials	Styrofoam Insulation	$400
	Kevlar	$50
Equipment	Used Video Recorder	$300
	Portable Wind Speed Indicator	$100
	Specialty Textbooks	$150
Total		**$1000**

PARTIAL FUNDING OPTION:
Materials and Wind speed indicator: $550

IMPLEMENTATION SCHEDULE:

The competition is in May of 1998 so it is a long way off, however we are beginning development of the new glider now Our preliminary schedule is:

Hosting go/no-go Decision	August 1, 1997
General Design	September 1, 1997
First Series of Prototypes	November, 1997
Re-design	December, 1997
Final Series of Prototypes	January, 1998
Report Due	March 31, 1998
Competition Gliders Finished	April 15, 1998
Competition	May 9-11, 1998

ADDITIONAL INFORMATION:

Background on the Team:

The UW CASI Free Flight Glider team is a group of students who are constructing a glider which will be entered in a National Competition in May of 1998, sponsored by the Canadian Aeronautics and Space Institute (CASI). This will be the third entry into the competition for the team. In May of 1997 we traveled to Ottawa with a radical new design, a flying wing. Using this glider we won the competition after only the first day of flight trials. Our glider was very well suited for the competition, flying extremely well. The glider was able to carry the largest payload of the competition for the longest time, however previous designs had better capabilities to our glider. The intention for 1998 is to improve on the existing design by selecting new airfoils which are more optimized for higher lift and lower drag. Our hope is to build a glider which will far surpass the 1997 design.

Level of Development:

Using the information we gained from the development of the 1997 flying wing we are currently performing more research into flying wing gliders to allow us to choose more optimized airfoils, and a better aerodynamic design. Using the windtunnels we plan on performing flow visualization tests which will aid us in our re-design of the glider. Along with the research our team is trying to perfect the test methods in the wind tunnel so we will obtain accurate results. We plan on testing the glider design in both of the windtunnels on campus plus a series of flight tests. Using the results from these tests plus from research we hope to again come home with the distinction of national champions.

Advanced Motor Controller for the Midnight Sun Solar Race Car

Name: Steve Burany
E-mail: steve@midnightsun.uwaterloo.ca
Phone Number: x2978
Position: Project leader, Midnight Sun V

DESCRIPTION OF PROPOSAL:

The Midnight Sun Solar Car team wishes to purchase an advanced motor controller from New Generation Motors. The new controller is more efficient than the current one (upwards of 97%), would allow greater low-end torque and improved reliability.

PROPOSAL BENEFITS:

A new motor controller would mean a more efficient drive system and increased reliability for the car. It would allow the current motor controller to be disassembled and improved on by students at the university for further races.

COST BREAKDOWN:

After arranging a discount with New Generation Motors, the new controller will cost the project $3,000. We would appreciate any amount of money WEEF could put forward towards this purchase.

IMPLEMENTATION SCHEDULE:

The project wishes to purchase the controller as soon as possible because we are planning on characterizing the solar car in the coming month.

ADDITIONAL INFORMATION:

Midnight Sun IV has just finished 7th in Sunrayce '97. This has been the best position ever achieved by this school, and we are also currently the top Canadian team.

In October '98, the car is going to be racing in the World's Solar Challenge in Australia.

SAE AERO 98 WEEF Proposal - Vacuum Bagging System and Equipment

Name: Leon Barbulovic-Nad
E-mail: lbarbulo@novice.uwaterloo.ca
Phone Number: 886-8006
Position: Team Leader

DESCRIPTION OF PROPOSAL:

The SAE Aero 98 Team is proposing the purchase of equipment that will significantly increase the quality and capability of our 1998 entry into the SAE Aero Design East competition. It is our opinion that a stronger and lighter aircraft will help us succeed in building an winning entry to the competition. We will be exploring the use of carbon fibre and other composite materials in our entry, particularly in our wing design. In order to properly manufacture a carbon-fibre wing, the SAE Aero 98 Team requires the purchase of a Vacuum-Bagging System.

PROPOSAL BENEFITS:

The Vacuum Bagging System and related equipment will greatly benefit the University of Waterloos SAE AERO Team. This year, new techniques for laminating composite materials with epoxy will be introduced and utilized. Skinned carbon fiber wings will be constructed to compete in SAE Aero Design East contest. The purchase of this equipment will give us an opportunity to explore the capabilities of new materials and determine their future potential.

COST BREAKDOWN:

The Vacuum Bagging System includes the pump, the regulator assembly for an industrial pump and assorted vacuum bagging supplies:

DELUXE PRO BAGGING SYSTEM FOR COMPOSITE SKINS AND MOLDED PARTS

295.00 US

Includes:
- Industrial Pump
- Regulator Assembly
- 18 Nylon Tube 3 yd.
- Mylar 2 ft. X 6 ft.
- Stretch Film 60 in. X 2 yd.
- 15 in. Perforated Release Film 12 yd.
- 15 in. Breather 12 yd.
- Sample Wax
- Tacky Tape Sealant
- Breather Strips 2 in. X 12 ft.
- Vacuum Line 2 yd.
- Instructions

$ 295.00 US

FILTER/TRAP	21.25 US
BRASS GANG VALVE	12.00 US
SUPER GOLD THIN (2 OZ.) - CYANOACRYLATE GLUE	17.25 US
SUPER GOLD GAP FILLER (2 OZ.) - CYANOACRYLATE GLUE	17.25 US
WEST SYSTEM 105 RESIN (0.98 GALLON)	56.65 US
WEST SYSTEM 209 EXTRA SLOW HARDENER	38.95 US
WEST SYSTEM 410 MICROLIGHT FILLER (5 OZ.)	18.35 US
CARBON FABRICS (2.25 OZ. - 3.5 OZ.)	APPROX. 100.00 US
HAZARDOUS MATERIALS HANDLING AND SHIPPING	APPROX. 25.00 US
	Total: 601.70 US

We appreciate your consideration on this proposal.

Formula SAE WEEF Proposal

Name: Douglas Zister
E-mail: djzister@mechanical
Phone Number: 747-4772, on campus ext. 5904
Position: Team leader

DESCRIPTION OF PROPOSAL:

The current engines which are used in the FSAE car have been in use since 1990. One of the engines is a 1987 model and the other is a 1988 model. Both motors have been blown in the past couple of months and it is essential to replace these aged motors with newer models. The newer models weigh 30 lbs less than the older engines. This is a significant amount of weigh considering that the total weight of the car is only 502lb. It is also getting very difficult to get parts for the older motors. At this years competition there were only a handful of teams still running the older model engines. We placed 8th out of 88 and were the top Canadian team and feel that we must upgrade to remain competitive.
We require two new engines, one for use in the car, and the other for testing on the engine dynamometer (which also serves as a back up engine).

Also, the newer model engines will require us to also purchase new fuel injection computers. The current computers have also been in use since 1990 and cannot handle the increased rpm limit of the newer model engines.

We also propose to buy a new socket set and screw driver set for use in the engine testing room.
For test driving, we require an additional 20 pylons.

PROPOSAL BENEFITS:

The Formula SAE team is made up of students from all years and disciplines although it is dominantly a 4th year Mechanical. We are always looking to expand into other disciplines and younger years.
The benefits of new engines and fuel injection computers will be to many engineering students. The last motors were used by seven different Formula SAE teams. Therefore, it is easy to see that many future teams will benefit from new equiptment. We ask you to keep this in mind when you see our total proposal amount. We realize this is alot of funding to request, but this is a large purchase which only gets made once every six or seven years.
The new tools and pylons are equiptment that have an indefinite life with the Formula SAE teams.

COST BREAKDOWN:

Required: 2 Honda CBR 600 F3 engines - costed at a motorcycle shop - $1200 each - $2400 total

-Requested from WEEF - $1500

2 Motec fuel management systems - List Price: $5000 each

- FSAE discounted price: $3500each - $7000 total

- Requested from WEEF - $3000

1 Socket set - **$103.49**

1 Screwdriver set - **$34.49**

20 new pylons @ 6.95 each = **$139**

Total funds requested from WEEF = $4776.98

Great Northern Concrete Toboggan Race Hosting Committee

Dear WEEF representatives,

Over the past several years, various concrete toboggan teams have benefited from the gracious generosity of WEEF, but this is not a request for money to help fund a team.

The Great Northern Concrete Toboggan Races have been taking place since 1974 and every year, the organizers try to swtich the hosting of the races between the east coast and the west coast of Canada. Since the races will be in Calgary in 1998, they will return to the east coast in 1999 and this is where this proposal comes into play.

The Waterloo hosting committee would like to place a bid to host the GNCTR in 1999. To do so, a bid needs to be entered when the races take place in Calgary, in February. The organizing committee would like to travel to Calgary to enter a bid and see everything that will be required of them if Waterloo is granted the races.

It is of WEEF that we ask for a donations of **$3000**. This would cover travel cost ($400 per person) and accommodation ($100 per person) for the organizing committee which will consist of 6 Waterloo Engineering students.

By funding this organizing committee, WEEF will be funding a great opportunity to spread the name of Waterloo to engineering schools world-wide. This is a golden opportunity not only to win the concrete toboggan but to do it on our own turf.

Mark Popik
Chair of the Organizing Commitee

Ethanol Challenge

Name: Rishi Gautam
E-mail: rgautam@mechanical
Phone Number: 725-4595
Position: Director of Sponsorship and Marketing

DESCRIPTION OF PROPOSAL:

The Ethanol Challenge is the latest in a series of alternative fuel competitions sponsored by the "Big Three" automakers. Last year, in the Chrysler sponsored Propane Challenge, UW finished first despite being new to these alternative fuel events. This year, General Motors, Natural Resources Canada and the United States Department of Energy are staging an event in May of 1998 where Universities from across North America will be trying to see who can do the best job of converting a Chevrolet Malibu for dedicated ethanol use.

Armed with the knowledge of last year's team, the University of Waterloo should be able to achieve another first place finish in the challenge.

PROPOSAL BENEFITS:

A competition such as the Ethanol Challenge provides students with the chance to work with current technology, to try to solve pressing industry needs. In this case, the use of the renewable resource ethanol, provides an environmentally friendly alternative to traditional gasoline engines.

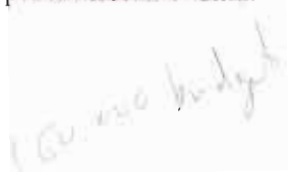
In addition, with major corporate sponsorship from General Motors, and the Governments of both Canada and the United States, this event will gain publicity throughout North America. Yet another strong finish in this high profile competition will go a long way to enhancing the University of Waterloo's North American reputation.

COST BREAKDOWN:

Air Line: $22.00
Air Tool Accessory Kit: $23.00
Axle Stands: 4 x $22.00 = $88.00
2.5 ton Jack: $110.00
Engine Hoist: $1000.00
Engine Stand: $215.00
Travel Expenses: $750.00

IMPLEMENTATION SCHEDULE:

At the current time, the efforts of the team are focused on obtaining corporate sponsorship and generating preliminary designs. The items listed above, save for the travel expenses, will be needed to implement the design changes, once the vehicle and additional engine are delivered in August. The travel expenses will be used as soon as possible to help with the costs of taking the existing vehicle to various promotional events.



Title: Mini Baja 98

Submitted By: Donovan Watts
Your Name: Donovan Watts
E-mail:d2watts@mechanical
Phone Number: 725-4595
Position: Mini-baja co-captain

Description of Proposal:

The SAE Mini Baja competition involves designing and constructing a single seat off-road vehicle. The University of Waterloo has been competing for many years and is always competitive with several top 10 finishes. The 1997 team received a first place for originality. The 1998 competition will be held in Milwaukee, Wisconsin at the end of may.

Proposal Benefits:

In the past the team has given many people the chance to learn how to be part of a team , and many other valuable skills like time management, machining, design, and CAD work. Also students have gained credit for there ME 482 and ME 321 on this project. The 1998 team will be no different, in that many people will gain many skills.

Cost Breakdown:

2	Trailer	900.00
3	Brakes	200.00
4	Steering rack	200.00
1	Hydraulic motors	500.00
7	Goggles	45.00
6	Travel	300.00
5	Entrance fee	175.00
	Total	**2320.00**

Implementation Schedule:

When WEEF provides the commitment for funding, work can begin on restoring the trailer and fixing the hydraulic drivetrain on the mini baja car.

Additional Information:

By re-using the 1997 chassis, overall costs of the car will be kept down. The funds received by WEEF will allow us to fix up the trailer which would benefit all the teams. The left front brake on our car are seized, the steering rack is five years old and has an incredible amount of play, the seals in the hydraulic motors were blown in the competition.