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INDUSTRIAL DESIGN GRADUAND EXHIBITION

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The University of New South Wales and Darling Park welcomes visitors to the Bachelor of Industrial Design final year graduand exhibition.

The industry linked Industrial Design course at the University of NSW integrates marketing, engineering, production, and business planning with industrial design to produce graduands who are capable of integrating user and design objectives with the overall commercial objectives of organisations.

The projects in this catalogue have been developed in conjunction with clients from industry and research organisations. Each graduand has undertaken a major research study reviewing the product background and current state of the art, production requirements, marketing possibilities and commercial potential.

The design study has normally included a value analysis, conceptual studies, evaluation program, product research, detail design development, production planning and business evaluation. The final design is documented with CAD engineering drawings, renderings and computer illustrations, presentation model, all accompanied by final research studies incorporating a business plan.

The students and staff of the department of Industrial Design at the University of New South Wales, wish to express their gratitude to the following sponsors. Without the support of these organisations, the staging of this exhibition and production of this catalogue would not be possible.

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PROJECT

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22 ENVIRONMENTAL CONTROL SYSTEM

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NICHOLAS SPRATT

23 FIRE HELMET

DORENE LAU

24 HOUSEHOLD GREY WATER RECYCLER

AQUATECH-MAXCON PTY LTD



TIM LEONARD

25 CYCLIST'S POWER OUTPUT DEVICE

MATT GRIFFIN

26 MUSIC - ON - DEMAND

SONY AUSTRALIA LTD



JOSEPH SGAMBELLONE

27 ELECTRIC MPV FOR THE SYDNEY OLYMPICS

ALEX LIAUW

28 MODULAR BUS SHELTER PRODUCT

BHP RESEARCH PRODUCT
APPLICATIONS LABORATORIES
PORT KEMBLA





The embodiment of technology. Integration of manufacturing and engineering. Rigorous research. Acquisition and application of market data. This is the role of the industrial designer.

For the industrial designer the goal is to create consumer products which alleviate the 'technophobia' often experienced by many consumers. The emphasis must be on the needs of the individual. The result must be products which are socially responsible and semantically 'simple' to interact with. Products which develop a relationship with the end user. Much like a favoured wrist watch. To create a 'human centred' product rather than the aesthetics of the cold black box.

Acknowledgements

Thanks to Philips CD-i for their technical support.



Main Photo: CD-i portable multimedia player

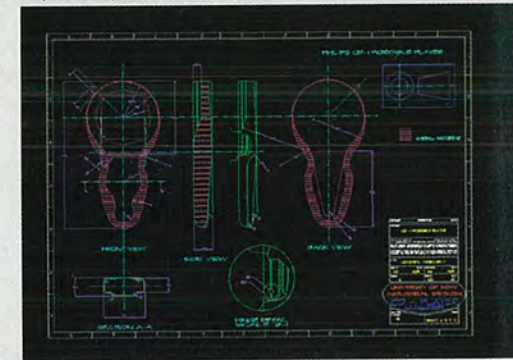


CD-i in action



Exploded parts assembly

Exploded parts assembly



CD-i Portable Multimedia Player

The typical scenario revolves around the premise of a total entertainment package. Examples range from simple audio listening as with the familiar Walkman to watching one's favourite video on CD whilst commuting. Other usage patterns include gaming, creating similar scenarios to that of Sega and Nintendo portable gameplayers. The portable CD-i player has many market opportunities and applications. A product with the functional edge and personal flexibility to excite a broad demographic range from youth markets to technological enthusiasts.

CD-i format

Based on conventional CD format, CD-i offers many options previously not available on compact disc. Interactive consumer applications and usage patterns include;

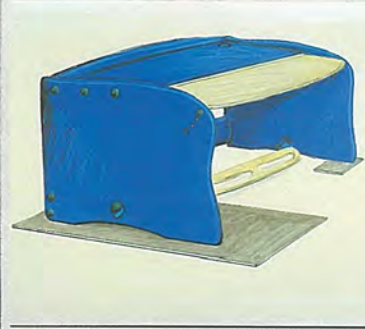
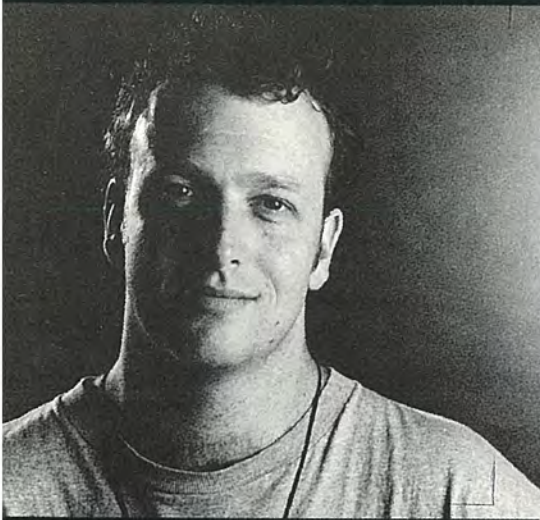
Video CD

Audio CD

Photo CD

Games

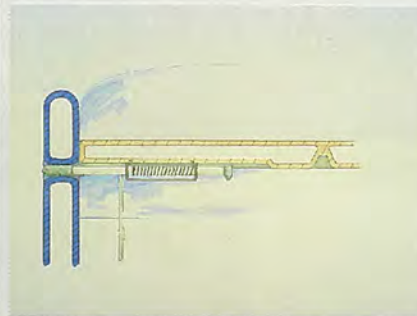
Each of the formats is compatible with any CD-i player. Conventional CD's (Audio CD) can also be played.



Above: The colour, material and use of generous curves provide a 'playful' aesthetic while maintaining the integrity needed for such a product.



Above: Product with computer and standard school chair. A range of chair sizes are often available in schools and the workstation adapts to these.



Below: Ergonomic diagram depicting smallest (5 year old) and largest (12 year old) users. PC's may have the monitor placed to the side of the terminal if frequently used by the smaller students. The top height for the keyboard bench is 640mm and the lowest is 520mm. The footrest may be set at a level of zero, 40mm and 100mm.

Above: This front sectional view shows the rotationally moulded wall cavities, and the front spring loaded mechanism which enables the height adjustment of the keyboard desk.



The impetus for this design arose from a recognition that computers are being used to a greater extent in the school system, without the support of appropriate furniture.

The problem has been acknowledged by the Parents and Citizens Association, the school authorities and in ergonomic studies. Poorly fitted furniture can result in short term fatigue and long term injuries. While this has resulted in a high level of action regarding the adult market, children have been largely ignored.

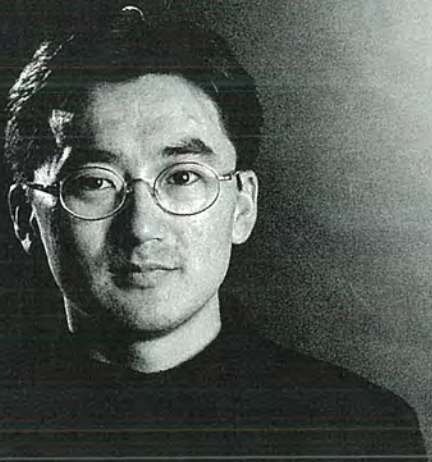
This product is designed for the infants / primary school market. The large degree of variations in physical size pose special problems for this age group. Adjustability is required but it should be easy to achieve in a minimal time yet must discourage the temptation to play with such controls once the desired position is achieved. The workstation also needs to be accessed by two students. Other crucial factors were the need for a low cost product and an aesthetic relevant to the user.

Confining the adjustable function to the keyboard bench reduced the complexity of the mechanism needed. This keeps the cost of the product down while allowing for regular and easy alterations which may be carried out by one teacher or two students. The second degree of change is created by the footrest. Rotationally moulded plastic walls create a desired aesthetic direction while supplying a lightweight, sturdy and economical product.

The best product is not merely superfluous but genuinely beneficial to people. This does not negate aesthetic beauty in favour of functionality but rather it requires the marriage of the two.

Having previously completed a B.A. at the College of Fine Arts, UNSW, I have enjoyed developing an approach to design which achieves such a duality. This essentially involves prioritising many demands in order to find the optimum balance, and hence achieve a high quality relationship between the product and user.

Acknowledgement
Rotadyne Plastics Pty Ltd.



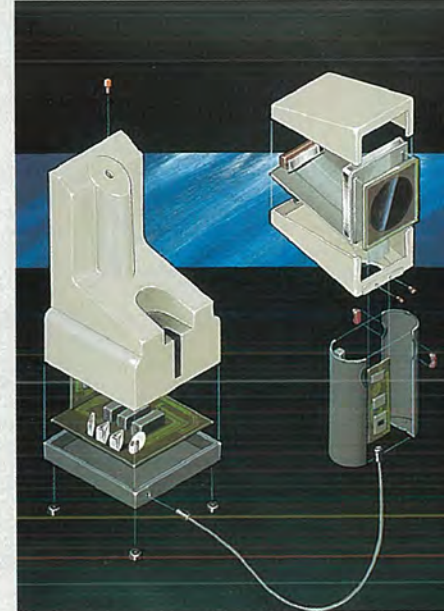
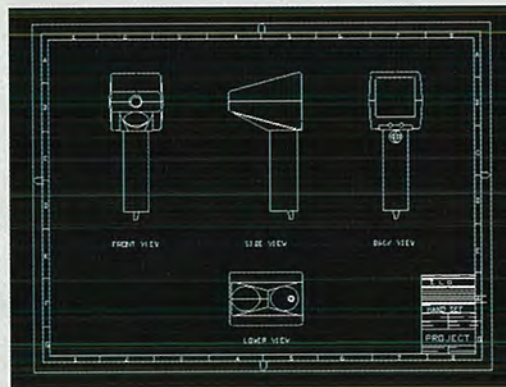
Innovation has been defined as the conception, invention, and exploitation of an idea. Every person has ideas, but it requires a disciplined and professional approach to translate those ideas into reality.

As a practicing Optometrist, I am able to see the various needs of the general public. However, there are frequent times when solutions to specific needs are envisaged but can not be realized. Here lies the motivation for studying the Bachelor of Industrial Design.

Now as a graduate of Industrial Design, I hope to use my skills to offer practical suggestions to the many needs in the community. I am looking forward to entering an exciting profession, and I enter it with the confidence that comes from the multi-disciplinary approach taught at the University of New South Wales.

Acknowledgements

Mr Robert Woolford - Rodenstock Australia.
Associate Professors David and Shelia
Crewther - School of Optometry, U.N.S.W.



The project involves the re-design of an Ophthalmoscope, which is an instrument used by many medical and health care professionals to view the external and internal features of the eye.

There are many problems associated with the use of traditional ophthalmoscopes. The most significant problem occurs when the patient's pupils are constricted, causing difficulties for the practitioner during examinations. Other problems include glare experienced by patient produced by the instrument's light source, the close proximity between the examiner and the patient, and unwanted reflections from the eyeball.

The hand-held scanning laser ophthalmoscope is much like a conventional ophthalmoscope, however a low intensity laser beam replaces the incandescent light source. Here lies the innovation for the design, as by applying this technology, all the above problems are eliminated.

Top left:
Scanning head in user's hand

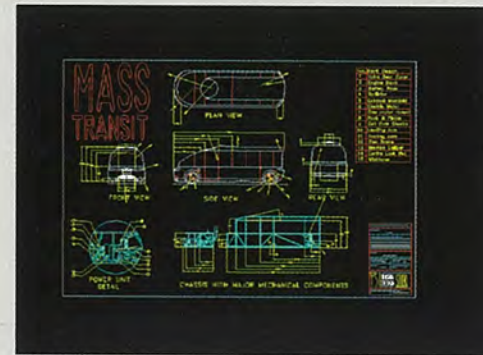
Top right:
Exploded assembly drawing

Bottom left:
AutoCad drawing

Bottom right:
Instrument's compact design



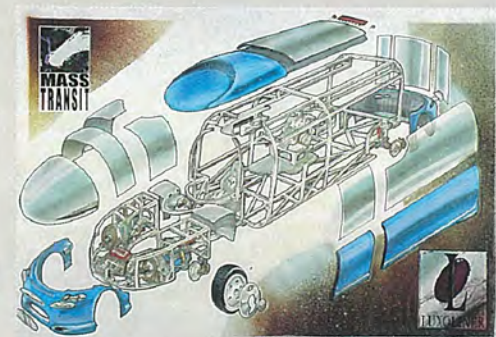
The Luxoliner in its environment of operation.



CAD drawings.



Early concept ideas.



Exploded view showing major mechanical components.



The client for the project is Melbourne based transport design house, **Millard Design Australia**.

Project *Mass Transit*, investigates the problems of urban mobility. It is foremost a proposal for not only a new bus, but a new system. The core of the problem is the inflexibility of today's large scale buses.

The new system responds to a variety of mass commuting needs with the options of a conventional line similar to today's system (the Orbitliner), a taxi-bus hybrid (the Customliner) and a luxury model (the Luxoliner). The vehicle uses mostly conventional technology and manufacturing methods: powered by a detachable electric/petrol powered hybrid motor unit and is front wheel driven.

The bold styling of the vehicle is inspired by early locomotives and the bullet train, creating excitement in an attempt to discourage the "love affair" that people have with their cars. This *must* be reduced in order to sustain mobility into the next century.

The concept of creation has always held a certain fascination for as long as I can remember. Bringing inanimate things together and endowing them with life delivers an intense satisfaction.

Today, as an industrial designer, it is infinitely more complex than the conjurings of childhood dreams could have ever conjured. We now seek not personal gratification, but the satisfaction of others. Through the insight amassed from years of acquired theoretical and practical knowledge, across many diverse fields, I have a responsibility to contribute to the *creation* of a world better than the one we now live in.

The industrial designer is at the forefront of a challenge to restore the ailing confidence in technology, and its role in the future of the earth.

Thanks to all the staff at Millard Design Aust. especially Paul, Gary, Bunker, Stephen, Yan, Craig, Jason, Natalie, Warren etc.

Acknowledgements
Millard Design Australia.



Industrial Design - vital to innovative organisations.

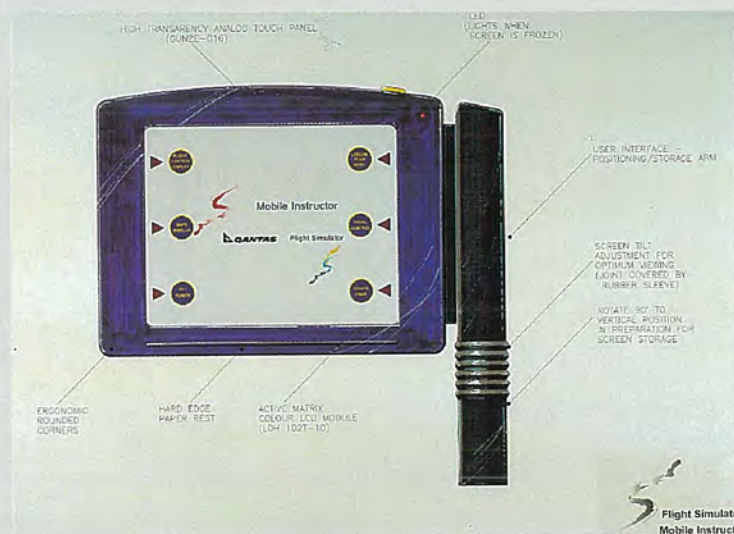
The professional Designer has the power to combine artistic creativity with functional efficiency to develop new product ideas. These may encompass complex themes such as:

- state-of-the-art technology
- material choice for optimal performance
- ergonomic considerations
- user focus
- design for durability
- ease of maintenance
- environmental responsibility
- economical manufacture and time management.

By addressing these challenging issues, Australian companies can develop competitive advantages in today's international marketplace.

Acknowledgments

Qantas Flight Training Centre

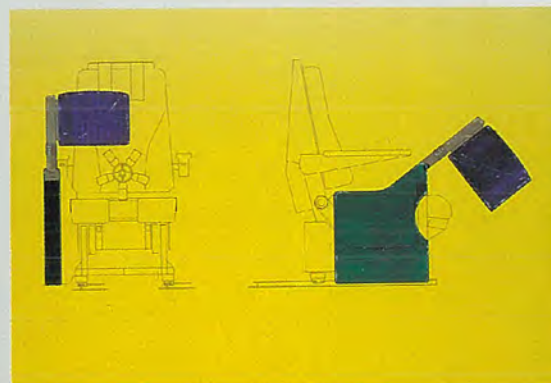


Above: Orthogonal view showing the touch screen interface of the Mobile Instructor unit.

Opposite: Touch screen panel.

Below left: Layout illustration showing how the product attaches to the instructor's aircraft seat.

Below: Storage Of The Mobile Instructor.



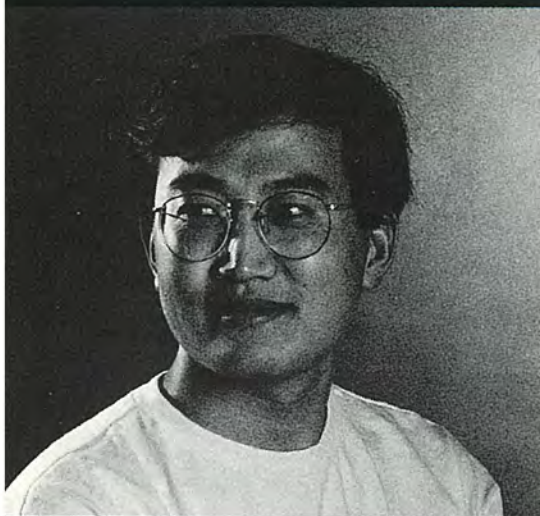
This project required extensive research into the use of the *Mobile Instructor* as a training tool in flight simulation. The full flight simulator faithfully recreates all flight, navigation and system characteristics of a particular aircraft. Airlines such as Qantas use these devices primarily for comprehensive, cost effective training and checking of aircrew.

The *Mobile Instructor* gives complete control of the simulator to the operator, through its touch sensitive panel display and easy position adjustment, during the training or assessing of pilots. The product attaches to the base of the instructor's chair, stows unobtrusively and provides protection from inadvertent screen activation. It can be relocated to a forward position for one-on-one pilot training.

Conceptual ability, a knowledge of engineering, ergonomic and aesthetic principles, cost and market needs, materials and production techniques inspired the development of the final design. Useability is greatly enhanced through simplicity of form and professional appeal. The *Mobile Instructor* thereby promotes successful and efficient flight training.

The role of the Designer is not to be underestimated in the integration of the design dimension in an overall business strategy. The multidisciplinary skills gained during the Bachelor of Industrial Design course, allowed effective communication with industry specialists throughout this project.

Many thanks go to the Flight Simulator division of Qantas for their unfailing support throughout my professional year



I believe that product design is the 'cutting edge' for any business. Innovation, engineering soundness, understanding of the target market and aesthetics are key factors in the execution of a good product design.

I started 'design' when I was a boy making my own toys. The passion of making more complicated things led me to study mechanical engineering followed by work in that field for a few years.

Backed with a different cultural and educational background, and knowledge of the manufacturing environment, with the completion of the Industrial design course, I am now at the starting point of a new design career. I wish to follow enterprises that are aiming for global markets, and that are dedicated to manufacturing with design vision.

Acknowledgements

Australian Museum
Sydney Aquarium

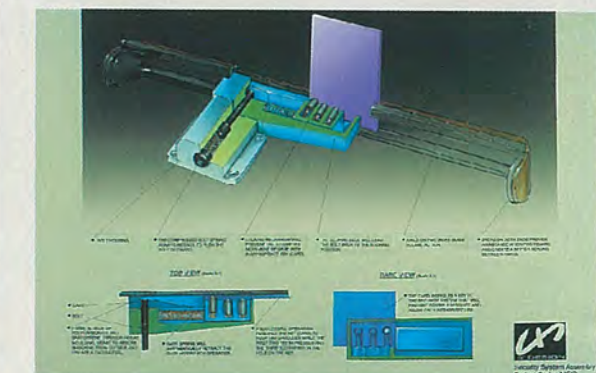
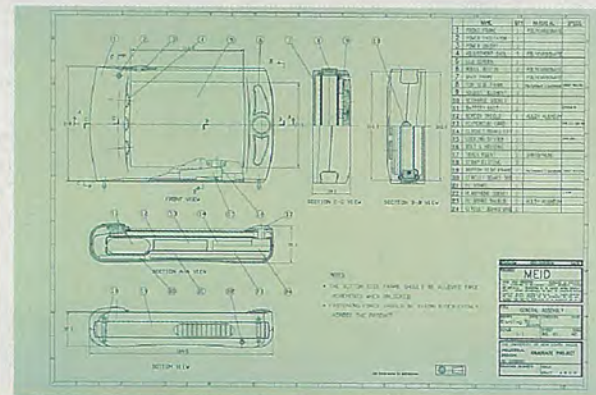


Above: The Product and main parts

Right: General Assembly(CAD)

Bottom right: Security System

Below: The product in action



Project Code: MEID
(Museum Exhibition Information Device)

While computers are increasingly being used in exhibitions, interactions of a different kind are needed. Research indicated there is a demand for a 'personal interactive information device' to make the museum experience more enjoyable and educational.

Initially inspired by the AudioTour (portable cassette players), the project was developed in conjunction with The Australian Museum. The MEID is a portable electronic information system which provides the user with sound, text, graphics and video clips in several languages. The data can be easily updated and stored.

This project introduces PCMCIA technology to the exhibition environment. Its ruggedness outweighs even the benefits of CD technology, and is set to revolutionise personal computer products. For this reason I have chosen this technology for the MEID.

Security features include an inbuilt magnetic strip and a unique MEID card lock. Engineering of the MEID also pays attention to easy disassembly, cost effectiveness, maintenance and storage.

It can be anticipated that this product will greatly improve the enjoyment of the museum experience through its interactive software design and emphasis on ergonomic soundness.

Special thanks to my grandparents, Mr. Yu, Angela & my wife for their love and generous support.



Design Philosophy

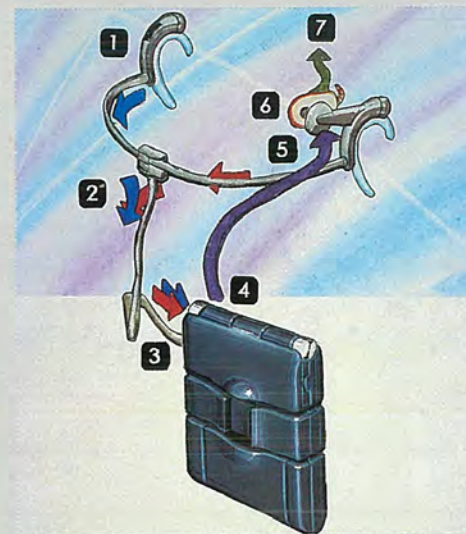
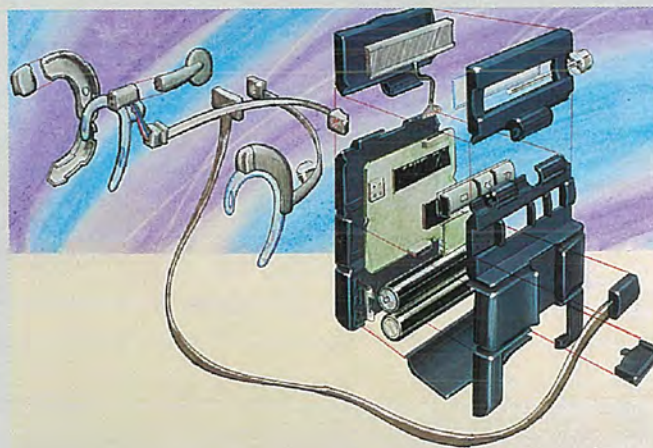
Design put simply, is problem solving for profit. Where profit is obtained by maximising the benefits while minimising the resources consumed.

While this may not be an "artistically inspired" definition of design, it is a practical, working definition which reflects the commercial realities of professional design.

Right: The Child's Speech Processor.

Below Right: Schematic Diagram of how the system works.

Below: Exploded Perspective of the system.



The aim of the project was to explore the possibility of developing a cochlear implant system for the specific use of children aged 1 - 7.

Hearing impaired children do not receive auditory stimulus and as a result these children have difficulty in learning how to speak and communicate. Early implantation is essential to assure that gaps in learning do not occur. In some cases, early implantation is so successful that the children are able to attend regular schools and are able to communicate at levels equivalent to their non deaf classmates.

It is proposed the existing product can be improved to cater for the demands placed on it by infants and children. These requirements are unique enough to warrant a dedicated children's product.

How the System Works:

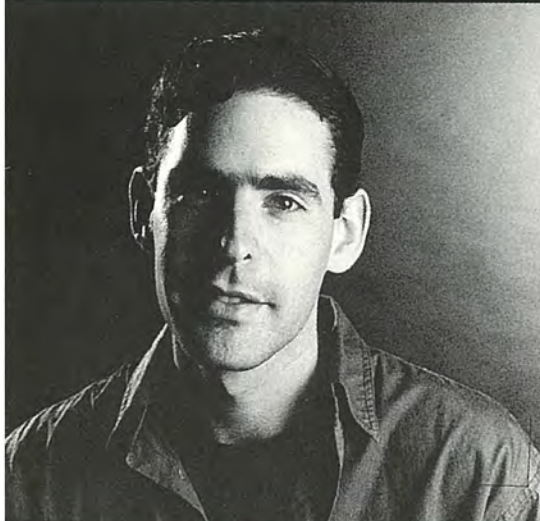
See Diagram Bottom Right

1. Sounds are picked up by the two, forward facing microphones positioned over the ears.
2. Signals are carried down the insulated wires to the Speech Processor.
3. The speech processor mixes the two signals and filters out irrelevant information.
4. The speech processor sorts the sounds into tonoptic ranges, encodes this information in a signal and sends it to the transmitter located on the headset.
5. The encoded signal is transmitted through the skin to the implant.
6. The implant decodes the signal and stimulates the cochlear in the required position to simulate sound of the appropriate pitch and intensity.
7. The auditory nerve is excited and the brain interprets this sensation as sound.

Acknowledgments

Cochlear Ltd.

Coleen Everingham
Children's Cochlear Implant Centre



I have had a keen interest in music since I can remember and have studied music theory for nine years. As a result of this and the fact that I play several instruments, I chose a project where I could combine my design skills and music knowledge.

I believe it is very important for a final project to be a topic in which the student is interested and to which he can apply related knowledge.

The nature of this project is such that technology is not taking over musical instruments, but is used to enhance their sound quality and in turn improve the music that we all enjoy.

Acknowledgments

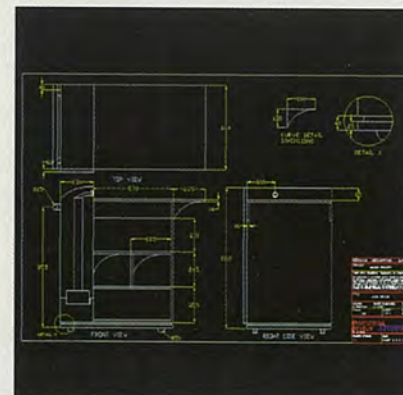
Associate Professor Joe Wolfe, School of Physics, UNSW.

John Lehner Flutes Australia

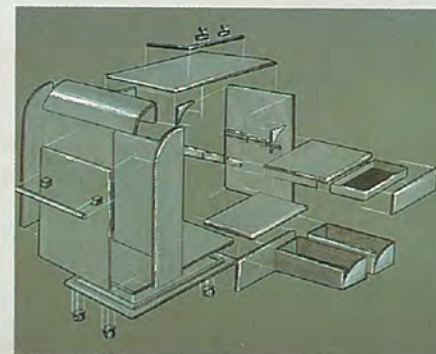


Top: Workstation in use with computer and amplifier.

Right: Workstation dimensions on CAD.
Below right: Exploded perspective of workstation.



Below: Side view of workstation.



To judge the quality of a musical instrument is a task for musicians rather than scientists and designers. However scientists and designers can assist by measurements of the relevant acoustic properties and design of appropriate tools.

This project involved the design of a workstation to house a new technology that will be used to improve design of instruments and maintain quality in production.

The technology that has been developed measures the acoustic impedance of an instrument or how it interacts with a player to produce a sound. A computer then produces a waveform to "blow" into the instrument, and the instrument measures the response.

An instrument will be made and then tested using this new technology. An ideal acoustical level will be noted and compared with the acoustical properties of the tested instrument and the difference will then be corrected by the instrument maker. This new technology will provide a means of objectively and accurately testing musical instruments in the manufacturing stage of production.

In repairing the instrument, this device can be used to locate the exact acoustical problem. This makes the process of repairing more accurate and much faster.

The design incorporates ergonomic requirements, aesthetic appeal and functional requirements while providing the manufacturer with a fully integrated workstation to store and test their instruments. The workstation will also be used as a marketing tool for instrument manufacturers to sell their method of manufacturing.



Design. Conception. Technology. Innovation.

I believe that design should be utilised towards improving the quality of life. One specific area that has captured my interest is in the design of medical products.

In order to design products and equipment for the medical industry, it is extremely important to have a thorough understanding of medical research and science, the appropriate technology and human factors involved with the specific product.

Whether it be to help save or improve the quality of life, being a designer and making a contribution to the development process is most rewarding.

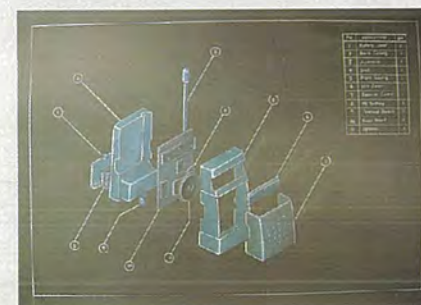
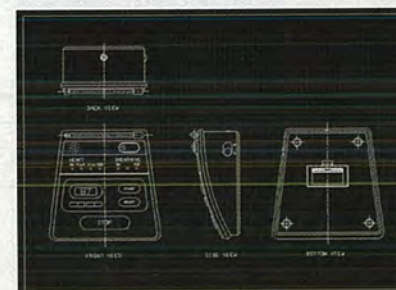


Above: Control Unit and Hand Held Device

Below: Baby wearing vest which contains heart and breathing monitoring devices

Middle Right: Autocad Drawing of Control Unit

Below Right: Exploded rendering of Hand Held Device



The incidence of Sudden Infant Death Syndrome (SIDS) in Australia is approximately 1 in 500 infants. The cause of SIDS is still unknown. Research has identified a number of risk factors which increase the incidence of SIDS:

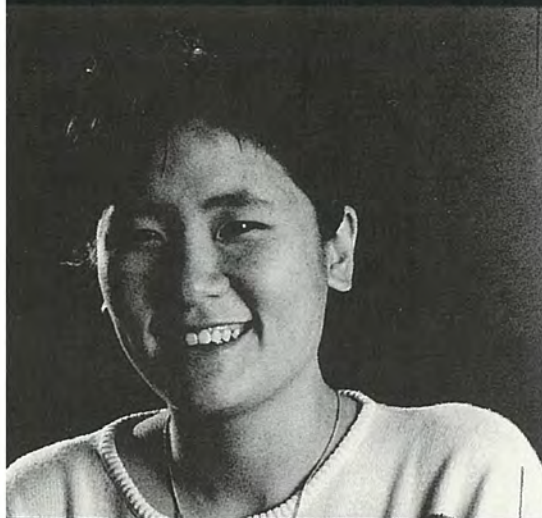
1. Prone (front) sleeping position
2. Smoking environment
3. Overheating
4. Co-sleeping

Currently, the only endorsed products to help prevent SIDS, are home monitoring systems. These range from the detection of movement, to more specific monitoring of the heart.

The difference between the system that I have designed and current monitoring systems, is that it enables a non-invasive technique through the incorporation of the micro-impulse radar (MIR), new technology designed by Tom McEwan from Lawrence Livermore Laboratories in California.

The system consists of three components:

1. Vest which the baby wears containing two MIR's, one for the heart and the other for breathing.
2. Control Unit placed near the baby, houses the controls and visually indicates the various functions and alarms.
3. Portable Hand Held Device which enables the parents to hear the alarm or baby's crying from other rooms in the house.

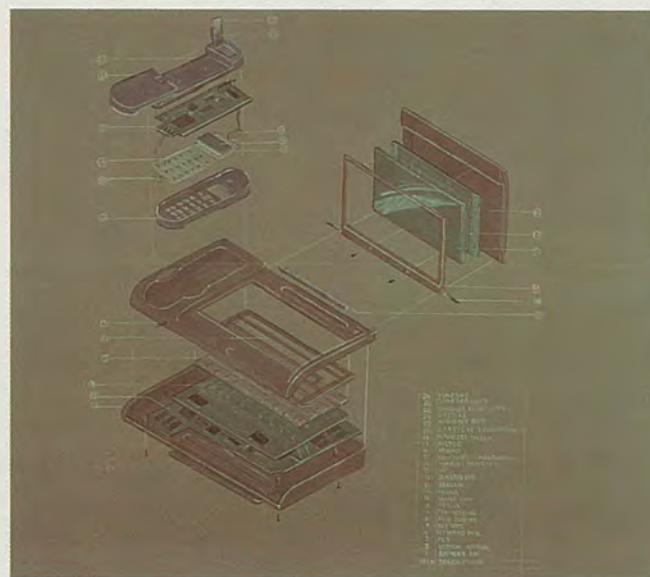


Most people are unfamiliar with the role of industrial designers, yet numerous examples of our work are encountered each day - from packaging to electrical goods, to automobiles and more.

During my studies, I have developed a better understanding and appreciation of products and their development. I believe an industrial designer has the unique opportunity to bring new concepts into realisation; the exciting role of offering design solutions to human needs.



Above: MINT is an integrated cellular fax device that offers the option of a detachable phone. Users can input data via the keyboard, and use the pen to select on-screen menus. Below: Exploded perspective of MINT showing internal details. Bottom Right: AutoCAD is a useful tool to establish the production requirements of parts. Right: The more subdued blue-grey tones relate MINT as a business product.

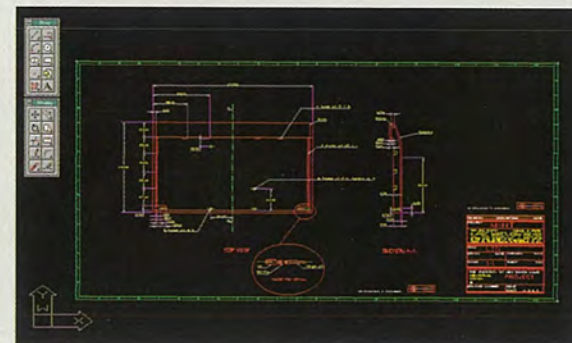


The traditional domains of the personal computer and the telephone are converging in a trend called computer telephone integration (CTI). Wireless devices in particular have added another dimension to communication. With physical links close to saturation, this project targets the transmission of written/graphic material by electronic means.

The design solution proposed is MINT - Mobile Information Network Terminal - a cellular mobile communication unit that combines a telephone, fax modem and an electronic diary. The inclusion of fax technology with a cellular phone offers a less obtrusive alternative as well as greater privacy to the user.

The technical package for MINT is derived from existing digital cellular telephone and modems. Exploration of the interface was an important part of the design process due to the range of human-machine interactions. Thoughtful application of ergonomic design can enhance the user-friendliness of an electronic product.

With the number of mobile subscribers around the world forecasted to reach 100 million by the year 2000, MINT has the potential to create a whole new segment within the hand-held communications' market.





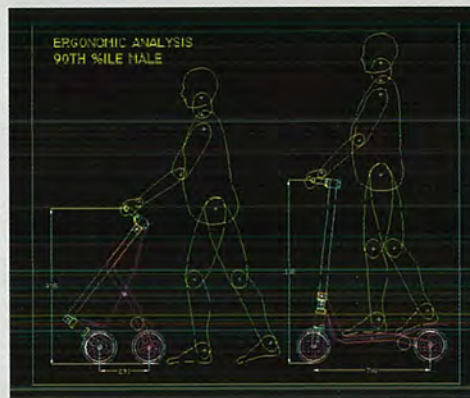
Integration between design, marketing, manufacturing and engineering has encompassed the philosophies, attitudes and teachings experienced as an undergraduate of the industrial design (b.i.d.) program at the University of New South Wales. Combined with understanding and consideration of the relationships between innovation, aesthetics, ergonomics, technology and the consumer, these elements frequently distinguish good design from an ordinary product.

These four years have shaped my future. Ahead, awaits a career in industrial design. As a graduate of the b.i.d. program I feel great confidence and anticipation for the challenges that lie ahead.

It would be remiss of me not to mention Michael "Stealth" Razic for all the help throughout my final year. To everyone else who helped make this project what it is, many thanks. I haven't forgot.

Acknowledgments

Chess Engineering Pty. Ltd.
Calon Technology Co. Pty. Ltd.
Bearing Technics Webster



Left: The electric skate in riding position. Potential to suit a wide range of markets and address a variety of consumer needs.
Above: Early concept development sketch.
Bottom Left: CAD assembly incorporating a 90th %ile male with relation to the two main ergonomic tasks.
Below: Compact. The skate when folded saves space and is easily transportable.



The electric skate presented a wide range of technical and aesthetic issues worthy of a final year project. The resultant product utilises new technology, manufacturing processes and materials to provide a flexible design which adequately addresses the needs of the diverse markets to which it appeals.

The electric skate combines elements present in products such as the motorcycle, bicycle and skateboard into one integrated design innovation. It is a product that has great potential to suit a variety of applications and several distinct markets:

Industrial - where large distances across factory floors and between buildings on large lots creates a need for a low cost, light, maneuverable, low maintenance form of transport.

Commercial - for use by security, attendants and other employees in such applications as shopping complexes, amusement and theme parks, parking stations, resorts, etc.

Domestic - where the market ranges from simple fulfillment of commuter needs to a new, form of urban transport for the youth of Generation X and beyond. The integration of a compact, maneuverable, means of transport such as the skate, to compliment the increasing demand for more effective mass transit systems would help reduce the toll on our already failing ecosystem.

With likely appeal in international markets, where culture and lifestyles better suit the use of such a product, the electric skate has the potential to provide another opportunity for Australian design and manufacture in the international marketplace.



Vision. Creativity. Change.
Design provides a place where inspiration and aspiration can meet.

It would be too ambitious to try and define exactly what it is about industrial design that excites me. Rather, it is a host of things, from seeing how a product can change the quality of life to the form of a product and the way it communicates beauty and quality.

Industrial design has changed the way I look upon the world. Studying industrial design has infused drive and determination within me, an asset that I believe, will be invaluable in the future. I intend now, to embark on a design career that is both challenging and meaningful.

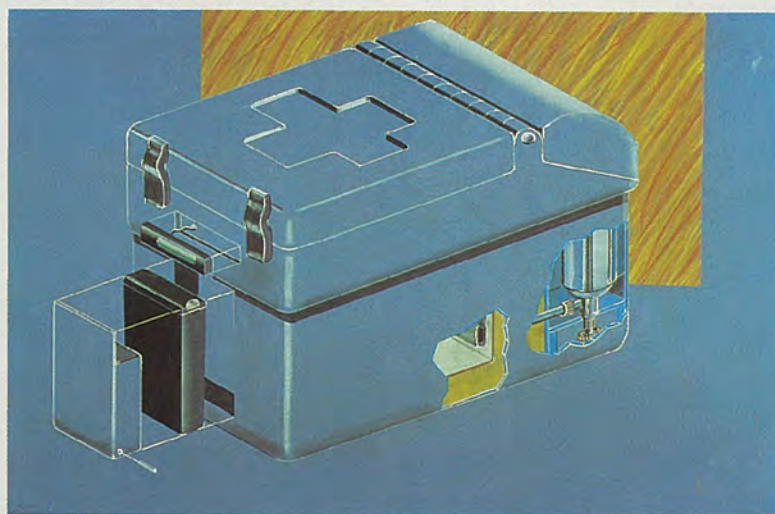
I would like to especially thank Kurt Seemann and Christopher Fung for their guidance and support throughout this project.

Acknowledgments
Centre for Appropriate Technology, Alice Springs.
ASP Plastics



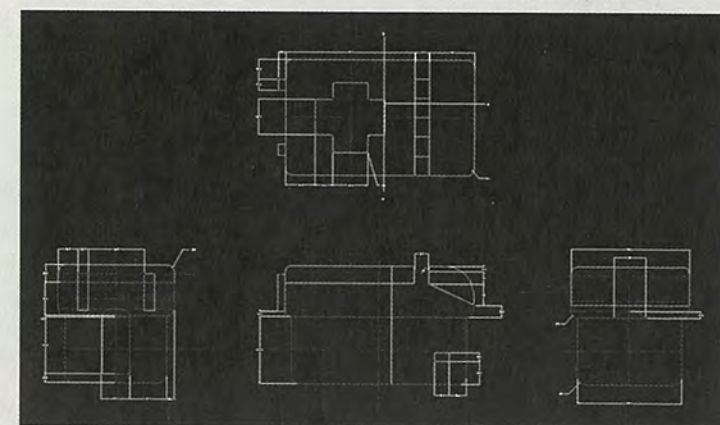
Above: The vaccine carrier has space for a spare butane can. It also incorporates the Fitpack which stores new and used syringes

Below: Rendering showing Fitpack, thermometer and valves



Above: Fitpack hatch and thermometer

Below: CAD orthogonal drawings



Vaccines must be stored between 2 to 8 degrees Celsius. Long distances and unsealed roads to remote communities present problems in keeping vaccines cold. This carrier improves upon the current "ice pack and esky" method of transporting vaccines. It uses butane to keep the carrier cold, and eliminates moving parts.

The monitoring thermometer, syringe hatch, ease of operation and maintenance make this carrier an integrated vaccine delivery unit which is both durable and reliable. Hence a greater number of potent vaccines will be administered, decreasing the likelihood of a child contracting illnesses such as hepatitis and whooping cough.

The carrier has market potential not only in remote Australian regions, but in developing countries, military health units and urban medical and veterinary delivery systems.



Good design is not merely aesthetic camouflage, but rather demands an effective fusion of the creative with the practical.

In this respect Industrial Design is a challenging profession. A sensitivity to a diverse range of disciplines and their refined integration is required.

It is this approach that I wish to develop and apply to product design.

Acknowledgements

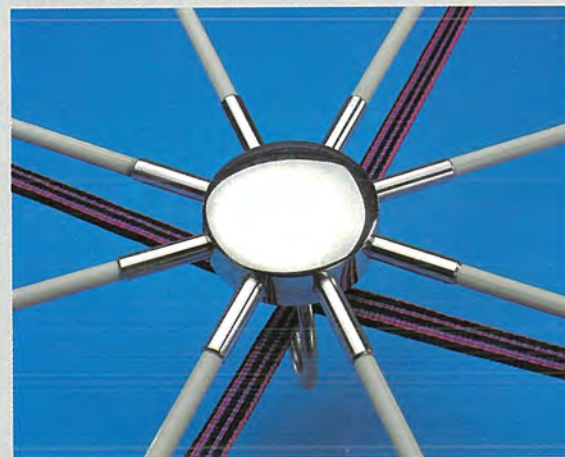
Macpac Wilderness Equipment
Permex



Above: Sunshade fully assembled.
Inset: Skeletal fibreglass frame.

Below: Concept rendering showing modularity.

Below: Centerpiece detail.



The depletion of the natural ozone layer has caused an increase in Ultra Violet radiation levels at the Earth's surface. This has heightened the need for protection from sun exposure.

Australia is noted as having the highest incidence rate of skin cancers and melanomas in the world. Efforts made by the Australian Cancer Council have resulted in preventative measures being readily adopted by Australians and greater public awareness.

Australians are very much outdoor oriented. Greatest exposure risks occur whilst engaging in stationary outdoor activities. Often the needed protection is either unavailable or impractical.

The principles of Industrial Design were utilised to provide a solution in the form of a free-standing portable shade unit, offering users protection from environmental elements.

Other contributing factors impacting on the design included; versatility, portability, and ergonomics.

The design is totally self supportive thus can be erected on any surface. The use of fibreglass ensures that the frame is light weight, durable, and easy to assemble. The innovative design obviates the need for a center pole or guy ropes allowing unrestricted movement within and around the shelter. The canopy employs Macpac UV40 fabric - being UV resistant and waterproof, thus facilitating functional versatility.

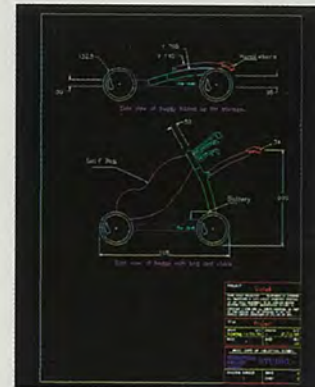


Industrial designers must approach their work with a sense of responsibility, as the products they design directly affect the lives of their users. For products made especially to improve convenience, such as golf buggies, designers should constantly re-evaluate the effectiveness of available products.

In everyday life, we all encounter different products, tools and appliances which often do not optimally fulfill their function because of poor design. As an avid golfer and design student, I became aware of the specific shortcomings of golf buggies. I realised there was a great potential for improvement on the currently available designs and technology, simply because the existing buggies on the market could be more finely tuned to the needs of the consumer.

Acknowledgements:

John Turner, Green Arrow Australia.
Andrew Holm, Materials Consultant.
Colin MacKinnon & Lothar Zilian, Rotadyne Plastics PTY LTD.



Golf buggies, although conveniently electrically powered, are heavy, cumbersome and often inefficient. Ironically, golfers need easy to handle, versatile and easily stored equipment, not to mention that many are elderly and find heavy objects hard to handle. It was with these issues in mind that I decided to re-design the structure and use of technology in my own golf buggy. The *Valet* golf buggy has a significantly lowered structural weight due to the use of plastic frame and technologically advanced motor and battery. At the same time, it has been designed for easy storage and assembly.

In combination with other design innovations, these two principle improvements make the *Valet* very 'user-friendly'. Golf is one sport that older people can readily enjoy. If a buggy is produced that can take the hassle out of carrying or pushing clubs around the course, it has the potential to keep people active and healthy well into their latter years.



Top left: Rendering of handle bars
Top right: Cad drawing showing how the buggy folds up.
Left: Buggy in use.



Every time I was re-fuelling my car I thought that I should be more comfortable. The process of fuelling was always a cumbersome job in my life. I also heard others complain about this too. From this I decided to develop ideas to create a better environment for refuelling. I believe that less is more and this was what I set out to achieve in my design.

I would like to thank David Burns who has given me much confidence and help with my project and Phillip Butterworth from Gilbarco, Ellen Ruhotas from Email Petroleum, materials consultants Andrew Holm, Fred Riddle from Du Pont, Tony Ging from ASP Plastics and Mr Yun Geun Kim for constant support and help.

Acknowledgments

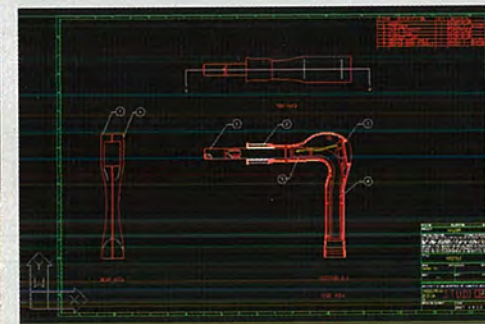
Gilbarco, BP, Email Petroleum, Du Pont and ASP Plastics.



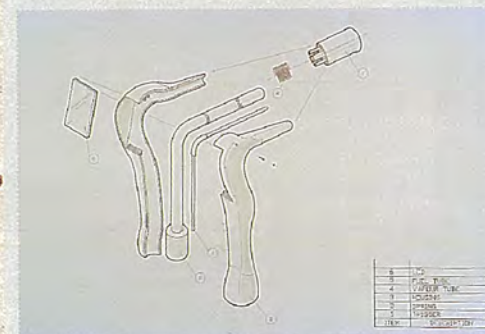
Above: Petrol Pump and Nozzle



Above: A closer view of the nozzle in a hand



Above: Assembly drawing of the nozzle



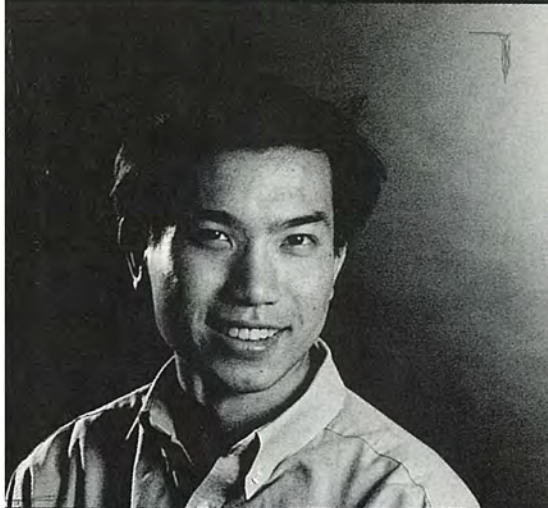
Above: Exploded view of the nozzle

Almost everyone refuelling their vehicle would have experienced some kind of discomfort during the procedure. The gas vapors from the fuel is irritating to the nose and harmful to the lungs. The necessity to constantly monitor the display unit to control the cost and fuel consumption is always an issue.

The aim of this project was to create convenience and efficiency for the users of cars through the redesign of the petrol pump nozzle.

The possibilities explored in the project were :

- vapor recovery system for better fuelling environment,
- electronic display of price and volume dispensed on the nozzle itself,
- ergonomically designed nozzle for better human interaction.



The past 4 years have been the most influential period of my life. I've learnt a lot about others and myself.

My opinions, abilities, and the way I think have been shaped by the industrial design course. Design has become a key part of my life.

Almost every product I see receives some level of design critique. How was it made; were appropriate materials used; what are the ergonomic and usability outcomes; where could it have been improved?

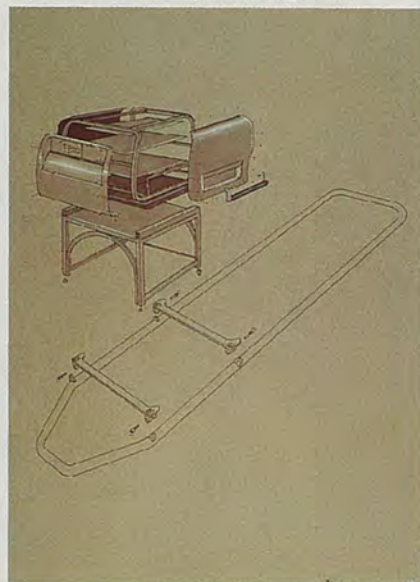
The people I've met, especially during this final year have made it worthwhile. Special thanks to Dr. Blair Munford for his time, and the paramedics and flight crew who allowed me to observe them on missions. Without their expert advice and experience, this project would have been less than what it is.

Acknowledgments
Careflight Limited
Auto Avia Design



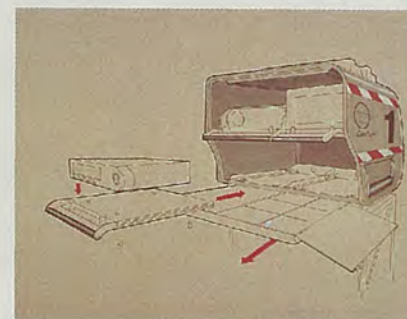
Above: The stretcher bridge unit at the Careflight base, loaded with standard equipment.

Below: Exploded view showing main assemblies. Lower support frame and upper storage unit.



Below right:
The unit is placed at the end for structural reasons & for ease of use with obese patients.

Below:
The modular tray system allows for rapid removal of equipment, and equipment upgrades. It also connects to external power supplies automatically.



The Client

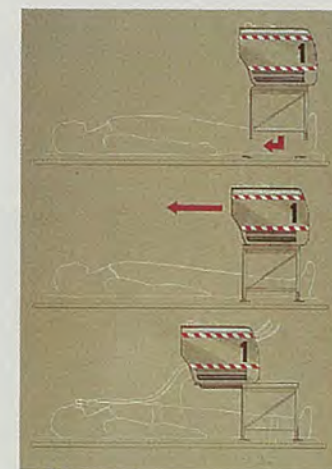
Careflight provide mobile intensive care teams, conduct rescues, attend accident scenes and transfer patients from one location to a suitable hospital. Careflight undertake missions nationally and internationally using ground ambulances, air ambulances and helicopters.

The Problems

The key problem was the way medical equipment was transported. Observing missions showed that an easier to use and flexible system was required. The main aim was to improve the usability and ergonomics of the intensive care unit, while minimising weight. The product was also required to be adaptable to constantly changing medical equipment, stretchers and vehicles.

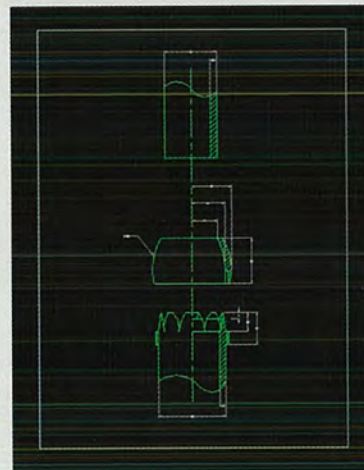
The Solutions

The design results in shorter turnaround time between missions, faster transfer of patients and increased efficiency of the doctors and paramedics. Staff can now spend less time interacting with equipment, and more time with the patient.





Understanding design means understanding how all the elements of marketing, ergonomics, engineering and manufacturing fit together. Design used to address a human need within a commercial context is part of the challenge for an industrial designer, especially when the market for a particular product is relatively small.



Above: Illustration of how the chair may be adjusted

Above left: Shower commode

Left: CAD generated drawing of the adjustment detail

Equipment for people with disabilities is an area which has not been highly developed in Australia. The shower commode, though one of the most common pieces of equipment used by people with reduced mobility, displays inherent problems.

The individual needs of the users are diverse. No one user has the same requirements as another. Thus the product designed for this market had to be easily adjustable to suit as many users as possible. The footrests and backrest have been designed so that the heights may be changed to suit each individual, according to their needs.

The commode has not only taken into account the needs of the main user, but also the needs of the carer. The armrests and footrests swing away for easy transfers. The backrest components swing back for easier back washing of the main user. Maintenance and cleaning of the chair has been taken into account with easily removable cushions and the absence of potential dirt traps.

The issues of comfort and aesthetics have also been addressed. Padding has been shaped to comfortably accommodate the body. Larger wheels have been used in the rear to increase stability whilst still maintaining maneuverability. Also the commode has been designed to fit in with the household environment. It folds easily for travel or storage without compromising on stability and durability. Despite its many features, its costs are still competitive with those commodes already on the market.

Acknowledgments

Met-a-lite Manufacturing



The Industrial Designer is a jack of all trades. As a catalyst for innovation he or she must be proficient in the art of communication both visually and verbally to give life to creative ideas. We face the challenge of harnessing the dynamics of advancing technology and working in union with every other discipline to design products high in quality and competitiveness.

I wish to thank all the industry support received throughout this project, specially Alfie Ma from SITA and Stephen Hall from Apple Australia.

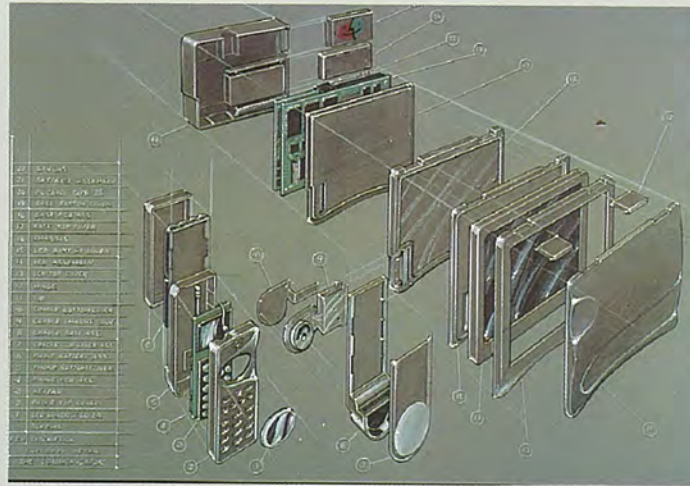
Acknowledgments

Sita
Airline Telecommunications and
Information Services

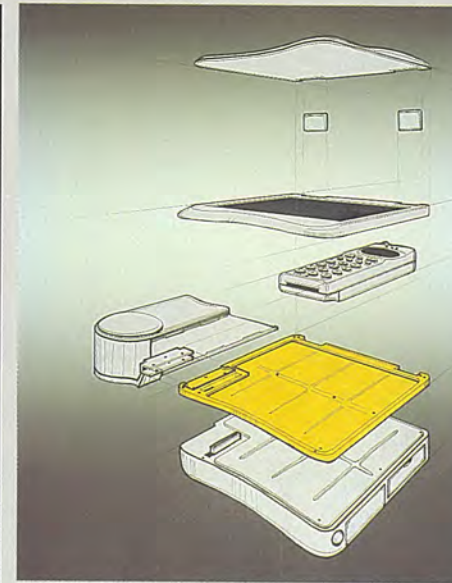
Apple Computer Australia



The Communicator: Generated by an effort to blur the edge between human and machine, human factors stands out in the Communicator's definition of forms, with three dimensional curves expressing its compact body and simplicity of use.



Exploded Detail: The physical structure is based on providing modular components, leaving consumers with a choice in their product configuration at the time of purchase and in the future.



Vision of Modularity: In time, the Communicator's obsolete components can be replaced with new technology, and increasing the flexibility for consumers and manufacturers alike through selective parts purchase and replacement. The base, screen, phone & handset cradle are part of this replacement system.



Detachable mobile phone: The GSM phone acts as a wireless modem giving access to the phone line for a variety of data transmissions whilst on the run (phone calls, fax, e-mail). The offer resembles a mini office which fulfils the demands of individuals whom aim to stay in touch, constantly.

The Communicator is a per based personal tool. The function of a phone organiser and facsimile have been combined to provide a sensitive solution to mobile communications. With a Type3 PC slot, serial port, 4MB ROM, Apple or IBM compatible software, internally housed stylus, touch sensitive LCD screen, detachable GSM mobile which also acts the fax/modem, interchangeable nickel metal hydride batteries; this project has been driven by the vision of the day when PDAs (Personal Digital Assistants) will be as common as calculators.

The Communicator is also based on several keywords arising out of wide ranging technical and consumer research. It's features are summed up by convenience, effective communication, component modularity, ergonomic sensitivity and product longevity. All these factors were combined to give the communicator a unique identity.

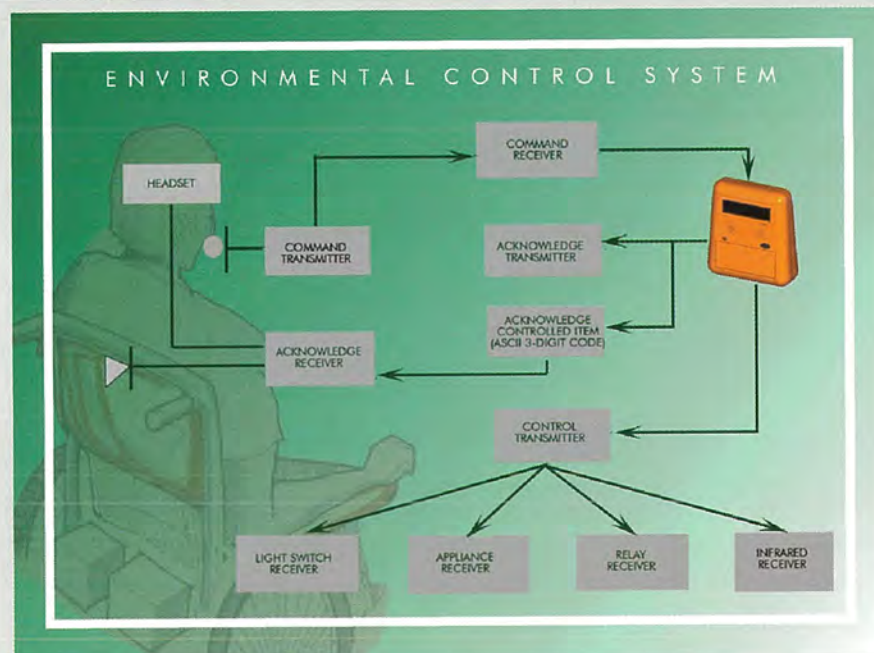


I believe the industrial designer has a key role as the mediator between the profusion of information and technology available in the commercial industry and the needs of consumers. He or she is called to account for even the small and seemingly insignificant details of product design on behalf of the consumers and especially for disabled users, to identify not only their product needs but to also seek to understand to an extent the frustrations, the personal dreams and hopes of individual users.

I wish to acknowledge and thank Graeme Smith, Greg Killeen, Simon Mahoney and John Bennett for their time, support and expertise.

Acknowledgments

Ability Computer Services
Australian Quadriplegic Association
Mastervoice
Benbro Electronics



Above: Flowchart illustrating the function of the Environmental Control Unit.
Below: AutoCad solid modelling of the Environmental Control Unit



Above: The Environmental Control System

Environmental control systems are devices or systems which allow for alternate access to electronic or electrical devices and those objects such as doors and beds which are able to be modified for use with electricity. These are among the growing number of technology products being developed or adapted for the use of disabled people to raise functional abilities and reduce handicaps. It has also provided some of the practical means for people to choose independent living where the choice did not exist before.

Among the environmental control units on the market however there are only a few products which are both versatile and reliable for individuals with varying handicaps as well as being affordable. The present environmental control system aims to address a range of problems through the application of voice recognition and speech synthesis technology (which is finding growing prominence in the environmental control market) and radio frequency technology, to provide a system which is both versatile and adaptable for the individual needs of people with severe disability.

The voice recognition ability allows a person to speak simple commands, such as 'light', 'on', which will turn the light on. These commands which are spoken in sequence are transmitted through radio transmission to the different products to be controlled. Wireless transmission between the various units which make up the 'environmental control system' also affords greater flexibility as to where the user has environmental control. These are features which may contribute to enhance the quality of life for people with severe disability.



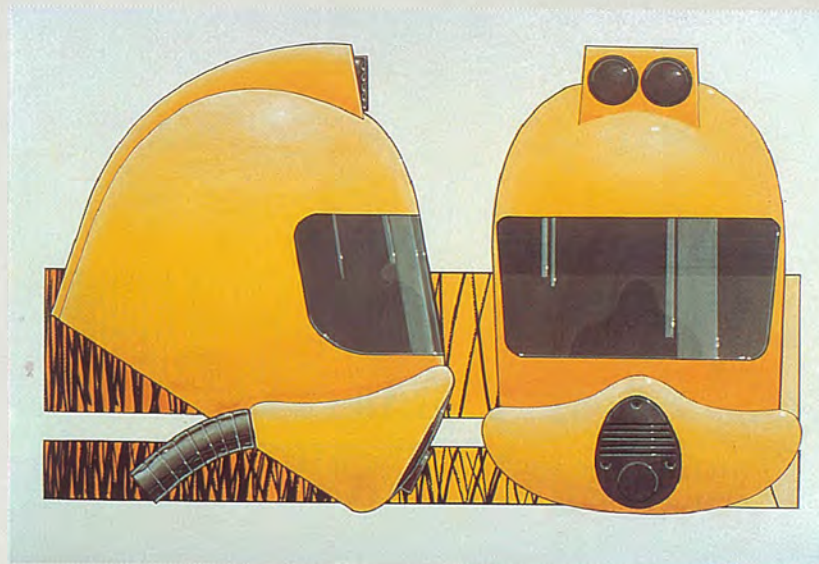
Industrial Design fuels consumerism and increases the depletion of unrenueable resources. A lot of design is a large product cost afforded only by the privileged and serves to highlight the growing disparities between rich and poor. However we can design for the future and longevity.

Nick Spratt an industrial designer,

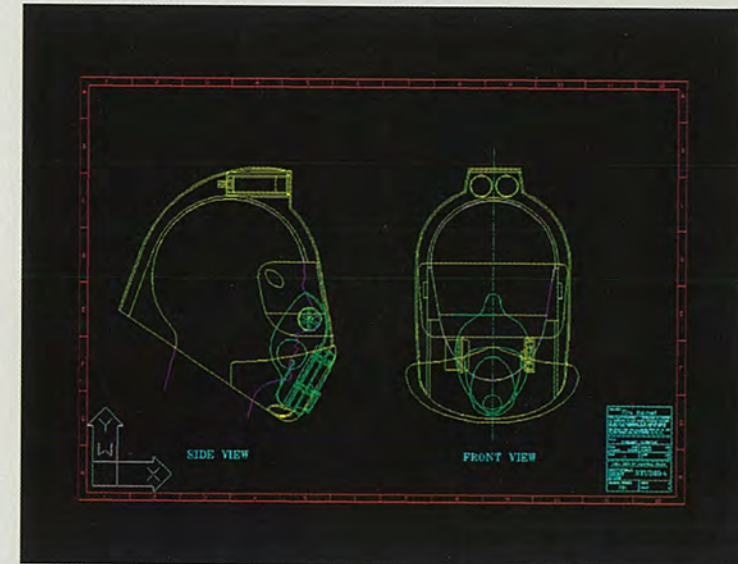
An industrial designer is a jack of all trades, of marketing, design and engineering. But, equally risks being a master of none. As such, it is a successful industrial designer who can manage the information and personnel from many disciplines to fulfill the needs of their company and client or consumer. Industrial Design is a market need driven service. Management, intelligence and communication being the key.

Acknowledgments

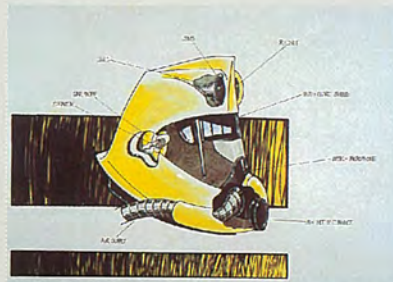
Racal Health and Safety



Rendering.



CAD



Concept.



Model.



A fire helmet serves two primary functions for a firefighter. It provides protection and utility. This project aimed to increase the helmet's utility through the application of technology, whilst extending the range of environments in which the firefighter can safely operate.

The design was most influenced by the ergonomic requirements of the firefighter, strict Australian standards relating to safety helmets and the integration of the technologies which improved the functions of the helmet.

Research and technical data was difficult to collect due to both the pertinent manufacturers being based overseas and their reluctance to share details of military related technology. The project was completed with the assistance of Racal Health and Safety.

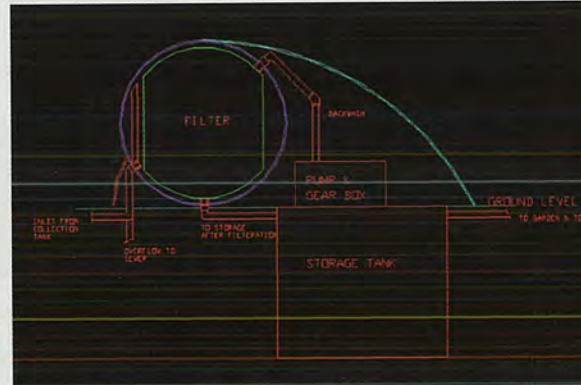


We learn a lot of disciplines in this course; marketing, engineering, etc. This in turn builds up our knowledge so that we may apply them to our design. However, the most important skill we develop is our *way of thinking*, which allows us to be creative and to visualise the future. Further, we apply this thinking to design.

Design is a tool used to meet human needs. We have to compromise human benefits and comforts with our environment. We should design products that achieve a balance between human needs and nature.

Acknowledgments

Business Development Manager
Aquatec-Maxcon Pty Ltd
Dept. of Public Health Engineering, UNSW
School of Mechanical & Manufacturing Engineering, UNSW

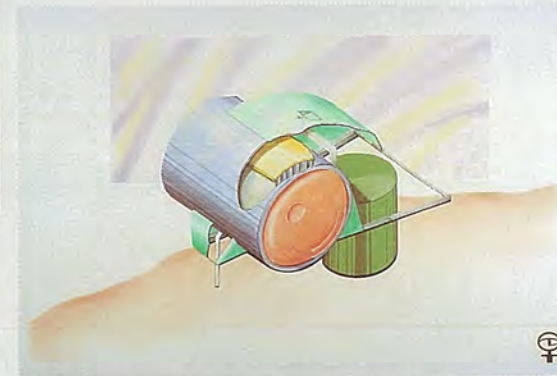


Above: Diagrammatic representation of the treatment unit

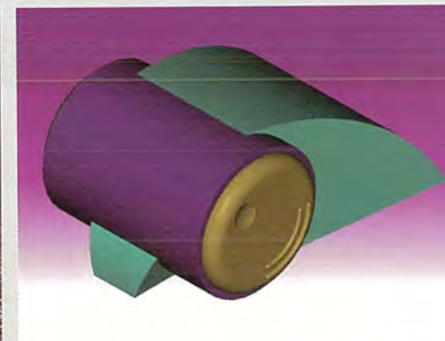
Below: Model in environment of use



Above: Flow chart of the overall system



Above: Perspective section of the final concept



Above: Solid modelling in AutoCAD

Have you ever thought about reusing the wastewater around the house? Of course you would. Water is a scarce natural resource. It is not unlimited and it is running out because of all kinds of pollution and human misuse.

The demand of water will keep on increasing because of economic development and population growth. Therefore we have to look for a solution before we face water shortages.

This project is based on the theme, 'What came from the earth should go back to the earth.' The system reuses the water from the shower, laundry and basin. It is stored in a collection tank temporarily and pumped through filter and stored in the storage tank for disinfection. The reclaimed water will be used for toilet flushing and watering the garden.

Wastewater from kitchen is excluded in this system because the grease will form blockages and damage the system. Blackwater (waste from toilet) is not considered at all because it is hard to treat to a satisfactory standard in a household scale system.

Reusing the greywater can reduce about 35% of water consumption per person, daily. Therefore, it is worth considering. Hopefully through this project, people will consider recycling and have more concern for our environment.



Industrial Design brings visual form to a technical package. Through the use of colour, line and texture the designer can give a product life, and create emotional responses.

At the same time, a level of quality and engineering excellence must be achieved to meet the growing demands of the consumer.

The cycling industry demands products that are technically advanced and have a high level of aesthetic appeal. Therefore, one of the design criteria for this project was to develop the product in a functional yet innovative way.

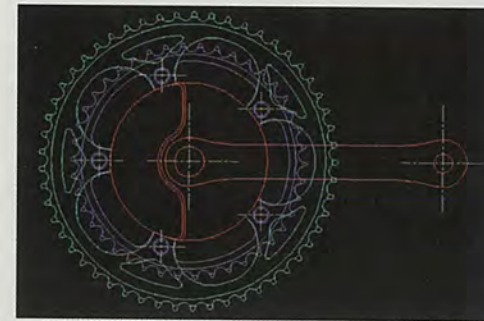
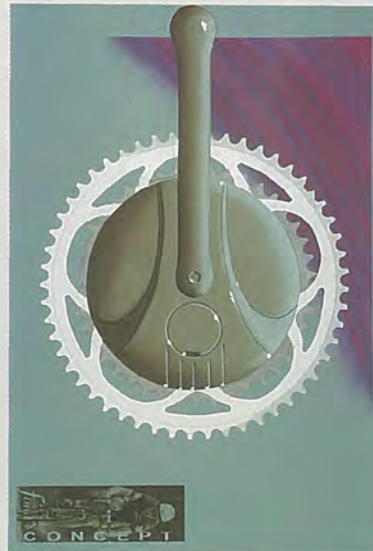
Acknowledgments

Les Wills
Tim Olds
Kevin Norton



Above: Bicycle crank and integrated display system.

Below: Concept rendering of bicycle crank.



Top right: Display system in environment of use.

Middle right: Crank in environment of use.

Bottom right: CAD drawing showing Front view of crank.

The Product:

The primary function of the product is to determine the power output of the rider. The product also determines other features such as distance travelled, time and cadence.

The Market:

The availability of a power readout on the move incorporates new technology. This can benefit elite cyclists by maximising their training efficiency through the use of programmed power zones.

Sports academies in particular can effectively utilise the information that this product provides.

The Design:

The design process was a development of the ergonomic, engineering, manufacturing and marketing considerations.

One of the most important factors was integration, and this led to the final design. The display system was designed to be a part of the bicycle, rather than a separate accessory. This involved the design of an integrated goose neck system. This theme was continued, with the computer hardware housed inside the crank. This solution eliminates "add-ons" which can clutter the bicycle and are easily damaged.

The product provides the cyclist with a complete system that helps improve training methods and efficiency. It is easy to use, and provides appealing aesthetics which are so important to this market. It is a significant development in the lead up to the Sydney Olympics in the year 2000.

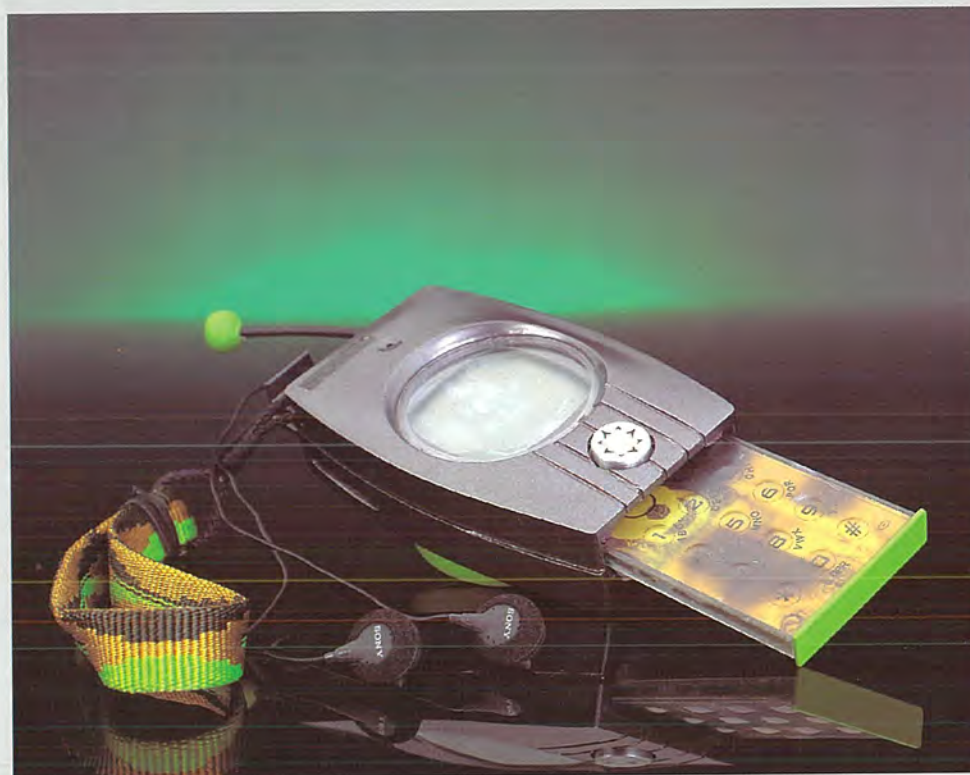


"Music-On-Demand"

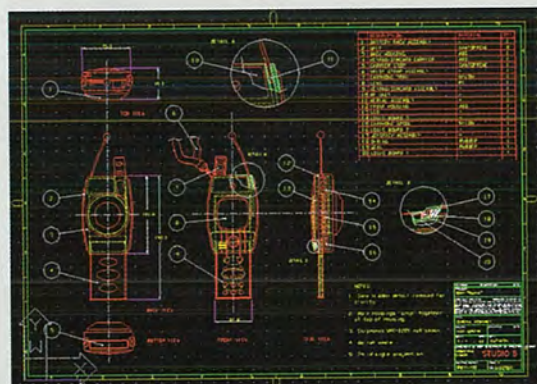
The development of the Cellular Communications Network (CCN) in the late eighties has lead a rapid change in the way people interact at both a business and social level. It has broken the shackles that tie the traditional telephone to its fixed location and allowed literally millions of people (in Australia alone) to communicate and manage their time more effectively. The advent of the "Cellular Phone" or "The Mobile" as it is more affectionately known is the product leader for the utilisation of this technology.

Essentially two types of networks exist; Analogue and Digital. The nature of the digital system allows not only for voice transmission but is capable of all types of data transmission, including voice, text, sound and image information.

Acknowledgments:
SONY AUSTRALIA LIMITED.
New Products Division

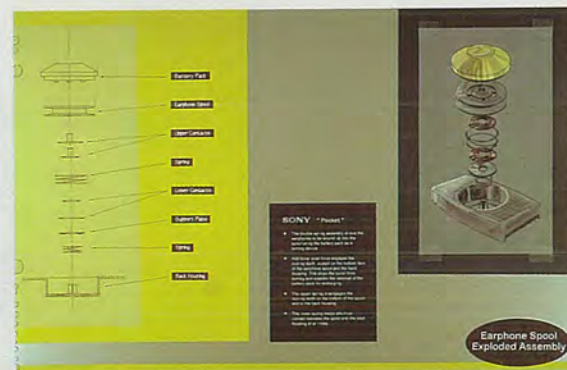


Above: The SONY "Pocket". A communications device utilising cellular technology to give the user Music-On-Demand.



Above: General Assembly Drawing produced using AutoCad, a computer aided drafting package.

Right: Exploded assembly drawing showing earphone/battery locking mechanism.



The SONY "Pocket"

The SONY "Pocket" utilises these attributes to bring the user a communication device that is capable of "down-loading" stereo sound over the network to be played back at their leisure. The benefit of this device over a traditional "walkman" is that the user has unlimited access to a "virtual" library of tracks; from "Beethoven" to "Metallica". The need to carry a bag full of tapes or CDs is eliminated and for what is expected to be a small access fee, the user can literally have every recorded song available at any time of the day or night.

The SONY "Pocket" also functions as a cellular phone. All functions of the device are accessed through a menu driven LCD screen including the selection of tracks from the "virtual" library.

There exists the opportunity to extend "Mobile communications", as a technology into the palm of virtually everybody on the planet. This can be achieved through more appropriate, strategic design/ development of the technology into the market place and a stronger integration of respective segments' needs. The youth/ sports segment is one such area in which cellular communications technology has had little or no penetration.

The SONY "Pocket" addresses these opportunities.



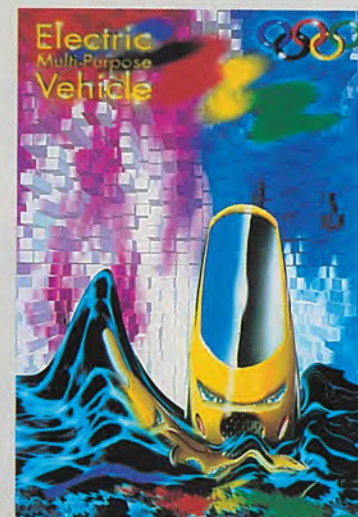
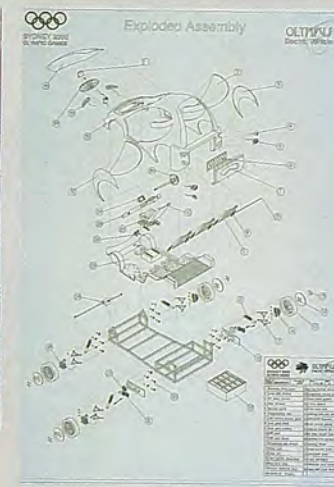
Above: Photo realistic Computer Rendering.

Above right: Exploded Engineering Drawing.

Right: Computer Generated Rendering.

Below: Scale Model

Below left & right: Photo realistic images of vehicle at the Olympic Park.



Such a vehicle would function during ceremonies; would serve the purpose of site and security maintenance; transportation of special guests and lost children; as a first aid vehicle and for the transportation of sporting equipment.

The cars image would combine the festive with the scientific, reflecting the new millennium.

Extensive research into means of alternative eco-friendly fuel sources, led to the application of state of the art battery-motor technology.

The vehicle has been ergonomically designed to seat four, and can achieve a top speed of 30 km/h, for a range of 150 km.

The state of the art Ni-Cad battery power source allows the vehicle to be rapidly charged to 50% capacity in only 1 hour and is capable of 7-10 years of service life.

The vehicle's styling was of the utmost importance. Being somewhat a flagship product - an example to the rest of the world of Australian design - the vehicles aesthetics, as well as its performance, had to excel.

On Friday, September 15 in the year 2000, Sydney Australia will be host to the biggest sporting event in the world; the Olympic Games. Hundreds of thousands of spectators will visit from around the world to watch some 15,000 sports men and women battle it out for athletic supremacy.

The staging of an Olympics holds many social, economical and most importantly, environmental implications.

Current transportation systems cause proven damage to the environment and utilise fuels from dwindling resources. The Olympic games will place a huge burden on Sydney's transportation system - with the environment paying dramatically for it.

The objective of the project was to design and develop a unique transportation solution, which would meet a specific need, whilst most importantly alleviating some of these environmental problems.

Acknowledgements.

Thanks to: Signsplus International Holdings Pty Ltd, John and Sandra.

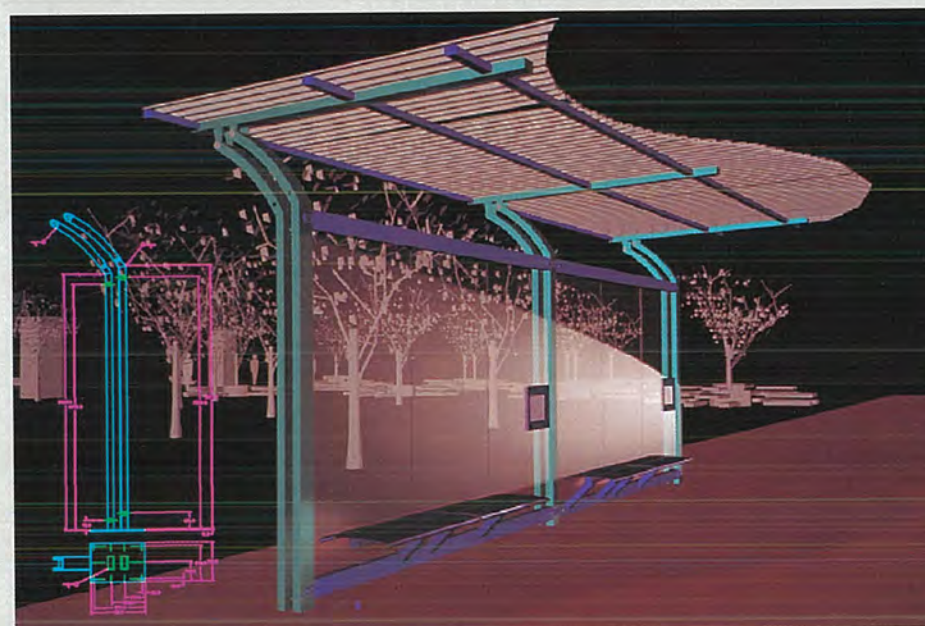


Above: 1:1 Prototype Model of Whitecap Shelter Design, Right - Compression Strut and Curved Post Connection Detail

The seating developed for the system is manufactured by roll-forming technology, producing a single section. This single section can be configured to create a seat pan, backrest or a 'bum rest'.

The Information Console was developed to explore the 'face' of public transport in the future; to afford users of public transport a greater information base and enhance the quality of public transport through the provision of interactive information.

Special thanks to BHP Research for sponsorship and in particular to Doug Matthews, Ivan Tacko, and Todd Tindall.



Above: 3-Dimensional Computer Model of Coastline Concept, Right - Willow Concept, showing Y - Post Configuration.



Street furniture in Europe has long been seen as an important part of the urban environment. Australia is now beginning to recognise the importance of street furniture and consciously consider it's impact on the urban landscape and culture.

Bus shelters are the most prominent form of street furniture, and play a major role in the delivery of urban transport to the community.

The SBI project emerged upon recognising the importance of street furniture, and in particular, bus shelters.

The result, is a modular bus shelter based on a curving post. It is designed to be incorporated into a wide range of frame configurations and is the platform for the attachment of roofing. The form of the roof can then be custom designed to fit the local environment in which the bus shelter would be placed.



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 IDES 1041 Visual Thinking & Drawing
 IDES 1061 History of Art, Architecture & Design
 IDES 1051 Geometrical & Mechanical Drawing

Year 1, Session 2

IDES 1031 Design Studio 1
 IDES 1073 Principles of Ergonomics
 IDES 2121 Introduction to Computing
 IDES 1011 Workshop Technology

Science & Engineering

MATH 1011 General Mathematics 1B

MATH 1021 General Mathematics 1C
 PHYS 1939 Physics
 IDES 1082 Engineering Design Mechanics

Commerce & GEP

GEP General Education Program

Year 2 session 1

IDES 2091 Design Methodology
 IDES 2101 Perspective and Rendering Techniques
 IDES 2161 Industrial Design Studio 2
 IDES 2151 Product Studies Seminar

IDES 2132 Introduction to Materials Science
 IDES 2142 Mechanics of Solids for Industrial Design
 MATH 2819 Statistics SA

ACCT 1501 Accounting & Financial Management 1A
 GEP General Education Program

Year 2 session 2

IDES 2161 Industrial Design Studio 2
 IDES 2171 Computer Aided Design
 IDES 2151 Product Studies Seminar
 IDES 2193 Applied Ergonomics

MATH 2819 Statistics SA
 IDES 2182 Materials & Manufacturing Processes for Industrial Design A

ACCT 1511 Accounting & Financial Management 1B
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IDES 3221 Industrial Design studio 3
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 IDES 2151 Product Studies Seminar

IDES 3202 Materials & Manufacturing Processes for Industrial Design B
 IDES 3212 Electrical engineering for Industrial Design A

MARK 2021 Marketing Fundamentals
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Year 3 session 2

IDES 3221 Industrial Design Studio 3
 IDES 3271 Form Theory
 IDES 3281 Photography
 IDES 2151 Product Studies Seminar

IDES 3252 Electrical engineering for Industrial Design B
 IDES 3262 Production Design & Technology for Industrial Design

MARK 2042 Consumer Behaviour B
 MARK 2052 Marketing Research
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Year 4 session 1

IDES 4291 Industrial Design Studio 4
 IDES 4301 Project Research
 IDES 4311 Graphic Design for Industrial Designers
 IDES 4321 Environmental & Interior Design for Industrial Designers
 IDES 4331 History of Consumer Products
 IDES 4341 History of Industrial Design
 IDES 4391 Industrial Experience
 IDES 2151 Product Studies Seminar

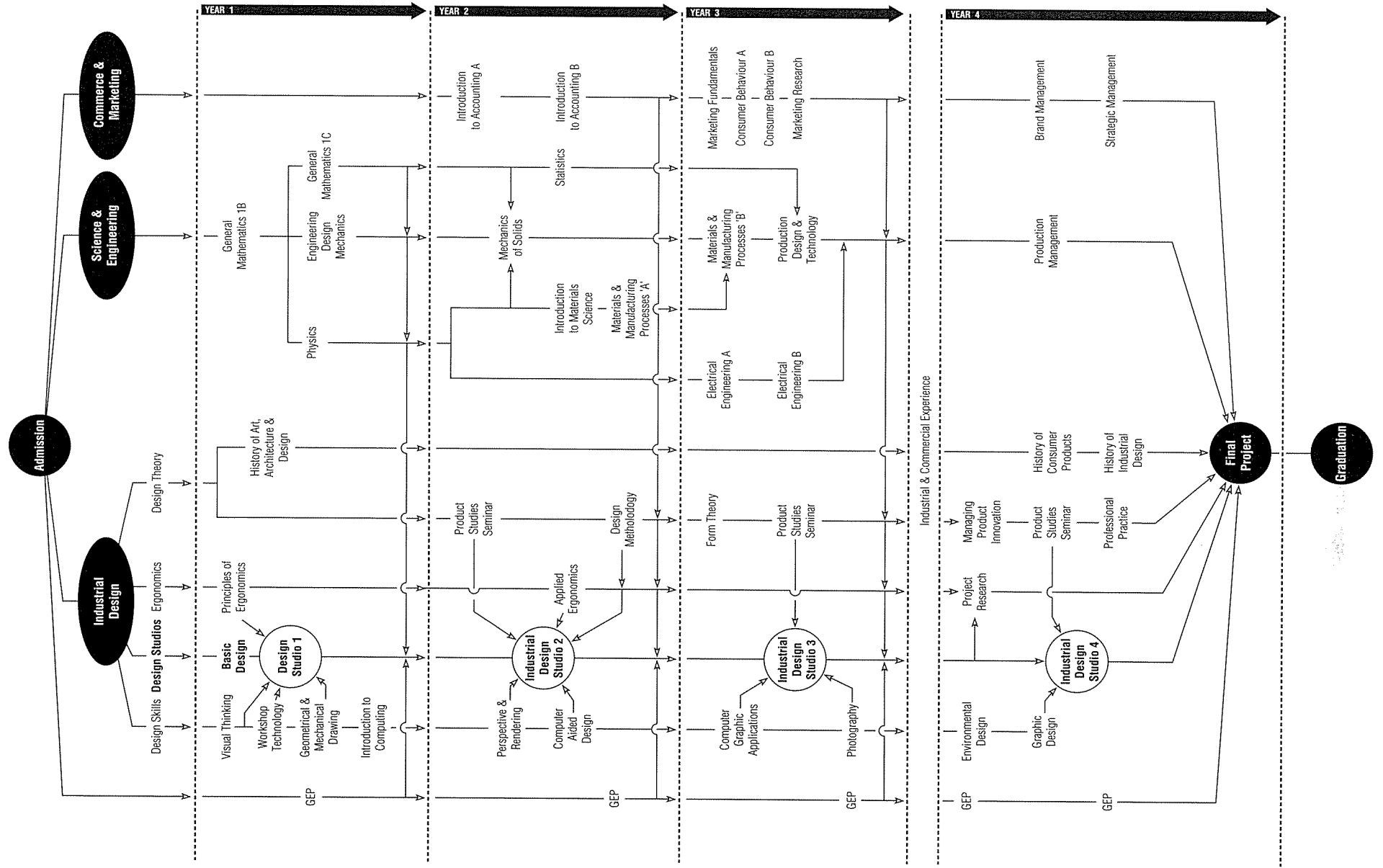
MARK 3073 Brand Management
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Year 4 session 2

IDES 4351 Project
 IDES 4361 Professional Practice
 IDES 4371 Managing Product Innovation and Development
 IDES 2151 Product Studies Seminar

IDES 4382 Production Management for Industrial Design

MARK 3083 Strategic Management
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"Design is vital in capturing a share of the booming markets of the Asia Pacific region".

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These Design industry links illustrate the commercial potential of design innovation.

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