

Department of Industrial Design

Faculty of The Built Environment

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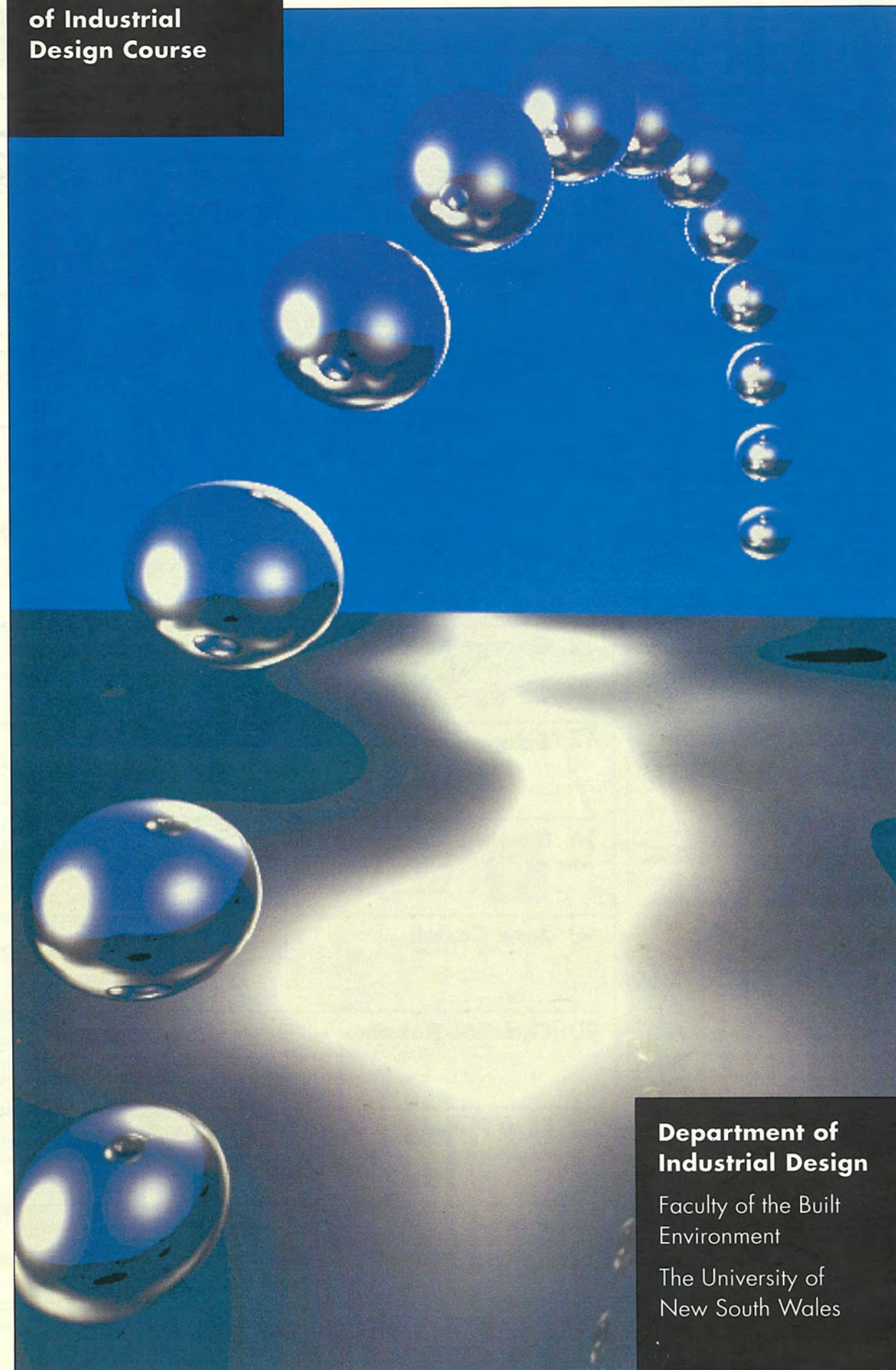
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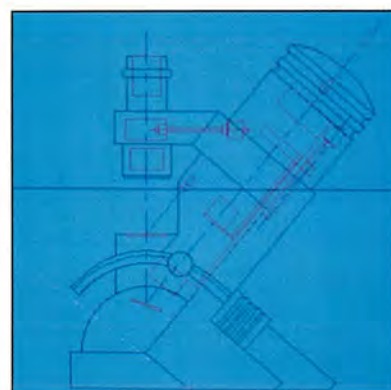
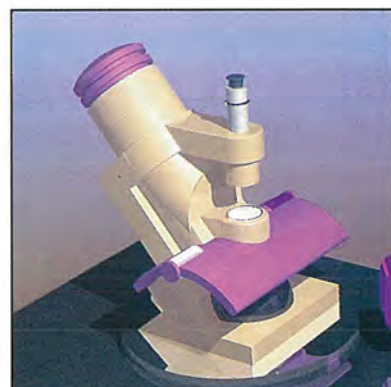
The University of
New South Wales

Iwan Sujono



I share the view of Dr Robert Blaich, former Director of Philips Corporate Design, who said that design, marketing and engineering are three inseparable elements of today's successful business.

As a graduand of the Industrial Design course offered by the University of New South Wales, I have acquired a firm multidisciplinary grounding in design, marketing and engineering which lets me fully understand and appreciate the importance of Dr Blaich's view. Industrial Designers have to be able to effectively communicate with the marketing department, and share any relevant information on markets in which the business operates. In collaboration with the R&D and engineering departments, this information has to be interpreted into technologies and finally products that satisfy established consumer needs and are responsive to particular market requirements. If this kind of effective communication is present, the business will have a chance to break new ground and achieve success. Thus, design, marketing and engineering have to become key elements to secure corporate strategic goals.



Business

The OQA lens quality analyser is used by both optometrists and opticians to analyse the surface quality and power accuracy of both contact lenses and lenses for eye glasses. This products is able to satisfy the unmet needs of a potentially large market. The principle of the OQA was patented under the name of 'Zonometer' in 1983.

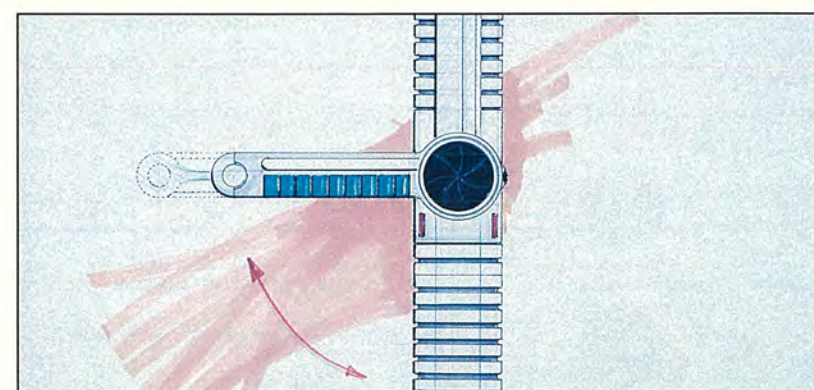
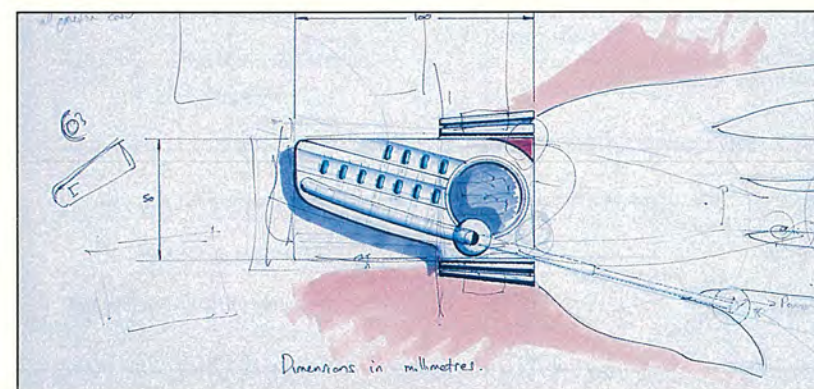
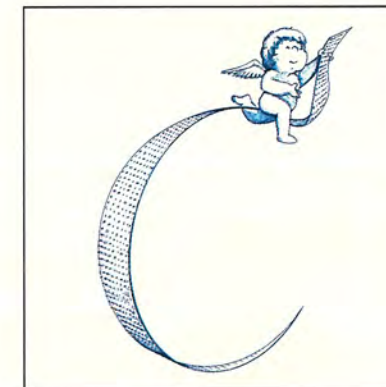
Market research indicates a possible market in Australia of approximately 2,000 units and in Asia and OECD countries of approximately 150,000 units.

The research shows that Sydney-based technology and manufacturing facilities can support the production process at an internationally competitive level. Based on this hypothesis, the project will involve a pre-production investment of approximately \$373,000 and a profit potential of \$4,293,800 in just the first year at a significantly high internal rate of return of 716%.

Acknowledgements

- Arthur Ho, senior project scientist of the CCLRU, for his enthusiasm and advice.
- Aileen Lowe, for her initial research,
- Klaus Ehrmann for his technical support,
- Terry Flinn, for his model making support.

Personal Communicator – 'The Vigilant Cherub'



Virtual communication in the form of storage/retrieval of information (eg voice mailbox, fax memory) is possible through integrating the product with external computers and databases.

Technology applications include rechargeable flexible batteries, the use of a thermoplastic elastomer membrane to pleasantly cushion the skin, and a liquid crystal display exploiting film super twisted nematics with cold fluorescent light, enabling crisp, high-contrast characters.

Business Focus

Sales and profit potential are both of a respectable size, considering both external and internal factors.

There is a growing global trend towards lifestyle oriented 'high touch' products, coupled with increasing consumer willingness to use technology.

A lower product unit cost translates into a greater return on investment; this advantage is derived through simplicity, parts/function consolidation, design for assembly, and value added design.

Risks include the short duration market window and required faster payback period, within a market environment of intense international competition.

Andrew J Gartrell

The marketplace is truly dynamic, competition is increasingly international and highly committed, and much more is being requested of the design practitioner.

Design management encompasses business, marketing, design, engineering, production and administration – truly a technicoloured rug.

As individuals within a team negotiating with these groups, Industrial Designers must be well versed in the skills of communication.

Designers learn how to guide the creation and development of appealing products of true consumer value, along the line of least compromise.

The design 'equation' embraces historical, current, and hypothetical research, conceptual exploration, and follow-through of production. Of significance in the design process are the consideration of the evolving human interface and the fitness of the product for its purpose, ensuring environmental compatibility and profitability, streamlining material construction and product maintenance, and catering for product disposal.

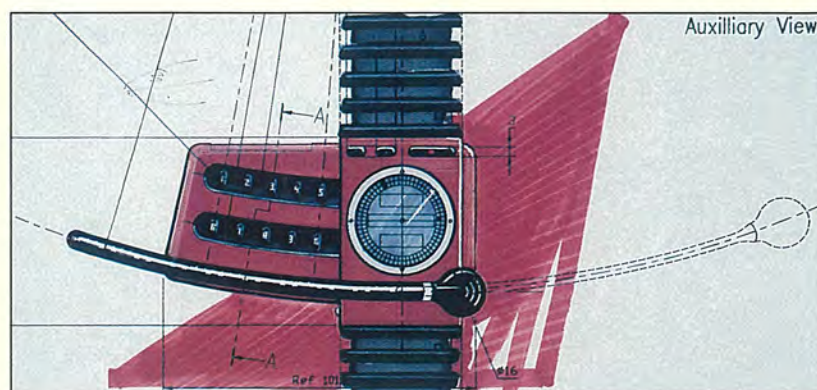


Bottom far left: Rendered colour variation of communicator showing extended earpiece

Bottom left: Communicator in use with extended earpiece cupped between fingers

Top right: 1:1 semifunctional model of communicator

Mid and bottom right: Conceptual renderings generated during initial product development stages



Primary Objective

Create a 'walkabout' private communicator with an emphasis on interface convenience, the natural qualities of human communication and movement, and enhanced user experience. The functions of an analogue time piece and mobile telephone are to be combined.

Market Focus

The largely uncontested market segment of Leisure/Recreation is ripe for such product development strategies. Hypothetical usage scenarios include casually strolling down the local promenade, hand cupped comfortably at the ear; or perhaps sprawled out on a parkside bench immersed in friendly chatter.

Product Focus

To use the communicator, an unobtrusive wrist vibration alerts the user of any incoming calls. To converse, the user extends the flexible aerial along the hand, positioning the speaker through the fingers, then placing the equipped hand as pictured.

GSM (Groupe Speciale Mobile) was selected as the operating system on the basis of convenience, security, and optimisation of an individual's time.



Optical Quality Analyser (OQA)

Design

Throughout the project development process, the application of product semantics was one of the prime considerations. This decision was made on the basis of design-research findings which showed that other instruments in this category do not convey their functions to their users.

The heart of the OQA is a precise and reliable technical package developed by the Cornea & Contact Lens Research Unit (CCLRU) of the University of New South Wales. Its sturdy and well structured case, which is largely made of aluminium silica alloy, offers precision, reliability, and long lasting performance. The housing also provides ample access openings to some inside spaces for maintenance purposes.

Designed so that its desk-contact area is at a minimum, the OQA offers excellent bench saving for most practices. Outside, the housing offers considerable ergonomic advantages, cleanability and appropriate visual appeal.



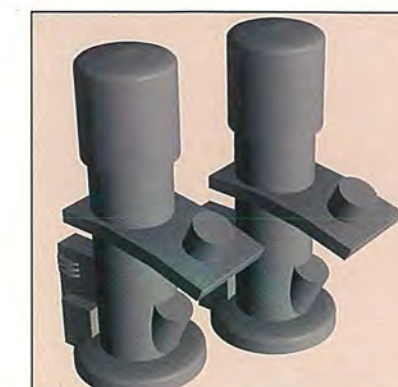
Top left: Exploded illustration showing the arrangement of technical components.

Centre left: CAD-generated illustration of OQA

Below left: Schematic representation of technical package arrangement

Above: 1:1 model.

Below: initial conceptual exploration.



Hendry Sastra

When the University of New South Wales introduced the Industrial Design course back in 1990 I was convinced that this was 'my' course. Now that I have fulfilled most of the course requirements I am glad that I made that decision.

I like the diversity of subjects in the course ranging across design, engineering, commerce and management. Although I must admit it requires a high level of motivation to cope with the workload and to develop skills in this range of subjects.

I really enjoyed the management side of the course especially after I completed the industrial training program in which I worked full time for a health-care company in Sydney for three months. I gained valuable insights and experiences during this program. The program does not solely mean putting theories into practice but also helps to develop self-confidence and professional attitudes.

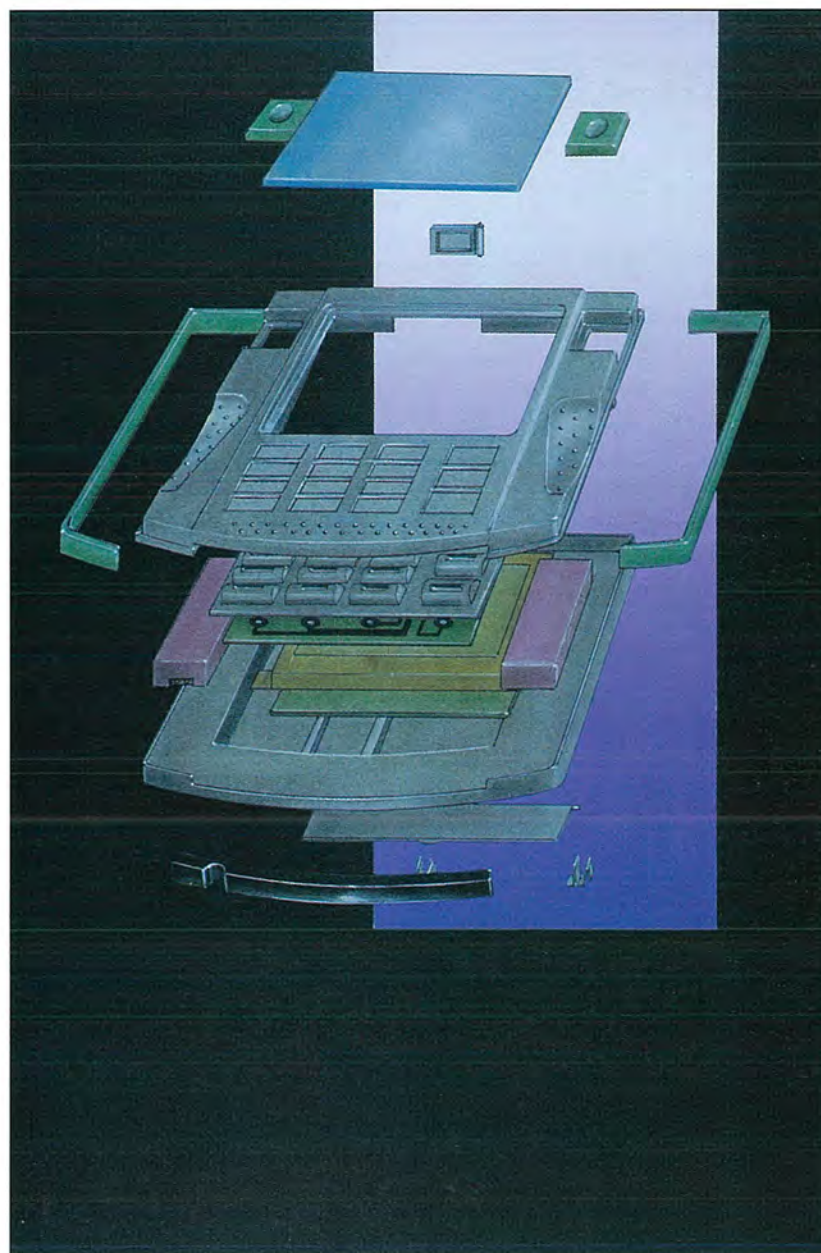
I personally believe that the industrial designer's contributions to a company are very important especially when it comes to maintaining an optimum interaction among the various departments in a company involved in product development.



Bottom left: Exploded drawing showing product components

Top right: Orthogonal views showing external detail

Bottom right: Product in operation



The inherent freedom of a hand-blender or mixer is further enhanced by the battery-powered range that eliminates the constraints of a mains-power cord while fully retaining the required power for food preparation tasks. The appliance can be used at the stove, sink, table or outdoors. Convenience is maintained with a back-up mains-power cord module to ensure that the unit is always available for use.

The Product system

The system offers the following modular variations:

- * the motor unit with the mixing attachment and storage facility
 - * the motor unit with the processing attachment, jug and storage facility
 - * The processing mill attachment
 - * The beating attachment and storage facility
 - * The processing attachment and storage facility
- and only those needed can be bought, reducing wasted storage space of unused appliances, giving the opportunity of broadening the capabilities of the appliance whenever needed.



Left: 1:1 model of motor unit with mixing attachment and battery module

Top: 1:1 model with processing attachment and mixing jug

Below: Exploded rendering of assembly of the parts



Production and business considerations

The modularity of the appliance enables bulk purchase of parts and flexible manufacturing, keeping the cost of manufacture relatively low. Built-in manufacturing considerations such as snap fastenings reduce assembly time and complexity, and facilitate disassembly for repair and recycling.

As a result of savings in the manufacturing cost, the initial investment is reduced. Based on a sales forecast equivalent to current figures with a potential increase in market penetration of 1% per year, a five-year cash flow analysis indicates a favourable rate of return.

Joanne Quinn

Modular Food-Preparation Appliance



I have been fortunate to be one of the first students of the UNSW Bachelor of Industrial Design course, to have received an education that leads to a multidisciplinary approach to design and developed an appreciation of design from a marketing and engineering perspective. The marketing and engineering experience combined with design has instilled a clear focus on consumer expectations to which product performance, cost-effective production and innovation are fine-tuned to ultimately achieve business success. This can be achieved through the full understanding of the benefits of a multidisciplinary team approach to design for global markets.

Introduction

The small electrical appliance market is currently well covered with mixing and food processing appliances. Many products such as the food mixer and hand-held blender have remained largely unchanged since the 1950's after being developed to satisfactorily perform the required food-preparation tasks. Due to its relatively small size, the Australian market is currently dominated by imported appliances and hence is subject to rapid change in product lines and a flood of very similar appliances with little overall development.

Defining the market

An investigation into the market revealed the potential for a product with a stronger user and environmental orientation. The kitchen environment contains dry, wet, hot, and cold areas, and due to the presence of food, hygiene is a critical issue. Storage is an important consideration as is convenience. Many kitchens are cluttered with unused appliances or parts of appliances following the purchase of similar or multi-function appliances. It became apparent that an opportunity exists for a product that incorporates convenience in use and storage, ease of operation and cleaning with a high level of quality and product life.

The Design

In answer to the above criteria, the design evolved to be a modular hand-held food-preparation appliance system consisting of a hand-held blender, hand mixer and processing mill in a mains- or battery-powered range.

The central hand-held motor unit, unlike traditional hand-mixers, has an almost vertical handle to correctly orientate the hand and arm during operation. It may be used as a hand-mixer, with a geared mixing attachment and conventional beaters, a hand blender with processing attachment and a series of blades, or a small processing mill.

Safety is of primary importance, and has been addressed with safety power controls and blade covers to reduce the incidence of accidental operation and eliminate contact with sharp moving parts during use or storage.



Vehicle Information and Diagnostic System

Introduction

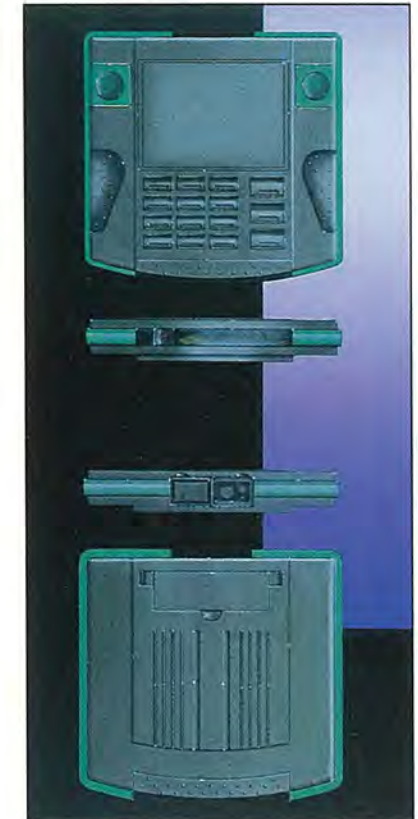
The Vehicle Information and Diagnostic System (VIDS) is a 'bridging' product which enables car users to communicate with the car. The VIDS monitors various systems in a car and is capable of detecting and measuring the severity of faults in these systems before presenting trouble-shooting procedures to the user.

System Interaction

Features in the VIDS help car users and technicians to diagnose and potentially repair faults faster both in emergency and normal maintenance situations. Compatibility with main diagnostic systems means increased convenience. Data can be exchanged to serve maintenance and modification purposes.

Multidisciplinary Product Development

The VIDS was developed in a multidisciplinary project involving marketing, engineering, design, production and economic disciplines. Inputs from these disciplines were reformulated into the product. The result is a product which not only satisfies the market requirements but also meets the business objectives with regard to financial resources and production capabilities.



Business Plan

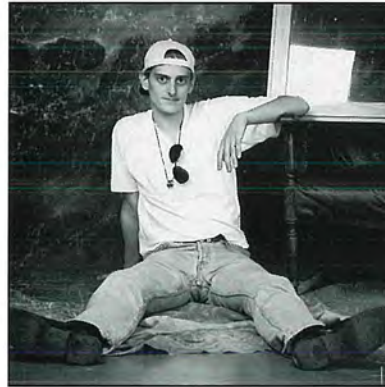
A business plan accompanies the project submission to fully justify the feasibility of the product launch. It contains information on sales and profit potential, cash flow and sensitivity analysis, return on investment and other economic assessments.

The project requires capital investment of A\$562,000. The initial sales of 9,000 units internationally will recover the investment in the first year. Projected sales over a five year period indicates that the VIDS will yield an internal rate of return (IRR) of 288%.

Benjamin Shepherd

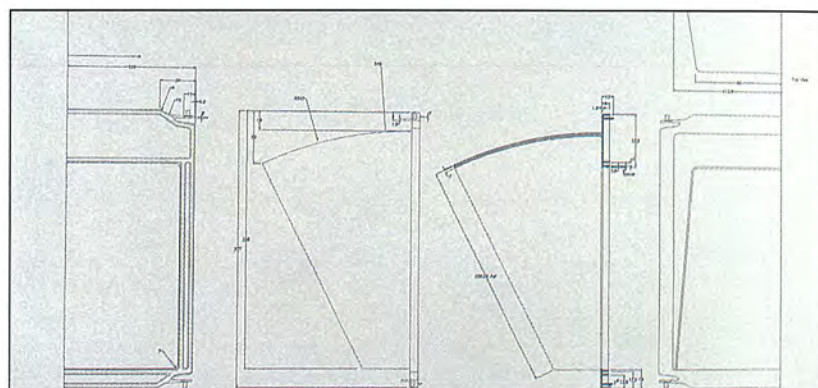
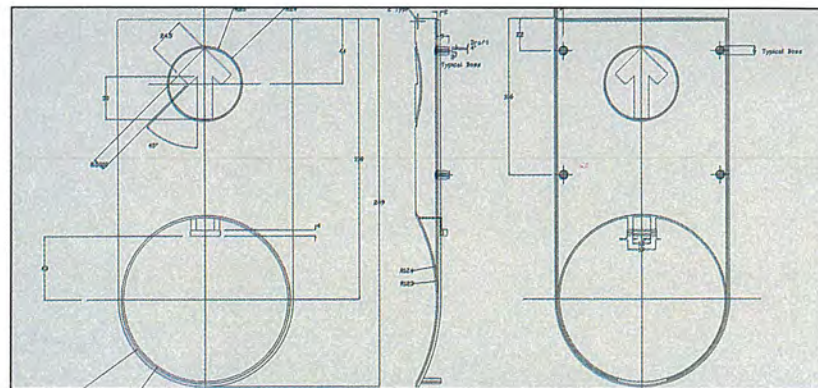
My design work reflects my commitment to producing better products at better costs to better meet changing market needs. I am dedicated to working in partnership with Australian industry to improve Australian manufacturing and its international competitiveness.

I believe that the essence of good design is communication. Communication balances the ability to express ideas with the ability to understand other points of view. The role of a designer lies at the focal point of the product development process and requires a sensitivity to both creative and practical issues as well as a sound understanding of both the technical and commercial languages of business. As a designer must work in tandem with every other discipline in a business environment, he or she must not only be able to communicate with them all, but possess the leadership qualities to effectively manage the team. An industrial designer is a jack of all trades, and a master of ONE.



As a communicator and designer, I see my role as managing the product development process from concept through to profit – from vision to vantage.

Top left: Product before redesign
Mid and bottom left: Technical details of call register and lantern housings
Top right: 1:1 prototype
Mid right: Predicted discounted cash flows over 5 years
Bottom right: Diagrammatic analysis of ergonomic requirements



Modular Food Display System

Cost and investment considerations

The product was developed to be produced by Crest Refrigeration, a small manufacturer of commercial refrigerators, under a limited budget.

Consequently the challenge was to develop the design for production with the client's existing manufacturing resources and minimal investment costs.

Flexibility, both at the production stage and post purchase was identified as an important design consideration to satisfy individual requirements.

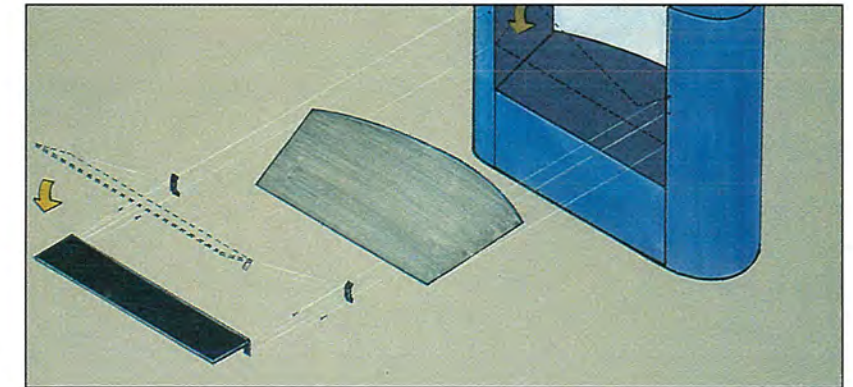
Business Plan

Financial viability of the project was analysed through the completion of a business plan. Results of the business plan indicate that the product will generate positive cash flows for the client, with a complete return on investment after the first year.

Calculated over a five year period, the net present value of the project is \$104700 with an internal rate of return of 180%.

Under a sensitivity analysis, the project proves to be of low risk. Under the worst considered condition the internal rate of return is 83.5% and the net present value is \$40500.

Mid left: Rendered exploded drawing of product assembly
Bottom left: Rendered illustration of rotational shelf system
Top right: Rendered illustration of bagrail/front shelf
Bottom right: 1:1 prototype of Food Display



Elisa Panozzo

The Industrial Design course at the University of New South Wales, in the disciplines of design, commerce and engineering, has equipped me with multi-disciplinary education that enables me to be involved in product development as a designer and project manager.

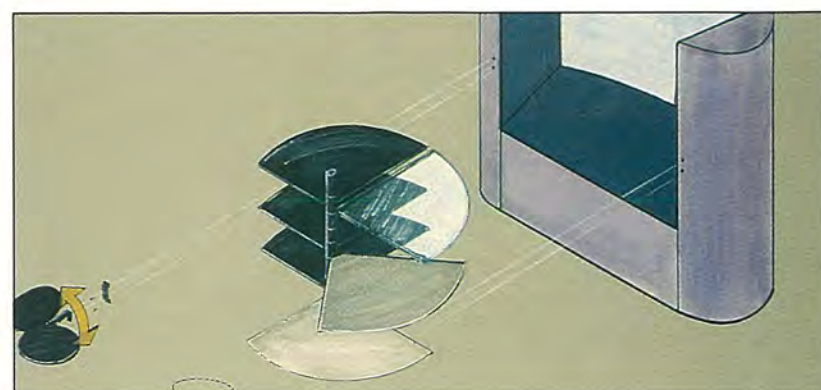
My interests lie in both these avenues as I believe they both have great roles to play in the future of Australian business.

As a designer, the knowledge and skills attained enable me to work and communicate well with others in a multi-disciplinary team as well as developing designs that integrate all relevant product issues.

As project manager, I have developed an understanding and appreciation of the importance of all departments in a company. This will lead to the management of a fully integrated product development process.

With the economic situation we are currently in, the focus must turn to increasing quality in manufacturing for Australian products to compete successfully in world markets.

Quality in manufacturing will be improved by producing well designed products that are the result of a fully focused product development process that is aimed at highly specific markets.



Market Research

The design research and development for this product is aimed at improving currently available products in terms of useability, presentation of merchandise, performance and efficiency of refrigeration specifically with respect to Australian climatic conditions.

These considerations directed the development of a unique design that satisfies a 'niche' market.

Market Need

The modular refrigerated food display is intended for use in coffee shops, restaurants, specialist delicatessens and cake shops.

The system allows curvilinear as well as linear configurations. Individually the cabinets also work well as 'stand alone' units that provide a more 'dramatic' display of food.

Pedestrian Traffic Control System – 'Signalling the Future'

Pedestrian signal lantern

The pedestrian signal lantern product anticipates the needs of traffic authorities into the next century and offers an illuminated signage product suitable for use in various traffic applications, including time-restricted no-right-turn intersections. The product offers its market a unique, low power technology that will ultimately be able to be powered from a local solar energy source. Additionally, the product is both safer and offers lower maintenance than existing products.

This new pedestrian signal operates at lower voltages and eliminates heavy, 240V transformers from the tops of signal poles. At the same time the product costs significantly less to manufacture in terms of raw materials, sourced parts, production processes and labour. The lantern also anticipates changing traffic control technologies and includes a PC board to enable local control and 'intelligent' communication with the master controller.

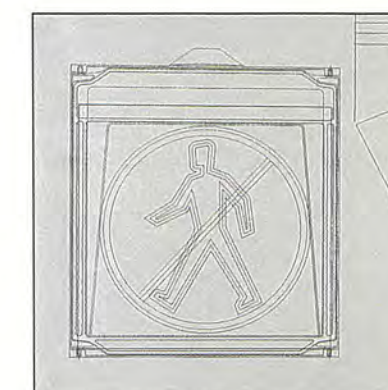
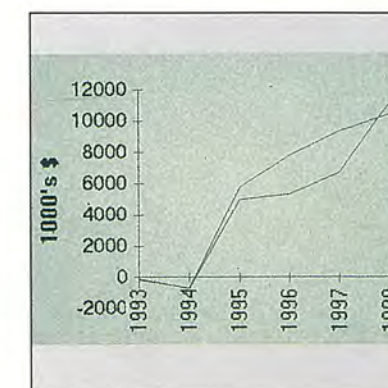
Pedestrian call register

The pedestrian call register device is specifically designed to lead the client's move into the North American market with a high volume, low complexity product. The use of plastic (polyphenylene sulphide) in place of die-cast aluminium greatly reduces part costs and costs associated with weight (such as international freight costs), without sacrificing vandal resistance. Additionally, the switching technology used eliminates all mechanical parts from the device, which also reduces costs while enhancing



reliability and product life-span.

These products offer the client cost reductions of over 50% and 40% respectively over the existing lantern and call register devices. Further, and more importantly, the products dramatically increase the client's potential market share for both product types. Internal rate of return figures developed for the client at the company's standard hurdle rate over 5 years, show a discounted return after amortisation of over 400% for the call register and an astounding 1000% for the signal product! The accompanying graph illustrates predicted Discounted Cash Flows for the two products over the next five years.



Claudia Lee

Medical Workstation



The diversity of subjects I have studied has provided a foundation upon which I intend to continue building as I enter the workforce. I am interested in working in team situations, as I feel, with my broad background of education, my strength is in collaborating with the various disciplines involved in product development. Being at the starting point of my career, my goal is to gain experience in a range of product design activities. I also intend to continue further study into marketing.

Introduction

In Australia, approximately 80% of General Practitioners use computers for general applications (accounting, practice management), while less than 1% use computers for clinical purposes.

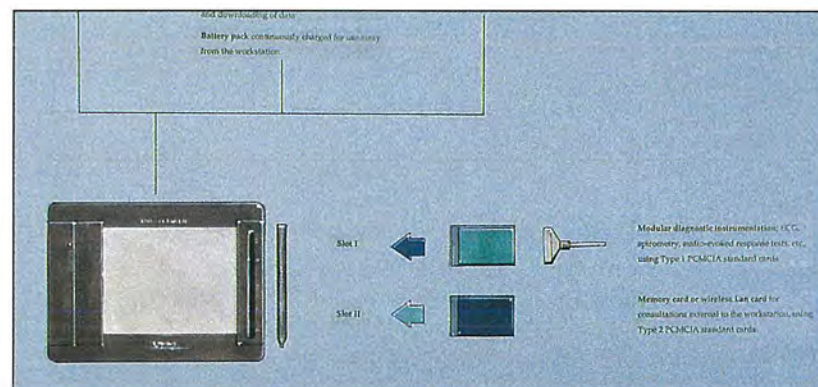
Research shows that the general reluctance by GPs to adopt computer technology is due to a variety of concerns; ethical, political, technological and economical.

The Design Concept

The project therefore focussed on identifying an appropriate package of technology for the GP to overcome these concerns, as well as the design of a working space which would integrate the use of the technology without inhibiting the quality of

communication between doctor and patient.

A PC based, modular instrumentation and communications system is presently being developed by the Biomedical Systems Laboratory, a research and development group led by Professor Branko Celler at UNSW, using PCMCIA card technologies. The stand-alone system integrates communications, clinical measurement and clinical decision support into a portable and efficient 'package' of technology specifically tailored for the GP. An important feature is the involvement of the patient in the consultation process to ensure information is interpreted and recorded accurately.



Top left: System detail

Bottom left: Perspective view of workstation

Top right: Rendered front view of workstation

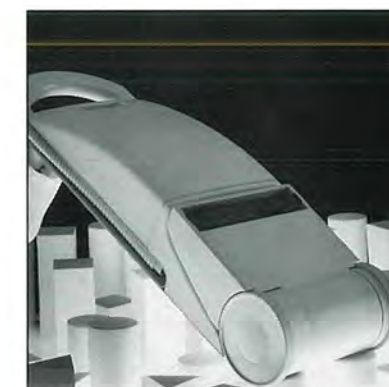
Bottom right: Diagrammatic analysis of ergonomic requirements



Through the use of a more efficient technical package, 'Spring Clean' will have high cleaning efficiency performance making it an attractive alternative to low wattage barrel cleaners and superior to battery-powered handheld vacuum cleaners.

The Cost Effectiveness Ratio (a measure of the value for money offered by the product) is relatively high. This implies that the product will be competitively priced while maintaining a healthy profit margin due to cost effective production.

The cleaner's relatively light weight, the absence of a troublesome cord, and a handle designed to overcome wrist fatigue, all contribute to create an ergonomically sound product.



Left: Vacuum cleaner in recharging console

Top right: 1:1 model with extended handle and unfolded powered beater bar head

Mid right: Vacuum cleaner in compacted storage arrangement

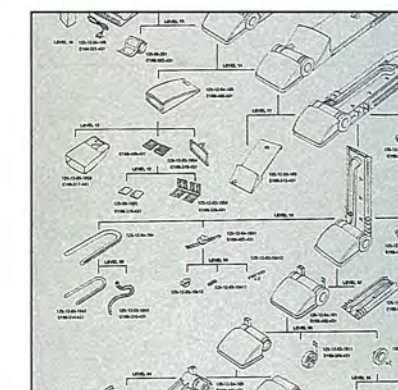
Bottom right: Exploded drawing showing planned levels of assembly

The advantage

Given the product's features and the size of the potential market, estimated at approximately 11,000 units per annum (for local markets only), its sales outlook is promising. A marketing strategy including a profitable pricing strategy, promotional strategies that increase consumer awareness and demand and a thorough distribution strategy has been established in order to fulfil sales expectations.

The calculated Return on Investment and Internal Rate of Return show that given a hurdle rate of approximately 20 per cent, the product will be returning profits within the first 2 years.

For the client (Hoover Australia Pty Ltd), the profitability of this product is unquestionable, especially considering the company's reputation in the floor care market. 'Spring Clean' will reinforce the company's position as a market leader in the upright cleaner market and provide the opportunity to enhance the company's image as a product innovator.



Christine Ruhotas

Australia's manufacturing industry has suffered for over a decade as investors chose to direct their funds into what appeared to be more profitable ventures. The result of this move away from investment in manufacturing is an economy that is lacking in strong secondary industries and the social, economic and financial benefits that a healthy manufacturing environment facilitates.

The future for Australian manufacturers is currently looking more promising. Internationally, Australian manufactured products are being recognised and Australian manufacturers are aiming for global as well as local markets.

I see the role of an Industrial Designer within a company as a pivotal one. Good product design, when successfully implemented by a company, may constitute a prime sustainable competitive advantage. This means that the company as a whole must work towards good design as a corporate goal.

I believe that the Industrial Designer is a facilitator or catalyst. The Designer must possess the skills to co-ordinate the departments within a company and to ensure that cooperation and communication exists.

Having studied subjects pertaining to marketing, production, research and development, finance and management, I am confident that, as a graduate of the UNSW Industrial Design course, I am well prepared to work in any Australian manufacturing organisation.

Battery powered upright vacuum cleaner – 'Spring Clean'



In the long term, successful manufacturers will have recognised the importance of product design to their strategic agenda. If Australia is to improve its position in global markets, we will need to encourage and support innovation and technology and the people who have the skills and knowledge to create and employ these tools.



The vision

Technological advances continue to change our lifestyles. Time is seen as an increasingly precious commodity, thus creating strong demand for convenient, time saving products.

Lap top computers and microwave ovens are two examples of the products currently being designed and produced to satisfy consumers' demand for convenience.

This trend toward convenience has been most noticeable in the home.

The development of a battery powered, upright style vacuum cleaner, 'Spring Clean', was initiated in response to the consumers' need for a convenient, 'quick access' floorcare appliance.

The market

It is envisaged that 'Spring Clean' will satisfy the needs of most consumers in the floorcare market. The target markets include a range of consumers from those living in small dwellings to larger family homes where the product could be complementary to an existing floorcare system.

The product has significant potential for use in commercial markets as well, especially in the hotel and restaurant industries.

The product

'Spring Clean' has been developed employing the latest in nickel metal hydride and lithium ion battery technology.

The choice of materials for the design has been made with the issues of disassembly and recyclability in mind.

The Design Solution

The main challenge was to translate the objectives of the technical concept into the GP's working environment, while focussing on communication between doctor and patient, and without compromising useability for both doctor and patient. The essence of the work area was defined, resulting in a basic workstation layout.

Aside from the important issues identified from ergonomics, market, standards and semantics research, it was critical that the development of the product would match the commercial objectives of FSA, a Sydney-based office furniture manufacturer.

Other markets

Other markets were identified for the basic workstation (banking institutions, fitness evaluation centres) and a business plan for the project was created.

The concept of modularity was an essential element for two reasons. First, in terms of meeting the needs of the individual users and environments of use. Then, there is the commercial necessity to market a complete workstation system rather than isolated pieces of furniture.

A modular, soft-wired system which is wall-mounted, maximises efficient use of a typically limited space. The basic workstation is the core of the concept and the modularity concept builds on its structural elements: the power and structural beam and supporting brackets.

The circular, height-adjustable worksurface, turns to allow the doctor to conveniently position the Fujitsu POQET 325Point



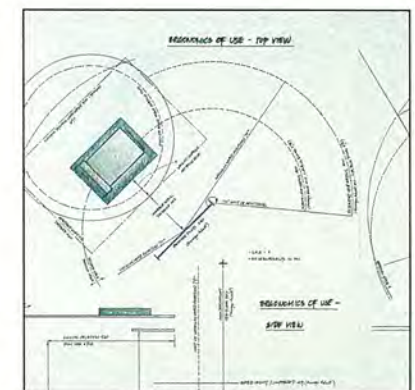
pen-based computer for data entry and for use in diagnosing the patient at the workstation. A braking mechanism is used to lock the worksurface in place when rotation is not required.

The display screen on an extendable arm is primarily for use by the patient for confirming information being recorded, as a visual aid in the communication of information, and as a touch screen for responding to various diagnostic tests.

The circular seating arrangement gives doctor and patient choice in seating positions while being convenient for the doctor to move when examination of the patient is required.

The product

A workstation designed for General Practitioners, focusing on improving the quality of the



doctor patient relationship. The inclusion of computer technology in the workstation provides the doctor with an efficient clinical tool for the gathering, measurement and recording of patient information, so focusing attention towards the needs and concerns of the patient.

Helen Zylberberg

Australian design and manufacturing have been hampered by a lack of 'global vision' – both within local markets and the international community. Much of this can be attributed to the relative size of the national market. Nevertheless, there is great potential for future developments. Of prime importance to such developments is the need for a continuous broadening of the base of knowledge that may be applied to a focused design process.

I believe that the course offered by the University of New South Wales is an effective step in that direction. Our education rests on a tripod of knowledge and skills – design, commerce and engineering. Each of these legs is required for the whole to stand firmly, and specialisation can only succeed where an understanding of the greater whole exists.

I see my particular strengths leaning towards the area of total product development management. However, I feel it is important to remain familiar with design principles, and close to all aspects of the design process.

Cardiac Ambulatory Monitor



Introduction

Cardiac Ambulatory Monitoring (or Holter Monitoring) is an effective method for gathering and recording cardiac information for diagnostic purposes and for the successful rehabilitation of post-operative cardiac patients.

Technology

The design proposal successfully combines two well established technologies – namely biomedical engineering and mobile telecommunications. This product forms part of a computer based medical data acquisition system under development by Associate Professor Branko Celler, School of Electrical Engineering (UNSW). The technical package makes use of the growing tele-communications industry and particularly cellular

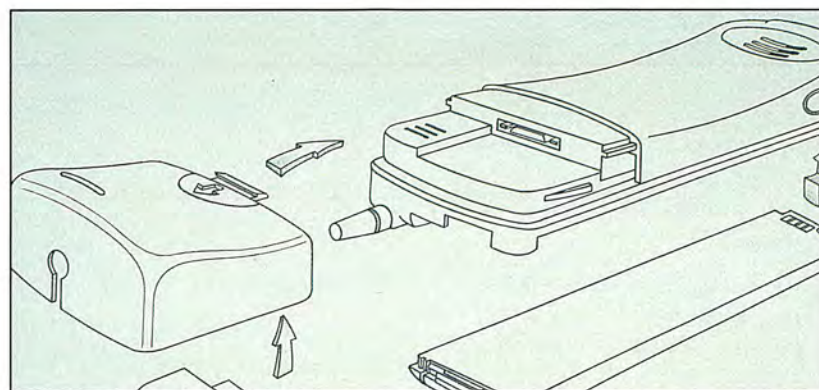
network technology, and combines this knowledge with the newly emerging PCMCIA ('Personal Computer Memory Card Industry Association') Card Standard. Hence a cardiac monitor has been created which is completely mobile and contains a reprogrammable card.

Product performance

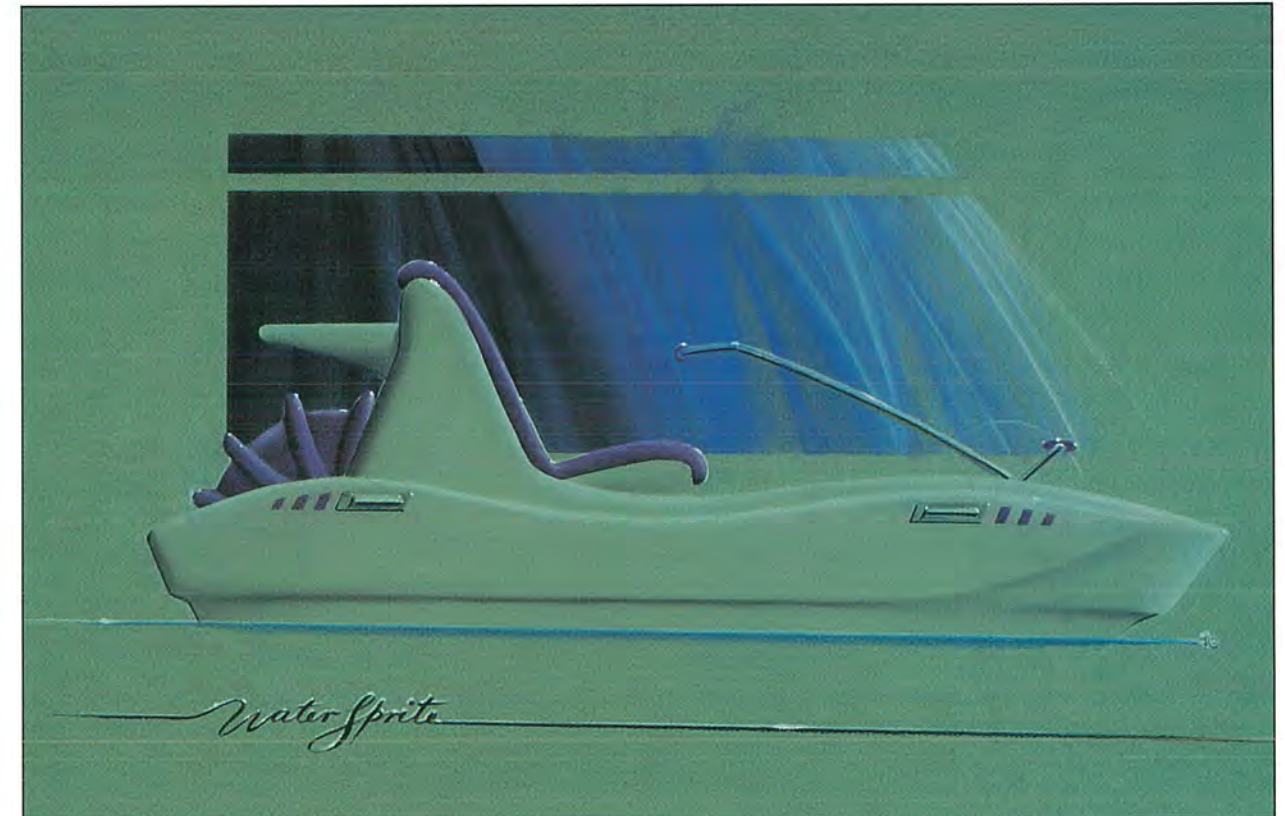
The device provides superior collection and analysis of data, and has a dual purpose operation. It not only sends data via the existing cellular network, but also allows communication back to the patient. The advantages of cordless telephony over current systems include long term data recording and automatic transmission, low power consumption and low operating costs. In this way, actual patient-doctor contact time is reduced, thus lowering overall costs, and allowing the patient to be more independent, and play an active role in recovery.

Cost benefits to the community

The government health system will save money with this device, as patients may be treated and rehabilitated more rapidly and effectively. Doctors will be able



Resort Water Vehicle – 'Water Sprite'

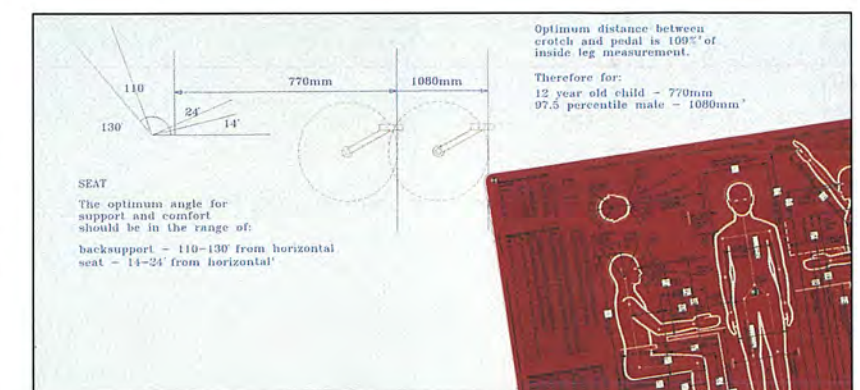
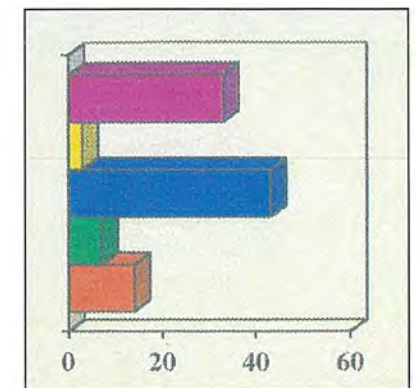


Comfort was of great importance and ergonomic analysis was utilised to ensure that the seating position is both comfortable and provides necessary support.

An innovative feature for this type of craft is the adjustability of pedal positions which allows variously sized people to use the craft both effectively and in comfort. The range of sizes covers a twelve year old child to an adult man (approx heights: 1500–1900mm).

Whilst pedal-crafts of various forms have been around since the 1800s, an aim of the Water Sprite has been to make 'messing about on the water' fun and easy for all ages, without the need for special knowledge or equipment. The Water Sprite's ability to be linked to other Sprites enables a family or group of friends to use 'one' vehicle, or the Sprites can

be easily disengaged to provide craft for individuals to race. This feature will not only broaden the Water Sprite's appeal to its users, but will also enhance its revenue potential to resort managers.



Jane Castell

Studying Industrial Design has been an absorbing and enlightening task.

Design is a prime corporate tool for successful product development, however I feel that it cannot be used in isolation and needs to be combined with marketing and engineering. It is this integrative process which the UNSW Industrial Design course emphasises.



As a mature age student I wanted a course that did not concern itself only with form, but also paid attention to the detail and the not so glamorous nuts-and-bolts aspects of design development. At times this was nearly my undoing, as my brain tried to integrate engineering equations with marketing concepts, whilst trying to ensure an aesthetically pleasing design. However, ultimately these are all essential elements that are part of total product development that aims at market success.

A 'good' design for the nineties is not only good to look at, but 'good' to use, cost-effective to manufacture, easy to market, environmentally sympathetic as well as profitable. Whilst it may seem obvious that design should encompass all those points, it seems that until now, the

marketer's or engineer's point of view has been quite different from that of the designer. This course has ensured that as a designer I now have the tools with which to speak to marketers, engineers and accountants in their own languages, and can more easily comprehend their problems and priorities.

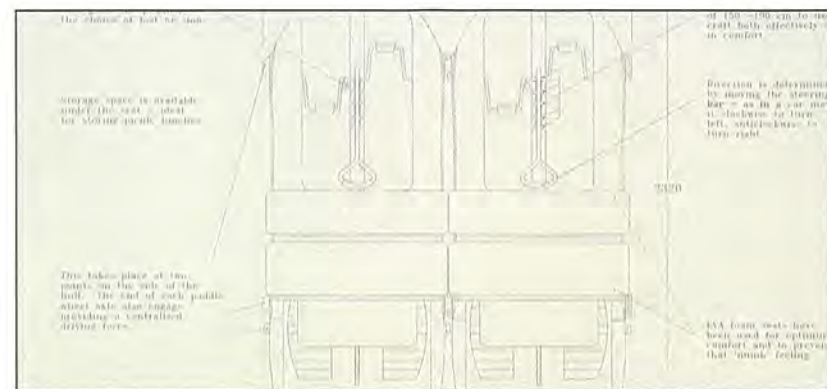
This improved communication between commercial, technical and design areas is a tool that will enable more efficient design processes to be utilised which in turn will result in superior products, not only in design, but in profitability. For me, it is the management and understanding of all these facets that makes design both challenging and rewarding.

Left: Technical details of two linked watercrafts

Top right: 1:1 rendering of Water Vehicle

Mid right: Distribution of cost

Bottom right: Ergonomic analysis of adjustable pedal positions



The Water Sprite project combines all the aspects of design, manufacture and commerce which have been the focus of the Bachelor of Industrial Design. The project, which was initiated by Seawind Catamarans, was to fill a gap in the non-motorised resort watercraft market. So from the beginning the product was aimed at filling an unmet need in the marketplace.

The markets for Water Sprites are often remote locations and/or are overseas, therefore maintenance has to be able to be carried out with the minimum of equipment and materials. So whilst the latest developments in plastics and moulding technology are utilised in manufacturing, the interface presented to those managing the craft has to be very low-tech.

It was essential that the Sprite be designed as a viable product in a competitive marketplace, this meant it must be made with the minimum person-hours, appropriate materials and incorporating a minimum of specialty components. To achieve this a business plan was an essential part of the total design process, detailing the costs involved and how a realistic return on investment can be achieved.

to dedicate more time to analysis of data and detailed diagnoses with superior equipment, and the patient will receive better treatment for illnesses which were once difficult to recognise.

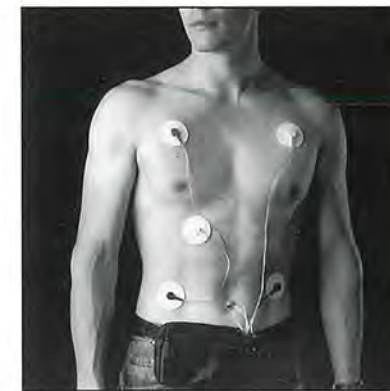
Cost benefits to the medical practitioner

With current systems costing upwards of \$17,000 to install, and \$11,000 per monitor, the proposed device offers superior benefits at a very low and competitive price of \$4,900. The low price of the monitor and savings made through the use of rechargeable battery technology, will offset the added cost for doctors/institutions having to subscribe to the cellular network and be linked into the base station plan. A proposed cost of \$3,500 will cover subscription fees and software compatibility with existing systems. The PC Card is removable, so the monitors may be upgraded with improvements in technology – thus extending the life of the product.

Business plan

This design proposal makes use of some existing parts of the Nokia Mobile Phone to keep investment and part costs to a minimum. The product is expected to require a three year research and development and pre-production period (including 1993). The market launch is planned for the end of the third year, following full testing and approval by the Therapeutic Goods Administration.

The financial analysis of the project has been divided into two business plans. One covers the development of the monitors and accessories, and the other covers



the development of software and base station installations. The monitor requires \$959,000 capital investment, and being a high value added product, costs are recovered almost immediately, with an estimated nett profit of over \$600,000 in the first year. For the computer software to be developed and base stations established with supporting infra-structures in each state, capital investment of \$4,007,000 is required. The payback period is two and a quarter years on this investment, based on the Australian market only.

An initial product run of 5,000 units has been proposed to satisfy the Australian market in both the private and public sectors.

Bottom left: Exploded drawing of assembly of the parts

Top right: 1:1 model of cardiac monitor

Above left: Placement of electrodes on patient

Above right: Monitor removed from bag to answer incoming doctor's call

George Kourtesis

Looking at some of the most successful products in recent years such as the Sony Walkman™, one quickly realises that success can be achieved with careful attention to marketing, production, engineering, and design.

All these aspects have to be integrated in order to achieve a totally responsive product that addresses highly specific consumer needs.

The Walkman did not require any new technological innovation yet it made an impact, not just in market penetration, but in changing people's lifestyles as well. This is a result of the application of total design management.

Design management is concerned with achieving optimal solutions to problems by integrating marketing, engineering, ergonomics, production, and design. Only by co-ordinating these areas of expertise can successful solutions be achieved.

As a graduating Industrial Designer from the UNSW course I now possess the knowledge and skills necessary to communicate with marketers as well as engineers and other designers. I feel ready to coordinate the team effort and to manage the



complete product development process, from 'we need a new product.' to that product's actual sale and distribution.

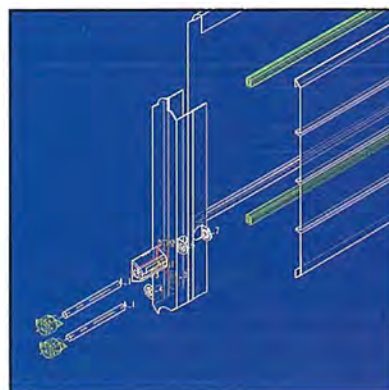
Below left: Exploded part assembly of sectional door panel

Below: Exploded CAD-rendering of Remote Control assembly

Below right: Remote Control fully assembled

Below far right: Value Analysis charts used during product development

Top right: CAD generated perspective of Louvre Sectional Door and Remote Control



The brief

What do you do when you have an undifferentiated product that has been around since the last World War, your competitors have recently put themselves in a position to strip your market, and you are unable to penetrate lucrative international markets? B&D have decided to develop a new product.

The Louvre Sectional Door has been developed in the light of anticipated needs and desires of current consumers, utilising today's manufacturing techniques. The result is a highly innovative product for a competitive price.

The market

The urban sprawl continues unabated. One of the results that can be observed is the disappearance of the family-home on a quarter acre block, forcing many people to live closer together than ever before. This has many implications in society in general, not least the value placed on space. The Louvre Door has been designed to meet this increasing market trend, to satisfy the need of people who are using their garages for activities other than simply parking the car. These activities could include anything

Project Objective

The objective of the project was to create a product that is responsive to consumers' needs and wants, takes an ecological approach to lawn mower technology and design and explores the economic viability of the addition of the ECOS to the Victa product line.

Marketing

A marketing strategy was established in terms of market position and penetration, promotion and price. This involved a customer features analysis, current market analysis, SWOT analysis and a review of the market trends. In brief, the marketing strategy developed into targetting a mass market that includes younger people, females, and the traditional market.

Technology

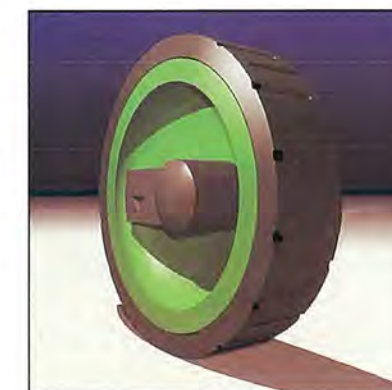
The Victa ECOS combines electrical and solar-rechargeable battery technology with improved ergonomics to create a product with high user friendliness and environmentally conscious performance. It incorporates a dual system, with interchangeable catching and mulching modes. It is potentially the safest lawn mower on the market due to features such as the safety key, 'dead man's' handle and polyurethane blades. Apart from being rechargeable via solar panels, the mower can be recharged through a standard power outlet.

Price Competitiveness

An analysis of existing Victa lawn mowers as well as that of competitors, led to an 11% reduction in manufacturing cost



in comparison to current product lines. The ECOS performs approximately 50% more favourably than competitors' products with respect to the customer features performance over cost. This result is due to a 20% increase in feature performance with the 11% reduction in cost.



Investment Plan

The investment plan is forecast over 5 years and involves weighing up the total investment in the project against net profit, taking into account market penetration, manufacturing cost, amortisation, tax payable and sales margins. Assuming an investment hurdle rate of 30%, a Return on Investment of 2.72 after 5 years is predicted, with a pay back period of 1.34 years and Net present Value of \$2,100,000. The internal rate of return is calculated at 55.9, indicating that the project shows a potentially high positive cash flow.

Left: Initial renderings generated during concept development

Top right: 1:1 model of mower

Mid right: Mower with catcher and handle

Bottom right: CAD rendering of mower wheel with integrated height adjustment lever

Monty Riggs

Solar Rechargeable Lawn Mower

Our emphasis today is increasingly on the quality of life. The theme is 'Not more – but better'. We seek value, durability, responsibility and safety in the products we buy. Our growing concern for the environment and our discontent with pollution and resource waste are leading to significant changes in our lifestyles. These days our products must harmonise with their natural environment as opposed to conflicting with it. This dictates an environmental and ecological approach to product development.

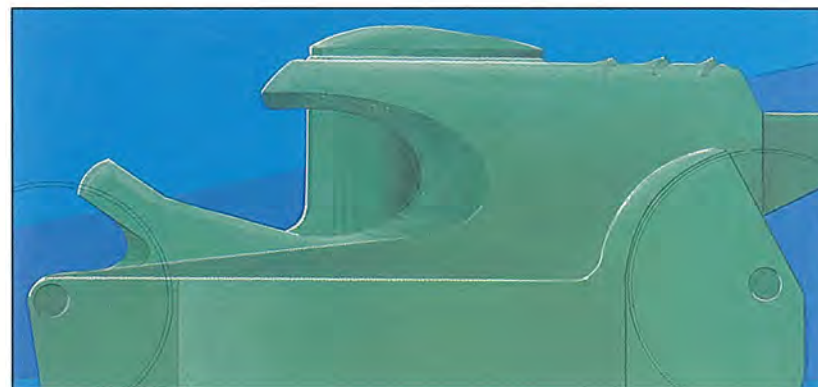
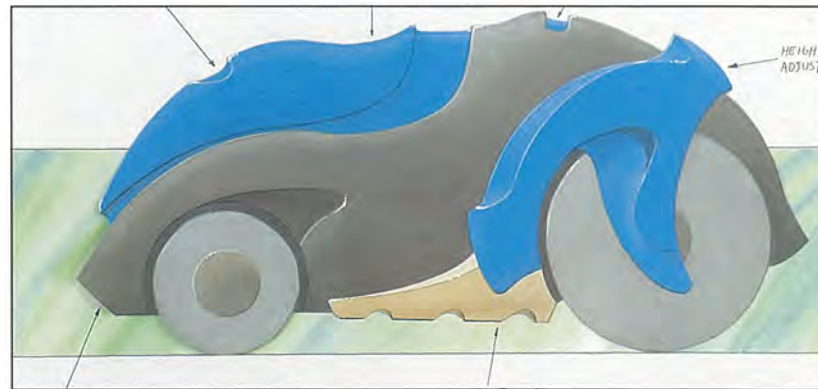
Appropriate application of the disciplines within Industrial Design such as Marketing, Engineering, Manufacturing and Investment Planning, means students are learning not only to create better products but also to make products profitable business propositions.

In its focus on the integration of Management, Marketing, Manufacturing and Engineering, I feel the course of Industrial Design at UNSW is reflective of how the profession is developing. Today's Industrial Designer must be a central figure in an organisation, relating to all levels of operation. The Designer, as a project manager, becomes the link by which other disciplines in a company communicate, as well as maintaining a consistent product philosophy throughout a product's development.



Introduction

The Victa *ECOS* is a battery powered, domestic lawn mower developed in conjunction with Victa, aiming to resolve both economical as well as ecological design issues. The project was initiated following legislative moves within the industry, as well as through the introduction of competitors products, threatening Victa's market share. Research was conducted in the areas of Value Analysis, Marketing, Ergonomics, Technology and Product Semantics. The *ECOS* is to represent a new generation of lawn mowers for Australian and International markets.



Louvre Sectional Door and Remote Control

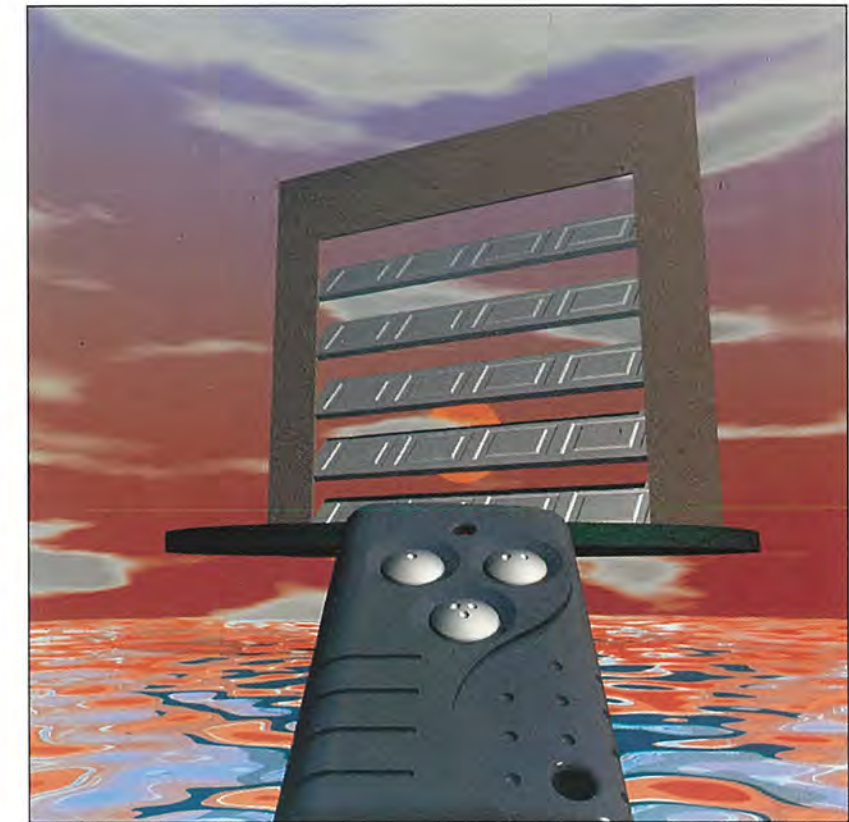
from leisure such as table tennis, or work and chores such as painting or polishing. There is a need to open up the garage to the outside world, without sacrificing security.

The Louvre Door fills a niche in the high end of the garage door market. It attracts consumers who desire something more than just simply a door to seal off the garage from the outside world. There is an expectation of something that will more readily complement their house, thereby adding value to the home. Something that the owners will take pride in.

The product

The choice of materials and manufacturing methods for the design has utilised B&D's expertise in these fields to the fullest, with additional issues such as disassembly and recyclability in mind.

Care has been given to the safety aspects, neutralising the 'finger-jam' problem of the past, and the exclusion of sharp edges to eliminate the possibility of people cutting themselves. An effort has been made to make the door quieter in operation as well as during strong wind conditions. Attention has also been focused on insuring a faster installation



time, using fewer components.

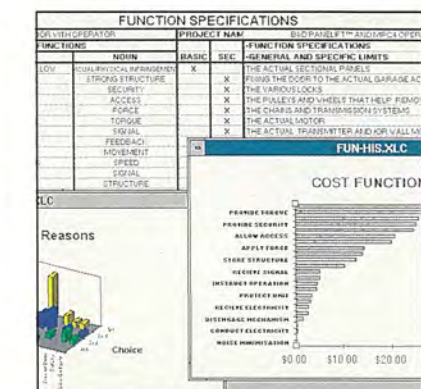
The cost effectiveness of the product (value for money) is high. This is the result of addressing some of the shortcomings of existing products, such as safety and cost effective production, and by adding functionality not found in any other comparable designs to date. The result, is a competitive differentiated product.

The vantage

The size of the market in Australia is approximately 14,000 units per annum with B&D currently producing 10,000 doors. The market is growing and potentially lucrative. Given the product's features, its sales potential is promising. The US market is particularly attractive. The strategy for this market includes profitable pricing as

well as highly focussed promotional and distribution activities.

For the client B&D Australia, the Louvre Door will do much to strengthen its position in the market place both here and abroad, for the first time differentiating the company from the competition, and reinforcing its position as a market leader and innovator.



Selena Griffith

Miners' Helmet and Communicator



I was attracted to Industrial Design as a field of study for the broad range of subjects it offered. During the course of my studies I have been able to develop insight into many varied fields which include Mechanical, Electrical and Materials Engineering, Graphic Design, Marketing, Research, Manufacturing, History and Management.

In the light of the broad education I have received, I feel that as an Industrial Designer, I will be able to effectively communicate with people from many areas of expertise, and in fact draw people from other disciplines together as part of the design process.

I believe it is important for a Designer to be able to work both as an individual and as a member of a group. In the group scenario, the Designer should be a catalyst for creativity whilst retaining a sense of reality. The Designer should be flexible and show an ability to facilitate the development of products from conception to inception.

The role of the Industrial Designer of the future will be one of social and environmental responsibility. This is an exciting challenge to which I shall look forward with enthusiasm.

The Client

My project was to design head protection for miners, undertaken with Mine Site Technologies (MST). MST is a Sydney-based Australian company, which was established in 1985 for the development and commercialisation of products and processes for the resource and industrial sectors.

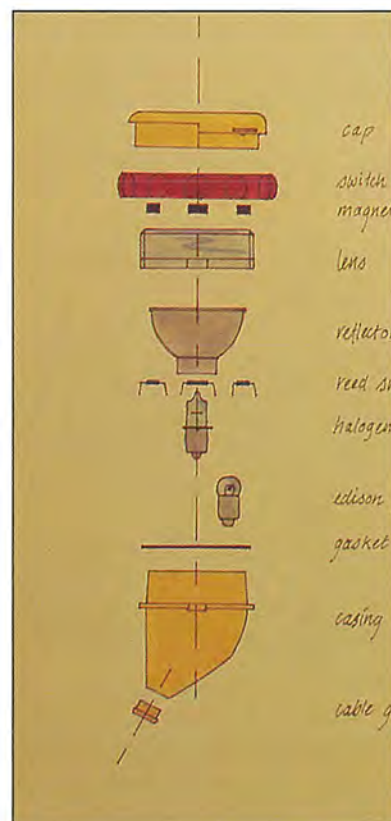
The Brief

MST had identified a need for an improved form of head protection for miners. After discussions with MST, I undertook a thorough study of head protection and related products. From user research I ascertained that there was a need for a lighter weight helmet / lamp unit which was well ventilated, easy to adjust and attractive. The unit also needed to accommodate all head sizes whilst remaining comfortable. Another important consideration was for the Miners' Helmet to be reliable even in the extreme situations encountered underground.

Innovation

The risk of potentially explosive environments in underground mines meant that the design of the lamp, which is incorporated into the Miners' Helmet, needed to prevent any gases entering it. In order to achieve this, internally mounted reed switches were utilised in the technical package to facilitate contactless external switching.

Most helmet users complained about the weight of their headgear. By integrating the helmet and lamp it was possible to substantially reduce the weight of the entire unit. The weight reduction will be an advantage



Above: Detail of lamp assembly
Below: Detail of cable connector
Top right: Miners' helmet in use
Mid right: Helmet with integrated communication system
Bottom right: Rendered front and side view of helmet



in the future to offset the mounting of the communication system to the helmet.

Most existing helmets have 'universal' fixing points on which hearing protection and visors may be mounted. This feature has been retained in the Miners' Helmet so that the existing and future specialist attachments, such as an integrated communications system, may be used with it.

The Miners' Helmet allows easier recharging of the batteries than in its predecessors. Rather than recharging through the cap lamp, the cable and battery may be unplugged from the helmet for recharging or replacing of the battery. This also gives the added advantage of saving space in recharging rooms.

Design Detail

The Miners' Helmet is aimed to be used in conjunction with another MST product, the PED Communication system. As such it needs to be visually compatible with the existing MST corporate product design approach. This has been achieved by the use of colours and textures which are similar to their existing products. The colours were also selected to provide maximum visibility to the wearer and allow the

application of reflective tape and other personal identification devices. Bright rich colours and textures were applied to interface surfaces, such as control switches, the texture to prevent slipping when using the controls, and the colour to identify the part as a control.

The world wide potential market for the Miners' Helmet is well in excess of 17 million units. The



helmets and their components could be produced under licence in other countries to service local markets and take advantage of existing distribution networks. Initially the Miners' Helmet would be launched in Australia.

The market for the Miners' Helmet is not limited to the mining industry. There is potential for the product to be used in construction, maintenance and tunnelling occupations which require remote communications or are difficult to illuminate. There is also the possibility for use in activities such as caving and exploration.

The Miners' Helmet is a product that will help to improve the working conditions of its users and maximise their personal protection.