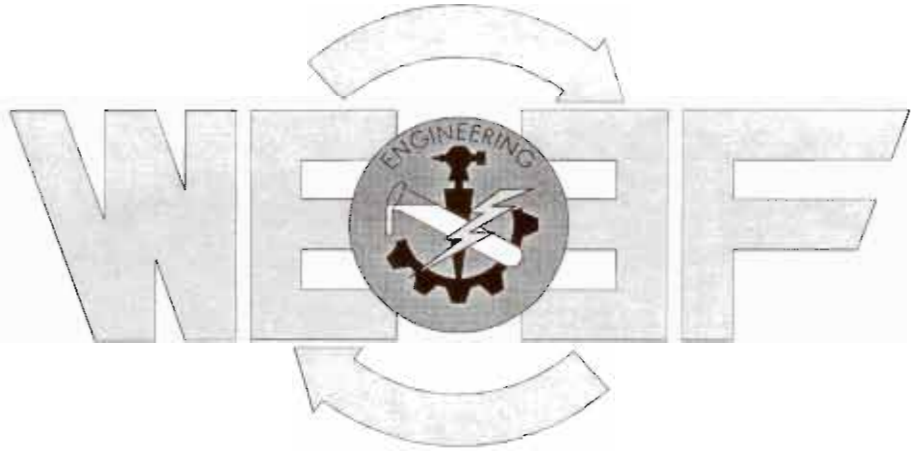
WEEF Proposals & Allocations	Spring 2001	
Chemical and Environmental Chemical	Requested	Allocated
Shell & Tube Heat Exchanger Software	$ 5,200.00	$ 5,200.00
		$ 5,200.00
Electrical and Computer		
Printer for Electronic Circuits Course	$ 300.00	$ 300.00
E&CE Computer Rooms Monitor Upgrade	$ 4,650.00	$ -
Spartan II FPGA Development Boards	$ 1,525.00	$ 1,525.00
E&CE Digital Lab Upgrade	$ 10,000.00	$ 9,000.00
		$ 10,825.00
Mechanical		
High Resolution Image Analysis System	$ 11,500.00	$ 9,000.00
Workstation Upgrade	$ 2,700.00	$ 1,500.00
		$ 10,500.00
Systems Design		
Undergrad Lab Network Switch	$ 5,146.00	$ -
Project Power Supplies	$ 2,400.00	$ 2,400.00
FPSLIC Development Systems	$ 1,500.00	$ 1,500.00
Multimedia/Alternate Platform Computer	$ 6,000.00	$ 4,300.00
		$ 8,200.00
Misc		
First Milling Machine for Student Shop	$ 5,000.00	$ 5,000.00
Wireless Network for Eng Computing	$ 12,600.00	$ 5,400.00
		$ 10,400.00
Sub-Total Department	**$ 68,521.00**	**$ 45,125.00**
Student Groups		
Iron Warrior Publishing Software	$ 668.10	$ 600.00
UW Electronics Club (UWEC)	$ 3,301.32	$ 1,500.00
Midnight Sun VI	$ 7,000.00	$ 3,500.00
UW Formula SAE	$ 7,900.00	$ 4,500.00
UWAFT	$ 3,274.90	$ 1,300.00
Wombat (2002 Minibaja Team)	$ 5,015.00	$ 2,700.00
Clean Snowmobile	$ 7,000.00	$ 2,975.00
R/C Aero Design Team	$ 970.00	$ 600.00
Robotic Soccer Team	$ 2,792.00	$ 1,200.00
GNCTR 2002	$ 1,000.00	$ 1,000.00
Sub-total Student Groups	**$ 38,921.32**	**$ 19,875.00**
Total	**$ 107,442.32**	**$ 65,000.00**

Waterloo Engineering Endowment Fund



Spring 2001 Proposals

Office Copy

WEEF Proposals - Spring 2001

	CHEMICAL AND ENVIRONMENTAL CHEMICAL	
1	Shell & Tube Heat Exchanger software	$5,200.00
	MECHANICAL	
2	High Resolution Image Analysis System	$11,500.00
3	Workstation Upgrade	$2,700.00
	ELECTRICAL AND COMPUTER	
4	Printer for Electronic Circuits Course	$300.00
5	E&CE Computer Rooms Monitor Upgrade	$4,650.00
6	Spartan II FPGA Development Boards	$1,525.00
7	E&CE Digital Lab Upgrade	$10,000.00
	SYSTEMS DESIGN	
8	Undergrad Lab Network Switch	$5,146.00
9	Project Power Supplies	$2,400.00
10	FPSLIC Development Systems	$1,500.00
11	Multimedia/Alternate Platform Computer	$6,000.00
	MISC	
12	First Milling Machine for Student Shop	$5,000.00
13	Wireless Network for Eng. Computing	$12,600.00
	Sub-Total Departmental	**$68,521.00**
	STUDENT	
14	Iron Warrior Publishing Software	$668.10
15	UW Electronics Club (UWEC)	$3,301.32
16	Midnight Sun VI	$7,000.00
17	UW Formula SAE	$7,900.00
18	UWAFT	$3,274.90
19	Wombat (2002 Minibaja Team)	$5,015.00
20	Clean Snowmobile	$7,000.00
21	R/C Aero Design Team	$970.00
22	Robotic Soccer Team	$2,792.00
	Sub-Total Student Groups	**$37,921.32**
	TOTAL	**$106,442.32**

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1. Software and Data Logging Accessory for Shell and Tube Heat Exchanger

Submitted By:

Name: Siva Ganeshalingam
E-mail: sganesh@engmail.uwaterloo.ca
Phone Number: 6161
Position: Senior Technician

Description of Proposal:

- Most process operations that are carried out by Chemical Engineers involve the **production or absorption of energy** in the form of heat. These heat transfer operations are achieved by the use of Heat Exchangers. **Shell and Tube Heat Exchangers** are the ones most commonly used in Food and Chemical Industries.
- Our department recently acquired a Shell and Tube Heat Exchanger. To make the optimum use of this equipment and to get **reliable and accurate data**, we need to purchase the **Software and Data Logging accessory** specifically developed to be used with this equipment.

Proposal Benefits:

The main features of the Data Acquisition System include:

(1) Real time **graphical displays** of
   - Hot and cold fluid temperatures
   - Hot and cold fluid flow rates.

(2) A wide range of **sampling frequencies** and durations
(3) Sensors can be calibrated and the **calibration constants stored** in the computer.
(4) The software provides details on the theory behind the experimental investigations and therefore it may be used as a **teaching aid** by the Professor teaching the Heat Transfer course.
(5) Potential use in **ChE 101, EnvE 101, ChE 025 ChE 040** and **campus day** demonstrations.

Cost Breakdown:

HT30X-303 IFD Educational Software with Data Logger (The package comprises the hardware and appropriate software for the heat exchanger)

Cost: $5200

Implementation Schedule:

As soon as possible

Additional Information:

-- Computer, monitor etc will be provided by the department.

2. High Resolution Image Analysis System

Submitted By:

Name: M. Kaptein, Mechanical Engineering
E-mail: rkap@mecheng1.uwaterloo.ca
Phone Number:
Position: Lab Director, Mechanical Engineering

Description of Proposal:

Obtaining metallographic images from polished samples is a technique that is first introduced to the students in ME 215 and ME 230. All students enrolled in 400 and 500 level materials courses use these techniques to complete their lab projects. With the recent purchase of image analysis equipment (purchased with the help of WEEF funds), we have the ability to capture and store these images electronically and obtain quantitative measurements from them.

The image analysis system, which consists of an optical microscope, video camera, computer and image analysis software (i.e. IMAGE PRO) represents state-of-the-art metallographic analysis equipment identical to that used in industry. Therefore it is a valuable training tool. Over the two years in which it has been available it has enjoyed increasing use by professors in their courses and consequently by the students. It has reached the point where the single system is heavily used and represents a bottleneck in the ability for students to complete their projects on time

Our current analog camera limits the resolution of the electronic image. This limits the accuracy of our image analysis capabilities and means that photographs are still required in some cases to obtain a high quality printed image for project reports. The inclusion of a high resolution digital camera as part of our second system and upgrade of the analog camera on our current system, would allow the students to take full advantage of our new image analysis system and directly print the electronic image, avoiding the use of expensive photographic film.

Proposal Benefits:

All undergraduate students in ME 215, ME 230, ME 435, ME 531, ME 535 and ME 544 will benefit from this upgrade.

Cost Breakdown of Proposal:

Microscope $11,500.00
Digital Camera $ 6,000.00 ⇒ $17,500

Note: WEEF has made contributions to this project during previous terms. The Department has also contributed, and a camera, software and a computer have been purchased.

Implementation Schedule

Fall 2001

3. Workstation Upgrade

Submitted By:

Name: M. Kaptein, Mechanical Engineering
E-mail: rkap@mecheng1.uwaterloo.ca
Phone Number:
Position: Lab Director, Mechanical Engineering

Description of Proposal:

Mechanical Engineering has created in Room 1101, E3, a design studio for upper level years and special projects. With assistance from General Motors the design studio's computer capacity will be increased with 13 Sun workstations.

In addition the Department of Mechanical Engineering has purchased a user license to "Unigraphics." This design package is widely used by General Motors and will be introduced to 3rd year students this fall. In order for the existing PC workstations to run "Unigraphics" efficiently we need to upgrade the CPU's and the memory capacity of some computers.

Proposal Benefits:

All 3rd year students and 4th year students involved in design projects and course requirements.

Cost Breakdown of Proposal:

Upgrade of 12 PC Workstations, memory and CPU	$2,700.00	Department Matching if necessary

Implementation Schedule

Fall 2001

↳ ME 559

4. E&CE'30'Series 'Projects in Semiconductors and Electronic Circuits'

Submitted By:

Your Name: Paul Hayes
E-mail: phayes@ece.uwaterloo.ca
Phone Number: ext. 3969
Position: Lab. Staff

Description of Proposal:

One HP Deskjet 930C Printer (to use with the Agilent 54621 Scope) $ 300

Proposal Benefits:

These unit will be used for 4th year projects in electronic circuits.

Total Cost :

$ 300

Implementation Schedule:

Winter 2001.

Additional Information:

Contact Paul Hayes EXT 3969 , E-mail phayes@ece

5. E&CE Computer Rooms Monitor Upgrade

Submitted By:

Name: Eric Praetzel
E-mail: praetzel@ece.uwaterloo.ca
Phone Number: ext. 5249
Position: Lab. Staff

Description of Proposal:

The E&CE Dept. would like to upgrade 5 to 15 of the 2½ year old monitors in the E2-2360, E2-2362 public computer rooms.

The department has already upgraded 5 of these monitors. The other 15 stations have Goldstar 17" monitors that were purchased in Winter 1999. These monitors are unable to keep a sharp focus.

I propose to purchase more of the TTX 17" monitors that we have had excellent success with [close to 100 of them from 1 to 3 years old are in various labs].
The Goldstar monitors will be used to replace the five-year old 15" monitors which are in our CPH-3371 laboratory [E&CE 48x "control" courses].
Then the 15" monitors would be used to replace 14" monitors that are used by portable computers in E&CE labs [E&CE 23x, 33x, 43x, motors and 380 labs].

Proposal Benefits:

E&CE public computer room monitor upgrade – open to all students with Polaris accounts.
E&CE 48x lab (CPH-3371) upgraded from 15" to 17" monitors
E&CE computers on carts [various E&CE courses] upgrade from 14" to 15" monitors

Cost Breakdown:

$310 per monitor
$1550 for 5, $3100 for 10, $4650 for 15 monitors

Implementation Schedule:

Fall 2001

Additional Information:

Priority:

Medium (not necessary, convenience upgrade)

6. Spartan II FPGA Development Boards

Submitted By:

Name: Eric Praetzel
E-mail: praetzel@ece.uwaterloo.ca
Phone Number: ext. 5249
Position: Lab. Staff

Description of Proposal:

This proposal concerns a small number of re-programmable FPGA's for use and development in E&CE 427 and E&CE 492.

Our new Spartan XL FPGAs (purchased Winter 2001 with WEEF funds) are excellent for our E&CE 223 course but not powerful enough for E&CE 427 and some E&CE 492 projects.

These Spartan II FPGAs use free software (Xilinx Webpack). At 200,000 gates they are 20x larger than the current Spartan XL boards. These boards are readily available for students purchase (http://www.digilent.cc) and affordable at $104 US each.

In the pricing I have included a special I/O board which includes a LCD display, more buttons, switches and LEDs).

This proposal is for a few units for development and trial use. In order to use this for a course like E&CE 427 we would have to purchase > 10 units. Currently only students in E&CE 492 as well as select E&CE 427 students who are willing to venture into the unknown will be allowed to try this new FPGA board.

Proposal Benefits:

E&CE 492 - 4th year projects
E&CE 427

Cost Breakdown:

$305 each
$610 for 2, $1525 for 5

Implementation Schedule:

Fall 2001

Additional Information:

Priority:

Medium (not necessary, trial and development use)

7. E&CE Digital Lab Computer Upgrade

Submitted By:

Name: Eric Praetzel
E-mail: praetzel@ece.uwaterloo.ca
Phone Number: ext. 5249
Position: Lab. Staff

Description of Proposal:

Starting in Winter 2002 the new E&CE 324 lab [E&CE and Mechatronics students] will be moving to new software on Windows 2000. The computers in the laboratory (Pentium 200MMX, K6-2/333 MHz) are not capable of running this software or operating system.

This proposal is for funds which will be used to replace these computers before Winter 2002. I expect that we will apply for more funds, for this upgrade, in Fall 2001.

Any computers made available by this upgrade will be used to replace older computers an become available for use by 4th year project groups (E&CE 492).

Proposal Benefits:

E&CE 324	Winter term: 180 E&CE, 45 Mech. students
	Spring term: 80 E&CE students
E&CE 223	Fall term: 180 E&CE students

Cost Breakdown:

$1000 per Celeron 733 MHz computer with 128M, CDROM, 20G HD
2 units ($2000) up-to 10 units [$10,000]

Implementation Schedule:

Late December 2001

Additional Information:

The room currently has 24 computers. For ease of install and uniformity the E&CE Department aims to keep all computers in a lab identical. Since these computers are not needed yet the purchase and installation will be delayed as long as possible. Ie late December 2001 / early Jan. 2002.

Priority:

Medium (not needed, helpful)

Necessary Eventually

8. Systems Design Undergrad Lab Network Switch

Submitted By:

Name: James Morrison
E-mail: jm2morri@thinair.uwaterloo.ca
Phone Number: X5218
Position: Lab Instructor

Description of Proposal:

This proposal is for a Cisco 48-port 100Mbs network switch to be located in the Systems Design Undergrad Lab area.

This proposal was planned to be presented in Spring 2001. However, due to a connectivity crunch experienced in the Undergrad Lab area, this switch had to be purchased before WEEF funding became available. This proposal is for retroactive funding.

Proposal Benefits:

The Systems Design Undergrad Lab area is approaching its maximum connectivity With more and more computing facilities available, we would like to provide each node with network connectivity. This is not only a convenience to our students, but also enhances the functionality of many of those computer resources.

Also, there are typically a few 4th year workshop projects that require network connectivity. We are approaching a state where we would no longer be able to grant these requests and thus inhibit out students ambitions. This proposal would alleviate this concern for the foreseeable future.

Cost Breakdown:

Description	Part Number	Qty	Unit Cost	Extended Cost
Catalyst 48-port 100Mbs Switch	Cisco WS-C3548-XL-EN	1	$5146	$5146
Total				$5146

Systems Design is looking for 50% funding for this proposal. The department has agreed to match funds.

Implementation Schedule:

Yesterday.

9. Systems Design Project Power Supplies

Submitted By:

Name: James Morrison
E-mail: jm2morri@thinair.uwaterloo.ca
Phone Number: X5218
Position: Lab Instructor

Description of Proposal:

This proposal is for 6 (six) 30W Variable Voltage Single Output DC Power Supplies. We currently have an inventory of approximately 10 equivalent power supplies but this is not enough to handle the demand created by 4th year projects.

These power supplies are capable of powering small electronic circuits and are small enough to be somewhat portable. This is important since many students choose to work on these circuits elsewhere and sign out the power supply for external use of the course of the term.

Proposal Benefits:

Implementation of this proposal will benefit all Systems Design students during the course of their 4th year projects. Of course this equipment is available for use by all other Systems Design students as well. It would even be available for short periods of time to student groups (Midnight Sun, WARG, ...) if needed and available (i.e. not signed out by Systems Design students).

Cost Breakdown:

Description	Part Number	Quantity	Unit Cost	Extended Cost
30W DC Power Supply	HP E3610A	6	$400	$2400
Total				$2400

Systems Design is looking for 100% funding for this proposal. The department has agreed to match funds if necessary.

Implementation Schedule:

Immediate.

10. Systems Design FPSLIC Development Systems

Submitted By:

Name: James Morrison
E-mail: jm2morri@thinair.uwaterloo.ca
Phone Number: X5218
Position: Lab Instructor

Description of Proposal:

This proposal is for 2 Atmel FPSLIC development systems for use in the Systems Design department. These development systems would be used primarily for workshop projects.

Proposal Benefits:

This proposal would provide the Systems Design students with some state of the art technology to be incorporated into future workshop projects. This development board is based on the Atmel FPSLIC chip. It is a combination of 8-bit RISC processor and 40,000 gate FPGA in one chip.

This is the first time that this type of integration has been available. This organisation of hardware resources opens whole new areas of design possibilities. The main benefit is the ability to have the software change the configuration of hardware in real time.

This flexibility will open new doors of possibilities for workshop projects in our department.

Also, if we agree to purchase 2 units, we have a good chance at obtaining more boards for free.

Cost Breakdown:

Description	Part Number	Quantity	Unit Cost	Extended Cost
Atmel 10K40 FPSLIC Development Board		2	$750	$1500
Total				$1500

Systems Design is looking for 50% funding for this proposal. The department has agreed to match funds.

Implementation Schedule:

Immediate.

11. Systems Design Multimedia/Alternate Platform Computer

Submitted By:

Name: James Morrison
E-mail: jm2morri@thinair.uwaterloo.ca
Phone Number: X5218
Position: Lab Instructor

Description of Proposal:

This proposal is for an Dual PowerPC G4 Tower from Apple with monitor. This computer systems would be located in the Systems Design Multimedia Lab.

This computer would significantly enhance the resources available Systems Design students in the Systems Design Multimedia Lab. Apple is the platform of choice for multimedia applications and this computer will simplify multimedia processing.

With the proliferation of Microsoft/Intel computers on campus students, this proposal would also give exposure and access to an alternate platform with consumer appeal.

Proposal Benefits:

Implementation of this proposal will benefit all Systems Design students. This machine would be available on a 24/7 basis (with key signout). It will provide our students with a greater variety of computer skills and experience.

Cost Breakdown:

Description	Part Number	Quantity	Unit Cost	Extended Cost
Dual 533MHz PowerPC G4 Compuer		1	$6000	$6000
Total				$6000

Systems Design is looking for 50% funding for this proposal. The department has agreed to match funds.

Implementation Schedule:

Immediate.

50% of what

12. FIRST MILLING MACHINE

Submitted by:

Name: Clarence Wallace , David Craig
E-Mail:
Phone Number: X 2301
Position: Supervisor, Engineering Student Shop

Description of Proposal:

The Student Machine Shop provides essential hands-on experience for all undergraduate students either for core class courses or special projects. In order to facilitate the ever-increasing number of students it is essential that we upgrade some of our machines. It would be a great asset to the shop to have an additional new milling machine.

Benefits of Proposal:

Students from all engineering disciplines will benefit from a better- equipped student shop. More courses are requiring hands-on projects - making it essential to have better and safer equipment available. The number of students using the shop has increased quite dramatically over the past two years and this underlines the need to continually upgrade wherever possible. A new milling machine would also promote safety, efficiency and provide better quality work.

Cost Breakdown:

First Milling Machine – Model: #LC-1 US – Variable Speed Head
Heindenhain 2-Axis Digital Readout System: Model: #ND 710 and Accessories

	$10,160.00
GST	711.20
PST	812.80
Total	**$11,684.00**

WEEF funding committed for Winter 20001 Term	$4,000.00
WEEF funding requested for Summer 2001 Term	$5,000.00
Engineering Machine Shop (funds and sale of old Bridgeport Mill)	$2,684.00

Implementation Schedule:

Summer 2001.

13. Wireless Network, Pilot Project – Three access points, 30 network cards

Submitted By:

Name: Paul McKone
E-mail: pdmckone@engmail.uwaterloo.ca
Phone Number: 888-4567 ext 2757
Position: Systems Manager, Engineering Computing

Description of Proposal:

Wireless networking – special cards in student-owned laptops communicating with strategically-located access points – has the potential to extend the network beyond labs and classrooms, and put it into the hands of the students, wherever they happen to be.

Engineering Computing is hoping to address this future of computing with a pilot network of three access points to provide coverage in:

- Second Floor CPH (GAFF, EngComp offices, and environs): to enable us to learn, configure, and discover the best ways to provide secure and simple access;
- CPH Lobby (including C&D, POETS, and area): to put network access into students' favourite spare-time area;
- RCH first floor (Engineer Lecture Hall, lower lounge): a combination of central lounge and surrounding classrooms.

Connectivity would be provided by 30 PCM-CIA wireless-network cards, signed-out for short-term loan, perhaps from the EngSoc office or the Engineering Computer User Support Centre. As well, users could purchase and register their own card, and be part of the same setup.

Proposal Benefits:

As enrolment increases, computing lab space becomes tighter. Wireless technology could ease this space crunch by enabling students with laptop computers to create their own "portable" lab space within Engineering.

Cost Breakdown:

2
10

Equipment	Cost (each)	EngComp portion	WEEF proposal	Project Total
Access points	$1,200	1	2	3
Network Cards	$300	4	26	30
	Total Cost:	**$2,400**	**$10,200**	**$12,600**

Engineering Computing is prepared to cover the cost of its own access point, and four network cards, approximately 20% of the total project cost. We are asking WEEF to supply the remaining funds, or an amount that represents the number of access points and network cards they feel appropriate.

Implementation Schedule:

We hope to be able to begin a preliminary launch in September of this year, with a full launch early in 2002.

Additional Information:

The Faculty of Mathematics is also investigating wireless strategies. We plan to work in conjunction with them to establish common standards and approaches, effectively doubling our service area.

Contact Information for Funding if different than above:
Name: Hector Budman
E-mail: hbudman@engmail.uwaterloo.ca
Phone Number: 888-4567 ext 4601
Position: Associate Dean for Computing in Engineering

14. Publishing Software for Iron Warrior

Submitted By:

Name: Ryan Bayne
E-mail: rmbayne@engmail.uwaterloo.ca
Phone Number: (519)888-4567x2693
Position: Technical Editor

Description of Proposal:

The Iron Warrior would like to purchase new software for assistance in designing the newspaper. Specifically, the Iron Warrior requests an upgrade of QuarkXPress for Macintosh from version 3.31 to version 4.1, along with a new copy of Adobe Acrobat 5.0.

Proposal Benefits:

Currently the Iron Warrior does its newspaper layout in QuarkXPress 3.31. While it is capable of producing the newspaper, it is only due to the cautious use by those performing layout duties. As the current copy of QuarkXPress 3.31 was purchased along with the Power Macintosh 7200 in 1996, the software is currently five years old. With the purchase of the Power Macintosh G4, and with it Mac OS 9.1, incompatibilities have been discovered. The primary problem is that using the scroll bars to navigate through the document results in the entire computer crashing, slowing down production. In addition to fixing bugs due to incompatibilities between QuarkXPress and the operating system, a number of new features are included with QuarkXPress 4.1. The version owned by the Iron Warrior is only capable of importing Microsoft Word 4.0 documents, which dates back to pre-Windows 95. The upgrade would be able to import current Microsoft Word documents, which would remove a step from importing submissions sent in Microsoft Word 97 format. The upgrade would also allow a wider variety of design options that are currently not available. Text can now flow around oddly shaped objects, which would result in a more dynamic appearance and hopefully increase readership of the newspaper.

Adobe Acrobat fills a role that currently relies on the personal computing resources of Iron Warrior staff, who are not available every term, and will eventually graduate. Currently Adobe Acrobat is used for two purposes: converting output from applications such as Microsoft Excel into a usable format for inclusion in the newspaper, and converting advertisements sent in Adobe Acrobat format. Frequently the Iron Warrior is requested to include items such as Microsoft Excel charts or tables. However, these do not easily import into QuarkXPress. Therefore, they must be converted to an image before being placed in the newspaper. However, without Adobe Acrobat, the image tends to be of a lower quality, resulting in jagged text or lines. As indicated in Figures 1 and 2, there is an improvement provided by using Adobe Acrobat as part of the conversion process.

Positions Available

Exec	#	Directorship
Prez	1	Director Catalogue
	1	Orifice Director
	2	Poets Programmer
VP-X	1	Charities
	2	Competitions & Student Groups
	1	Diversity
	2	Interfaculty Relations
	1	Women in Engineering
VP-E	1	Scholarships
	1	SFF Rep
	3	Student Workshops
VP-I	1	Arts
	2	Athletics
TBD	1	Drama - Director
TBD	1	Drama - Asst Director
TBD	1	Drama - Producer
	2	EngWeek
	2	Enginuity
	1	Frosh Mentoring Advisor
	2	P**5
	2	Task Team
	2	TSN - EOT video
	1	Webmaster
new	1	Faculty Liaison

TBD To Be Determined

Figure 1: Table as printed in Iron Warrior Vol 23, Issue 6 without Adobe Acrobat

Positions Available

Exec	#	Directorship
Prez	1	Director Catalogue
	1	Orifice Director
	2	Poets Programmer
VP-X	1	Charities
	2	Competitions & Student Groups
	1	Diversity
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	1	Women in Engineering
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	2	Enginuity
	1	Frosh Mentoring Advisor
	2	P**5
	2	Task Team
	2	TSN - EOT video
	1	Webmaster
new	1	Faculty Liaison

TBD To Be Determined

Figure 2: Table converted with Adobe Acrobat

In addition to the improvement of quality, a number of advertisers have taken to sending their ads in Adobe Acrobat format. This is a competitive advantage over Imprint, which cannot currently accept ads in electronic form. However, using these ads in the paper require a combination of Adobe Acrobat and Adobe Photoshop, of which the Iron Warrior only owns the latter. Without the resources of individual staff, the Iron Warrior will no longer be able to accept advertising in this form, reducing their opportunities. For an example of the quality ads sent in Adobe Acrobat format are capable of, see the Imperial Oil ad on the back page of The Iron Warrior, Volume 23, Issue 8. The advertiser was able to e-mail their advertisement in Adobe Acrobat format to the Iron Warrior within minutes, whereas other attempts by the same advertiser took over two hours and failed.

With the purchase of Adobe Acrobat, the Iron Warrior will also be able to compliment its web edition with the ability to produce exact electronic replicas of the newspaper, including ads, and provide them for archiving and distribution to interested parties. Since the Adobe Acrobat Reader is free, anybody would be able to read this digital format for the newspaper, whereas few people can read the QuarkXPress format which is not worth distributing widely.

Cost Breakdown:

QuarkXPress:	
4.1 Mac OS Upgrade	$306.15 US
Tax	$23.53 US
Shipping	$30.00 US
TOTAL:	$359.68 US
TOTAL ($CAN)	**$549.30 CAN** (Exchange Rate as of 2001/06/22 $1 US = $1.52718 CAN)
Adobe Acrobat:	
Version 5.0 MAC	$109.99 CAN
PST	$8.80 CAN
TOTAL:	**$118.79 CAN**
Proposal Total:	**$668.09 CAN**

Implementation Schedule:

As soon as possible. The user interface for QuarkXPress 4.1 is not significantly changed from the current version; therefore, little retraining is required

15. University of Waterloo Electronics Club (UWEC)

Submitted By:

Name: John Sollazzo
E-mail: jnsollaz@engmail.uwaterloo.ca
Phone Number: (519) 725-0959 (home)

Description of Group:

The University of Waterloo Electronics Club (UWEC), in association with the local chapter of the IEEE is a club with an electronics design project focus. Started in the fall of 1999 by Arun Patel and Dylan McGuire, and supervised by Ed Spike of the E&CE department, UWEC is an undergraduate club open to all students in Engineering interested in the design and development of functional electronics projects. As part of the club mandate, project description and kits are supplied to introduce beginners to the concepts of practical electronics. Moreover, UWEC fosters an environment within which advanced students can launch their own electronic endeavours.

Current Accomplishments:

- Made parts kits available to members
- Developed a basic project portfolio.
- Acquired lab-space in association with the IEEE.
- Began development of the embedded system design project including the acquisition of an Atmel ARM microprocessor development board.
- Initial software prototyping stage is complete.
- Currently pursuing official club status with the Federation of Students.

Description of Proposal:

Having completed an introductory first-year project, a microprocessor-based alarm clock, UWEC is aiming to take on a more complex project while building a solid student membership. To cater to experience levels ranging from beginner to advanced, the club proposes a branched approach to projects, involving newcomers in some basic logic and microprocessor designs, while more experienced members gear up to tackle an embedded-system design.

Often students find it difficult to gain relevant design experience early in their academic careers. It is our desire to support junior students in their efforts to gain knowledge and experience in hardware design. As well as providing exceptional educational opportunities, the Electronics Club aims to give back to the faculty of Engineering. For instance, the club has been asked to design and create various projects for Mr. Spike.

Mindful that fourth-year projects are compulsory in the department of Electrical and Computer Engineering, UWEC will provide the opportunity for students to develop the skills required for this undertaking. Funding from WEEF last term was used to purchase project kits and an Atmel ARM microprocessor development board. UWEC is also pursuing support from the IEEE and the ECE department in the form of cash and equipment, as well as sponsorship from Motorola. We would like to

thank the Waterloo Engineering Endowment Fund for their support and request their continued assistance in this endeavour.

Description of Current Project:

The current project entails designing and constructing a digital media player In order to do this, an embedded microcontroller and digital signal processor are required. It is also necessary to have laboratory and test equipment in order to be able to use the hardware correctly and ensure that all components interface correctly.

Cost Breakdown:

ITEMS:	Price	Qty.	Total
Components:			
Motorola DSP56309 Evaluation Board	420	1	420.00
Parts Kits (Breadboards; wires; IC's; etc)	50	6	300.00
Fluke Digital Multimeters (Handheld)	170	2	340.00
Weller WTCPT Soldering Station	186	2	372.00
Test Equipment:			
Agilent 6612C 40W DC Power Supply, 20 V, 2A	1,465	1	1465.00
Oscilloscope Probe (BNC)	180	2	360.00
Leads (Banana to Minigrabber - Bk, R, G, Y)	5.54	8	44.32
100MHz Oscilloscope	Donation (ECE Dept.)	1	0
Signal Generator	Donation (ECE Dept.)	1	0
Digital Multi-Meter	Donation (ECE Dept.)	1	0
Total:			**$3301.32**

WEEF

½ WEEF

Current Size: 8

Funding Options

Option A:
Complete funding:
$3301.32

Option B:
Full funding of components, partial funding of test equipment (i.e. IEEE may be willing to match 3x the WEEF donation for equipment that remains in the IEEE lab.)
$1900.00

16. Midnight Sun VI Solar Car Project

Submitted By:

Name: Connie Kwan
E-mail: cmkwan@uwaterloo.ca
Phone Number: (519) 888 - 4567 x 2978
Position: Business Manager

Description of Proposal:

The Midnight Sun Solar Car Project strives to design and construct an efficient solar car. Every term, about 50 University of Waterloo students, primarily engineers, spend numerous hours working on our project. Midnight Sun VI qualified 12th in Topeka, Kansas and is the only Canadian Team to show up with a working solar car! Midnight Sun VI will be racing in American Solar Challenge and World Solar Challenge in Australia. Building on solid engineering practices, the latest in computer aided engineering, a wealth of past experience, and an influx of new ideas, the team is poised for the new challenge ahead. With the results demonstrated by the new car at the qualifier, the team is confident in bringing home another top 10 finish. However, success does come with a price. In our current situation we need more funds to complete our telemetry system, which is a vital component for strategy. We also need to expand our pack for World Solar Challenge. Thus we approach WEEF for funding in the purchase of a telemetry laptop and extra batteries.

Telemetry Laptop

The telemetry system needs a laptop to log data from the solar car. Currently, the WEEF laptop from Systems Design is borrowed every time the car is taken on a test drive. However, professors often book the WEEF laptop for presentation uses. In addition, Midnight Sun often needs the laptop for extended periods and as such will conflict with other users of the laptop. Another advantage for owning the telemetry laptop is the convenience of keeping telemetry data on the laptop. When we borrow the WEEF laptop, we have to download the data onto our home computers after every trip and upload them again onto the laptop before every trip. This is time inefficient. WEEF has already funded much of the telemetry system in the solar car. Funding for this laptop will complete the package.

Batteries

The regulation battery weight for World Solar Challenge (WSC) is 36kg as opposed to 30kg for American Solar Challenge (ASC). Thus, to improve our competitiveness, the current battery pack should be expanded.

Proposal Benefits:

Students from many faculties are involved in designing and building subsystems for Midnight Sun. Over 50 students have committed their time in construction of the vehicle and more students have helped out with events and sponsorship. The majority of team members are in Engineering. Many students make research for the car's subsystems a student project and learn much from the experience. We already have 5 mechanical projects for the ME481 course done by team members in that course. We also have an electrical research on MPPTs that is used to fulfill a course requirement. The investment by WEEF in the Midnight Sun VI project will make Waterloo a stronger competitor the 2001 races. Since Midnight Sun represents the University of Waterloo Engineering, a successful team gives Waterloo greater exposure.

The team routinely displays the car at shows such as the Canadian International Auto Show (CIAS). Molson Indy, High Tech Show and participates in local festivals such as Earth Day, Canada Day and the Oktoberfest parade. We also partake in Engineering Science Quest.

Goals of Midnight Sun VI:

- To design and construct an efficient solar car for ASC 2001 and WSC 2001
- To develop an interdisciplinary engineering project that promotes education through applied engineering experiences
- To represent Waterloo Engineering through exposure of the project at races, trade shows, and media events
- To further alternative fuel technologies through research and development efforts

Cost Breakdown:

Approximate costs outlined. Exact costs will be discussed at presentation. Partial funding is appreciated as well.

	Item	Quantity	Amount
Plan A			
	Telemetry Laptop	1	$3000
	6kg Li-ion Battery Pack	1	$4000
		Total:	**$7000**
Plan B			
	Telemetry Laptop	1	$3000
	Half of a 6kg Li-ion Battery Pack	1	$2000
		Total:	**$5000**
Plan C			
	Half funding for Telemetry Laptop	1	$1500
	Half of a 6kg Li-ion Battery Pack	1	$2000
		Total:	**$3500**

Implementation Schedule:

Items being requested will be purchased immediately upon the availability of funds. The laptop is crucial during out testing phase of the solar car and will be very useful for our race in July. Battery pack expansion is time consuming since the pack arrives as individual modules that require assembly into a pack.

Additional Information:

Midnight Sun would like to thank WEEF for its on going support of Midnight Sun. As a result of contributions made by WEEF to Midnight Sun, WEEF has funded all of the data acquisition system and is currently a **Silver Sponsor**.

17. Team Advancement of the UW Formula SAE Team

Submitted By:

Name: Rafal Smerd
E-mail: fsae@engmail.uwaterloo.ca
Phone Number: x5904
Position: Formula SAE Team 2002 Team Leader

2002 Formula SAE

- 30 Undergrad Engineering Students
- Largest Mechanical Engineering Student Project
- Many Disciplines Participate E + CE
- Both streams
- First to fourth year

WEEF

Formula SAE support is an excellent public/corporate awareness tool available to WEEF. We are a consistent Top 10 finishing team, competing with over 125 other teams from around the world. Several large automotive (and related) companies sponsor the event.

Description of Proposal:

To purchase the following equipment in order to further progress the development of the 2002 Formula SAE car and cars to be developed by all future teams.

Option 1:

Items
Engine
Dampers
Tools
External CD-Reader/Writer
Literature
Banners

Option 2:

Items
Engine
External CD-Reader/Writer

Proposal Benefits:

Option 1:

Engine: The engine is an essential part of the car that takes a great deal of time to tune. Extensive dyno testing is conducted in tuning the engine. The engine will be used as the 2002 race engine. The purchase of the engine will benefit the team in allowing both the 2000 and 2001 cars to remain operational for track testing throughout the fall, and allow us to conduct dyno testing earlier than in previous years. This will increase the reliability of the engine during testing and the competition. Engine tuning philosophies change from year to year, and future teams will benefit from the purchase of the engine in relating it's characteristics to track performance.

Dampers: Adjustable dampers are proposed for the 2002 car. The 2002 team is planning on conducting extensive damper testing and development. The purchase of these dampers will benefit the 2002 team, providing more time for characterization and testing of them. These results will benefit both the 2002 team and future teams in damper tuning. Dampers have a service life of 2-3 years depending on wear and tear. and can be used by future teams.

External CD-Reader/Writer: Team Documentation is vital for future teams in understanding previous designs. Public Relations (investor's kits, thank-you letters, etc) and the financial aspects involved in the operation of the Formula SAE Team. Currently, documentation stored on the computer is taking up hard drive space, hard copies are taking up shelf space and others are getting lost. A CD-Reader/Writer will allow us to efficiently and cost effectively archive previous year's documentation to be used by future teams. An external unit will give us the flexibility of using it with our laptop computer.

Tools: A complete set of tools is essential for constructing a new car. Currently some of our drill bits are either missing or worn out, and we do not have ready access to items such as gear pullers on weekends.

Literature: All members on the team rely on technical literature in understanding the parameters involved in designing racecar components and components in general. New information is being released on a regular basis. Material such as the damper handbook, the Machinery's Handbook, SAE transactions, engine manuals and vehicle dynamics literature will be used by members of the current and future teams in designing the car.

Banners/Display Boards: A number of banners and display boards are used when the car is displayed at trade shows, parades and public relations events. The current banners and boards were purchased by the 2000 team, and bear the Formula SAE Team 2000 logo and text. These were modified in 2001 to bear the 2001 year, however they cannot be modified for 2002 and still look professional. It has been proposed to update the banners/display boards to read "University of Waterloo Motorsports – Formula SAE Team". These banners could then be used by future teams without to sacrifice a professional appearance by having to modify them

Option 1:

Item	*Cost*
Engine	$5000
Dampers	$900
External CD-Reader/Writer	$500
Tools	$500
Literature	$500
Banners	$500
TOTAL	$7900

Option 2:

Item	*Cost*
Engine	$5000
External CD-Reader/Writer	$500
TOTAL	$5500

Implementation Schedule:

The items listed above would be purchased as soon as possible. Each item would have an immediate positive impact on the 2001 FSAE team as well as future teams.

Additional Information:

Funding priority is to the engine.

18. University of Waterloo Alternative Fuels Team (UWAFT)

Submitted By:

Name: Dan Hayhoe
E-mail: edhayhoe@engmail.uwaterloo.ca
Phone Number: (519)725-7596
Position: Team Member

Description of Proposal:

The University of Waterloo Alternative Fuels team is currently preparing to participate in the 2002 Tour de Sol competition. At this competition, the team is planning enter a hybrid electric vehicle. Since this is the first year that this vehicle will be developed, certain testing and safety equipment is required for the implementation of the high power electronics of the vehicle. This proposal consists of several separate components:

i) Current Probe – measures up to 1000 amps
ii) Power Supply
iii) Multimeter
iv) Digital Oscilloscope
v) Power Probe
vi) Sponsorship advertising

Proposal Benefits:

In order to implement a hybrid electric vehicle, many high powered electrical components will be installed on the vehicle. Many of the components to be installed require extremely high voltages and currents to operate. Therefore, in order to ensure that the equipment is installed safely and properly, the system will have to be tested thoroughly before the system is energized. Also, the requested equipment will be able to give assistance in debugging the system.

Another aspect that was considered was the flexible usage of the equipment. Other teams and departments who may require instrumentation for high-powered equipment testing can also make use of this equipment. (i.e. Midnight Sun, Formula SAE etc.) Also, this equipment will be able used by the team for many years.

Funds are also needed for costs incurred by advertising. A large amount of money can be generated for the team by requesting sponsorship from private companies, but in order to get funding, money has to be spent on printing brochures and advertising.

The UWAFT team gives students the chance to apply knowledge gained during their education at the University of Waterloo in a practical and challenging environment. Students design, test and manufacture different components while working together to build a competitive vehicle. Strong entries in the past also contribute to the reputation of the University of Waterloo a first class engineering school.

Cost Breakdown:

Description	*Cost*
i) Digital Ammeter – Amp Probe A-1000	$240
ii) 20 A Power Supply – ABRA AB-32	$259.95
iii) Multimeter – Fluke 83	$341.00
iv) Digital Oscilloscope – Agilent Technologies – 54621D: Note: This cost is 50% of the regular cost due to a limited time education discount	$1998
v) Power Probe – Fluke Volt Alert 1AC – 90-600V	$35.95
vi) Advertising Costs	$400
Total	$3274.90

Most important

Implementation Schedule:

The team is planning on starting the system integration in the fall term. Therefore, the items listed above would be purchased at the beginning of the fall term. Advertising costs have already been incurred and available funds will be used immediately for this purpose. Each item specified above would have an immediate positive impact on the 2002 UWAFT team as well as future teams.

Additional Information:

Contact Information for Funding if different than above:
Name: Prof. R.A. Fraser
E-mail: rafraser@engmail
Phone Number: x4764
Position: Faculty Advisor – UWAFT

19. 2002 WoMBAT Mini-Baja Vehicle

Submitted By:

Name: Caleb Van Sligtenhorst
E-mail: crvansli@engmail.uwaterloo.ca
Phone Number: 746-5666
Position: Team Member

Description of Proposal:

We are in the process of re-entering the mini-baja competition after a 5-year absence. Funding is needed to purchase materials and parts for the 2002 vehicle.

Proposal Benefits:

The mini-baja vehicle competition offers unique design challenges due to the strenuous terrain involved. Designing and building the car is valuable experience for the students involved, and contributes to the success of our engineering programs.

The parts and materials listed below are all required for the 2002 vehicle. Most parts from the 1997 car cannot be reused because the power train, suspension, braking, and frame design of the 2002 car are fundamentally different.

Cost Breakdown:

Option 1:	
Steering Components Includes Spindles ($200), Tie Rods ($20), King Pin Assembly ($40), Bearings ($10), Rack & Pinion ($30), Materials ($100) and Steering Wheel ($25)	$425
Drive Train Components Includes Engine Shipping ($165), CVT ($450), Sprockets ($120), Hubs ($300), Bearings ($135), Axle ($300), Chains ($90), Reduction Shafts and Mounts ($50)	$1610
Brake Components Includes Callipers ($400), 2 Master Cylinders ($140), Brake Discs ($90), Brake Pads ($50), Brake Lines ($50)	$730
Suspension Components Includes Shocks ($900), Materials and Welding ($300)	$1200
Frame Components (Material and Welding)	$300
Wheels and Tires	$750
TOTAL	$5015

Option 2:	
Steering Components	$425
Drive Train Components	$1610
Brake Components	$730
Frame Components	$300
TOTAL	$3065

Option 3:	
Steering Components	$425
Brake Components	$730
TOTAL	$1155

Implementation Schedule:

Parts will be purchased and the car assembled and tested between August 2001 and May 2002.

Additional Information:

None.

20. Clean Snowmobile Challenge (CSC2002)

Submitted By:

Name: Alex Lothian, Debbie Olsen
E-mail: aglothia@engmail.uwaterloo.ca dkolsen@engmail.uwaterloo.ca
Phone Number: 747-9509
Position: CSC team members

Description of Proposal:

The Clean Snowmobile Challenge 2002 (CSC 2002) is a competition initiated by Yellow Stone National Park and the Society of Automotive Engineers (SAE). The focus of this competition is to improve the emissions, fuel economy and reduce noise levels of a two-stroke snowmobile while maintaining or improving performance. The modified snowmobile will compete during the annual World Championship Hill Climb in Jackson Hole, Wyoming. The competition is scheduled to take place at the end of March, 2002

We would first like to thank WEEF for the support that has been given to us in the past, with the support from WEEF we have placed very well at previous competitions. At last years competition we placed first overall. For this term, we would like to propose that WEEF assist the team in the purchase of spectral analysis equipment to help pin point the sources of sound emissions from the snow mobile.

Proposal Benefits:

The Clean Snowmobile Challenge, although one of the newer engineering competitions, has provided valuable experience for a number of students while helping them complete required course material. With the current publicity of the impact of snowmobiles on the environment, more so in the US than Canada, the CSC addresses a practical engineering problem.

One of the main criteria of the competition is to reduce to the sound emissions from the snow mobile. Under full throttle acceleration, we are required to have a noise level of less than 74 dB measured at a distance of 50 ft. At last years competition we were lucky to attain 74 dB right on. With the further modifications being made to the snow mobile we can not afford to rely on luck two years in a row. The sound level meter purchased last year is adequate for measuring the sound but does not help us to pin point the actual sources. The spectral analysis equipment will allow us to properly design for sound control in the specific frequency ranges required.
The Formula SAE team, the Ethanol vehicle, can also use the spectral analysis equipment. Having a portable analyser would be greatly beneficial for field-testing but PC based analysis software may be adequate.

Cost:

We are asking WEEF for funding to cover the cost of spectral analysis equipment. Depending on which type of equipment would be most useful to all the teams the cost is expected to fall in the range of $4000 - $7000 Canadian.

Implementation Schedule:

As most of the design is taking place this term the funding is needed as soon as possible.

Additional Information:

Until recently there has been little attention given to the adverse effects that two-stroke recreational vehicles have on the environment. This has sparked research and development into the improvement of these vehicles. Industry players and off-road enthusiasts are finally starting to address the concerns of the public because of recent threats by the Clinton government to ban such activities in public parks and forests. We are one of only two Canadian teams at the competition, it is our national duty to finish well at this competition.

Contact Information for Funding if different than above:
Name: Roydon Fraser
E-mail: rafraser@engmail.uwaterloo.ca
Phone Number: x4764
Position: Faculty Advisor

21. R/C Aero Design Team

Submitted By:

Name: Ian Rainey & Steve Viola
E-mail: ianrainey@altavista.net & stephen_e_viola@yahoo.com
Phone Number: 880-1291
Position: Team Leaders

Description of Proposal:

We are preparing for the 2002 SAE Aero Design Competition, an event that attracts over 40 universities worldwide. WEEF funding would make it possible for our team to transform design plans that are under development into an actual flying prototype.

Proposal Benefits:

The R/C Aero Design Team offers a chance for undergrads interested in avionics to learn the fundamentals of flight and airplane design. Knowledge and skills are acquired through hands on construction of airplane components, flight-testing, and remote control flight.

Cost Breakdown:

Option #1

Item	Price
Battery for Controller	$ 40
Glow Plugs and Warmer	$ 60
Fiberglass	$100
Styrofoam	$100 x2
Model Plane Fuel	$ 75 x2
Epoxy	$ 60 x2
MonoKote Kit	$ 80 x2
Balsa Wood	$ 25 x2
Servo Motor Battery Pack	$ 30 x3
Total	**$ 970**

This preferred option will provide the team with the funds to rebuild the '97 competition plane and build a new prototype plane. The '97 rebuild will provide team members with an opportunity to hone their manufacturing skills before attempting to build a completely new plane.

Option #2

Item	Price
Battery for Controller	$ 40
Glow Plugs and Warmer	$ 60
Fiberglass	$100
Styrofoam	$100 x1
Model Plane Fuel	$ 75 x1
Epoxy	$ 60 x1
MonoKote Kit	$ 80 x1
Balsa Wood	$ 25 x1
Servo Motor Battery Pack	$ 30 x2
Total	**$ 600**

This option will provide the team with the ability to build a prototype competition plane, but will not allow us to make use of the '97 competition plane as learning tools.

Implementation Schedule:

Place order for materials as soon as funds become available. Construction of first prototype will begin once all necessary supplies are acquired.

Additional Information:

Please note that competition rules prohibit us from repairing and using a plane that has flown in a previous competition.

22. Robocup Vision System

Submitted By:

Name: Edward Horne
E-mail: epwhorne@engmail
Phone Number: 725 2043
Position: UW Robotic Soccer Group Member

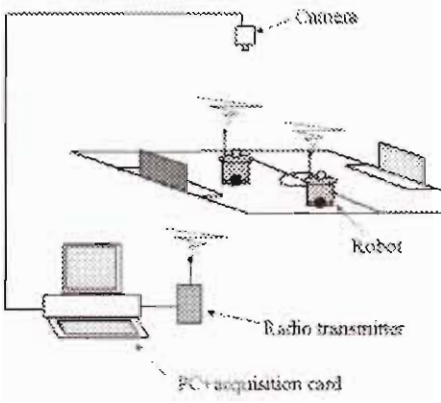
Description of Proposal:

Robocup is the robot world cup of soccer, it is an international competition where teams of autonomous intelligent robots compete in soccer matches. UW Robotic Soccer Group is developing a team of robots to compete in the F-180 small robot class. Check out www.robocup.org for more details on the competition

Vision System

An essential part of the Robocup platform is a global vision system, which locates each robot and the ball on the field. The vision system comprises of a camera placed above the playing surface shown below in the diagram. A frame grabber is required to take the pictures from the camera and put them into memory. Finally image processing and pattern recognition is done on a PC to determine the positions and directions of all ten robots and the ball on the field.

12 members



Proposal Benefits:

Robocup provides a valuable learning experience for students from electrical, computer, systems design, and mechanical engineering. Robocup is an effective research platform in artificial intelligence and mobile robotics, which can benefit professors conducting research in these areas. We are a new and enthusiastic team that will quickly become competitive at the international level with the help of purchasing this equipment.

Cost Breakdown:

Matrox frame grabber	$1192.00
JVC CCD colour video camera	$1600 00
Total	$2792.00

Implementation Schedule:

Implementation of vision system would begin immediately upon receipt.

Additional Information:

23. GNCTR 2002

Submitted By:

Name: Allister Mason
E-mail: awmason@engmail
Phone Number: 725-2637
Position: Design Team Member

Description of Proposal:

The Concrete Toboggan is the oldest (28 year) of the university competitions. Each year Waterloo sends a team of dedicated sledsters to the competition where they compete with teams from around the world. Currently our team consists of approximately 25 civil engineering students. We are asking for $1000 to help offset the cost of construction materials. The following items are to be purchased:

Formwork	Portland Cement
Aggregate	Concrete Reinforcement
Miscellaneous Material	

Proposal Benefits:

The benefits of supporting this proposal our:

1) 25 civil students are able to show off their inginuity on a large scale.
2) WEEF gets large scale exposure at an international level.
3) UW Engineering continues its tradition of excellence at competitions.

Cost Breakdown:

$1000 For all materials listed above.

Implementation Schedule:

Design is currently underway and the construction of the sled will take place during the fall term.

Additional Information:

The 2002 GNCTR team would like to thank WEEF for its previous contributions to our team that have proven invaluable.

Contact Information for Funding if different than above:

Name: John Tjeerdsma
E-mail: jptjeerd@engmail
Phone Number: 747-4066
Position: Treasurer