They're growing

With 68000 and Unix, L & L Australia's Unison is a high-performance supermicro. Tony Smith and Mike Clarke describe the birth of a new machine . . .

NESTLING at the foot of Mt Dandenong in Kilsyth is a low-profile brick and smoked-glass plant that looks as if it has come straight from Silicon Valley, California. This is the new home of L & L Australia Pty Ltd.

The showpiece factory produces a range of high-technology devices used in the petroleum supply industry, and the progression from these microprocessor-controlled products to a stand-alone supermicro was the natural direction for the company to take. In October, 1982, the decision to build the Unison, which uses the 68000 microprocessor and Unix operating system, was taken. We visited the factory in July and obtained this preview as production models of the Unison were becoming available.

The choice of the 68000 microprocessor and the Unix operating system puts the Unison in a market where there are very few competitors. The processing power of the 68000 and the Siromath Pty. Ltd-supported Sironix, an enhanced Unix version 7, makes this a front runner against which other 68000 systems will be measured.

The choice of Unix makes the universities, technical schools and high schools obvious customers, as Unix and C are almost universally accepted as excellent computer education and system development tools. L & L's record in the petroleum industry will obviously give it a vertical market with applications packages available for filling stations and bulk-fuel depots.

The entry of Unison in the general small-business area will depend upon how quickly software houses are able to write or convert general-business applications to the Unix environment. Unison, with a large C library, and the Berkley enhancements together with a word processor and database manager, will assist this transition for software houses.

The Unison computer is a floor-mounted cabinet with 10 or 21-slot proprietory bus motherboard, physically complying with the Eurocard standard. It has the usual selection of IMI Winchesters (10, 20, 40, 80Mb), 8in floppy disk drives and streamer tape drives, with a SMD interface to large capacity disks available soon.

The minimum configuration model (D-10) gives three 9600 baud RS232C serial and one Centronics parallel interface, a 10M-byte Winchester, a 1.2M-byte 8in floppy, 2 x 128K RAM boards and leaves four slots spare for enhancements. Together with a Unison 900 series video terminal (based on a customised Mitac unit, similar to a Televideo 950), and Unix run-time licence and the buyer's choice of C, Pascal or Fortran 77, this gives a powerful system for between $14,000 and $15,000 excluding applications software.

The highly regarded Toshiba P1350 dual-mode printer is recommended by L & L. Cobol, Silicon Software's DEC-like Basic and the Unify database management system area also available.

The 68000 runs at 8Mhz and provides a virtual memory addressing space of 16M-bytes for each process. The memory of 128K-bytes to 2M-bytes in 128K-byte increments should satisfy even large installations, but

A marriage of idealism with the realities of the market

IN the short history of the Australian microcomputer industry, the contribution of Unison is a lot more than that of just another MC68000 machine. It is a contribution of anticipation, purpose and a necessary slide from idealism into pragmatism.

The initial conception of Unison was simple enough, a strong multiuser implementation of the first announced processor with 32-bit internal data paths. If it had been possible to turn that initial design into a production system without the delaying factors demanded by the Australian economic system, even Lionel Singer might not have heard of Wicat.

The first conception of Unison was a machine able to compete in world markets. As time went by and national private and government backers found insurmountable obstacles, the emphasis drifted back to import replacement. It was already obvious many US companies would build comparable 68000-based systems and that some of them would reach Australia.

In the climate of the University of Melbourne computer science department, where Unison designer Bill Hollier was doing some contract work, Unix reigned supreme. The perceived need was for an economical work horse computer on which developers with specific application software and hardware projects could build.

Hollier's concept became one of an Australian industry developing in Unison rather than in competition, so it would produce a product with many options that could stand up in the world market on the basis of what you could do with it, if not for its underlying architecture. Although the people involved would never have thought of it in those terms, what they were really looking for was a repetition of the Apple II phenomenon at a very different level.

Unison was kept out of public view for more than a year after its conception.

in Unison

512K-byte boards are due to be available soon.

The specially designed motherboard and bus for use in high-electrical-noise environments reduces the flexibility of the computer, but the availability of a prototype PCB with bus buffering, interrupt logic and DMA space will allow OEM expansion. A multibus adapter is on the drawing board for later release. The switch mode power supply is similarly designed to eliminate electrical noise and is available in three power ratings.

The cabinet is ventilated by a silent fan and stands just less than desk height. This makes the floppy disk and cartridge tape rather awkward to access by office staff. The terminals are supplied by Unison 900 standard green screen VDU's. The system performs well and with five development users on the system when we tried it, gave acceptable responses to Unix commands like EDIT and SORT.

The Unison is obviously aimed at the small mini market place. Its performance should help it to achieve entry. The availability of applications packages and general-business software will determine how long it takes to get off the ground. The 16-bit CP/M-based micros will have an automatic advantage given by the vast number of CP/M applications and may prove to be serious competition when multi-user applications become available. If the Unison can capture its vertical markets before the CP/M machines, its future should be assured.

The concept

THE Unison computer was designed by a small Melbourne-based electronics development company, Information Mechanics Incorporated Pty Ltd, whose principal, Bill Hollier, worked with the Department of Computer Science at the University of Melbourne. L & L Australia has bought the exclusive manufacturing rights for Australia and New Zealand of the Unison computer.

Under the terms of the agreement with IMI a special licence may be issued to tertiary and government research institutions entitling them to build Unison computers for their own use with documentation supplied by IMI, or buy machines from L & L.

This allows these institutions to buy a powerful computing system at minimum price. All general purpose bus compatible boards designed by licensees become part of the Unison product family, thereby becoming available for use by other licensees and for manufacture by L & L.

This means those who participate in the Unison concept are prepared to make a specific public commitment to Australian high technology in a practical and beneficial way.

This approach to licensing Unison means the design capability for all the essential aspects of Unison resides locally and does not depend on overseas suppliers. Thus the Unison machines will evolve in response to local requirements, and the local design capability will provide the basis of an Australian infrastructure. — the concept "working in unison".

The Unison concept ensures many research institutions around Australia are feeding their hardware and software developments into the family, to the mutual benefit of all. The parallel is drawn with the educational licence available for Unix from AT&T, which has immeasureably enhanced Unix.

Because of the breakdown of negotiations with the supposed corporate and government backers and later prototyping at Hollier's private company's own expense, the lid was kept on tightly. Hollier had seen the adverse effects of premature expectations and band wagon jumpers and was avoiding those risks at all costs.

But if you knew someone who had a friend in computer science and you were seriously interested in getting a multiuser Unix system as cheaply as possible, you might have got a whisper of an Australian system that would be available for a few thousand dollars within a few months. That was about the middle of last year, just after the US NCC which had suddenly brought Unix and serious use of micros to the forefront.

L and L had already been identified as a likely manufacturer of Unison when Hollier finally brought the existence of the machine into public view at a Unix users group meeting. That first exposure and viewing of the processor board was in part aimed at accelerating negotiations with L and L.

By then Hollier's Unison concept, as distinct from the machine, was to prove a major issue in the protracted negotiations. He was making sure the licensing agreement would facilitate that concept rather than seeking greater financial recompense for his company.

The involvement of L and L parent, Email, in the latter stages of the negotiations finally swung the balance, as its representatives recognised some worth in tiered pricing and sub-licensing to help Unison realise its true potential.

Email also took what might have appeared to be a charitable initiative in offering Hollier's group a full dealership, an offer that was in reality based on the pragmatism of enabling that group to process all the inquiries it had already attracted without waiting for a national marketing organisation to be put into place.

By the time the formal agreement was signed, L and L had accepted the Unison concept well enough to have made the product a key feature of the opening of its new premises, negotiated Victorian government financial support for its manufacturing program and started production runs of several of the boards required for pre-release and development machines.

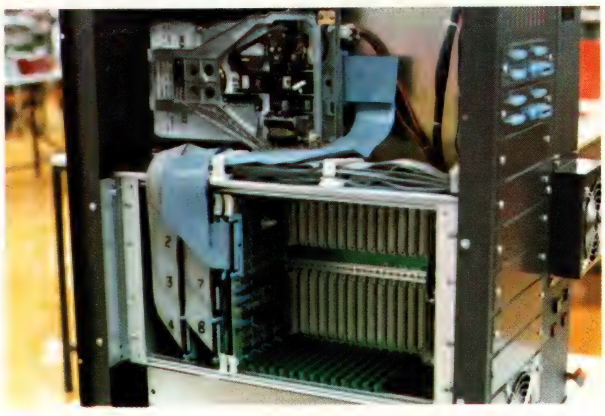
In January this year L and L was happy to recite the Unison concept as part of publicity distributed documentation on Unison manufacturing. But since then, the developing Unison computer has been portrayed increasingly as entirely a product of L and L.

L & L's "silicon valley" headquarters.

Part of the assembly line.

Stuffing chips into circuit boards.

A testing station for completed boards.



The Unison chassis.

Fitting boards into the Unison.

Unisons roll off the production line.

From design to product — Australian made.

Unison's designer

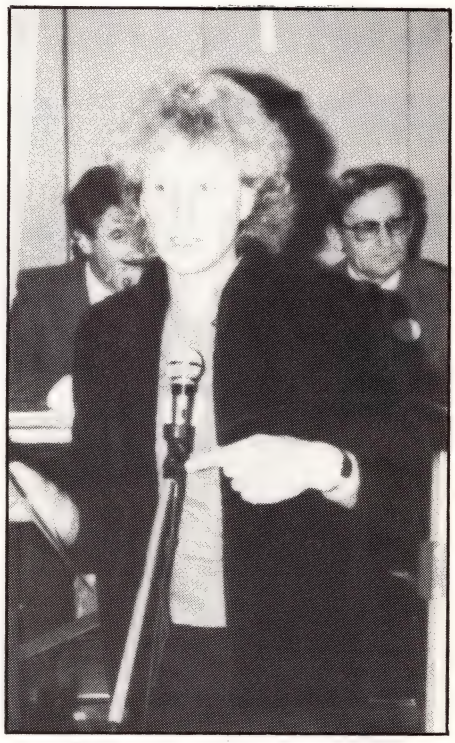
WHEN almost any computer designer is asked the reason for having developed his particular computer, his answer will be in terms of potential market — its perceived appeal to other people. Behind such claims there is typically some personal motivation for the designer to develop a particular application for himself.

Bill Hollier claims the key to best hardware design is in viewing the planned product from the perspective of the person who would be using it to develop software. In the case of Unison, it appears Hollier already had in the back of his mind a project to develop a truly Australian operating system on it, in spite of all the Unix de facto standard hype used in promoting the project.

While still waiting to receive the Unison due to him out of the first production batch, Hollier has committed himself to the development of such an original operating system. He has shifted his base out of suburbia to a modest retreat at the Otways, from where he is frequently commuting for contact with the industry.

Hollier's new operating system will involve a synthesis of concepts behind several proven modern systems such as Forth and Smalltalk into a complete machine-independent, networked product. The philosophy behind the operating system design is closely linked with his view of the emerging technological base on which the society of the future will be built.

The key element is the von Neumann concept of generative systems, machines or software which can produce identical copies of themselves for application in such exotic areas as space-based factories. □



Bill Hollier explains a point