

Résumé

# Karl Auer

BA  
GDAC

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Unless otherwise noted, events mentioned occurred in Australia and organisations are Australian organisations.

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## *Overview*

### *Personal*

Australian and Austrian citizenship  
Resides in Lochiel, Australia  
Born in Melbourne, Australia, 15th April 1961

### *Qualifications*

Bachelor of Arts(Germanic Linguistics) Australian National University, 1984  
Graduate Diploma of Applied Computing Central Queensland University, 1996

### *Contact*

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Lochiel NSW 2549  
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### *Memberships*

Member, Association of Computing Machinery  
Founding Member, Internet Society of Australia  
Member, Internet Society  
Member, Australian Unix Users Group  
Life Member, PC Users Group (ACT) Inc  
Vice President, Writers of the Far South Coast

### *Past memberships*

Vice President, Internet Society of Australia  
President, PC Users Group (ACT) Incorporated, 1991-1995  
Communications Spokesperson, PCUG, 1995-1996  
Member, Australian Capital Territory Online Services Advisory Group  
Convenor, PCUG C/C++ Special Interest Group, 1988-1996  
Awarded ACT Volunteer of the Year (Science and Education), 1995

## *Skill Summary*

### *Non-technical skills*

- excellent written and verbal communicator
- experienced in writing, proofreading and editing user documentation
- experienced in writing, proofreading and editing technical documentation
- experienced in writing, proofreading and editing online documentation
- experienced trainer/presenter
- experienced in user support, especially remote support
- significant management/supervisory experience
- significant project management experience
- excellent awareness of privacy issues in a technical environment
- can speak, read and write fluent German

### *Technical skills*

- expert in Internet related technologies
- expert in computer networking, especially TCP/IP networking
- extensive experience with IBM-compatible microcomputers and software
- expert knowledge of the Unix operating system
- expert in C, Pascal, BASIC
- competent in Java and several other computer languages
- have worked with and developed for multi-user and multi-tasking environments

### *Special Interests*

- privacy and freedoms in cyberspace
- networking, networks and the Internet
- object oriented design and development
- source code maintainability, portability and style
- multi-user/multi-tasking operating systems
- teaching
- poetry, writing
- recumbent tricycles

## *Courses presented*

Author/Presenter, CNS, Programming under QNX, 1990  
Lecturer (part time), Bruce TAFE, C Programming, 1991 – 1992  
Tutor (part time), University of Canberra, C Programming, 1991  
Presenter, MTE, C Programming, 1991, 1992  
Author/Presenter, PCUG, C Programming, 1989 – 1994  
Author/Presenter, PCUG, Using MSDOS, 1992  
Author/Presenter, PCUG, Using Word for Windows, 1994  
Author/Presenter, Centre for Continuing Education,  
Buying a Computer, 1995 – 1997  
Approximately 70 in-house courses on various topics

## *Courses attended*

IPv6 Symposium, (ISOC-AU, Canberra), 2005  
AUUG'05, (AUUG, Sydney), 2005  
Privacy and Security Symposium (Zurich), 2005  
Ongoing training in First Aid, (ETHZ, Zürich) 1999-2004  
Advanced DNS (Nominum, Zürich), 2003  
Project management in IT, (ETHZ, Zürich) 2002  
Patterns and Frameworks with Java, (ETHZ, Zürich) 2002  
Object-oriented programming with Java, (ETHZ, Zürich) 2002  
INET'01, (The Internet Society, Stockholm) 2001  
C5SC Cisco Catalyst 5000 Series Configuration, (Cisco, Zürich) 1998  
INET'98, (The Internet Society, Geneva) 1998  
AUUG'97, (AUUG, Sydney), 1997  
CAUUG Summer Conference, (AUUG, Canberra), 1997  
ATM Theory and Practice, (Gary Anido, Networkworld+Interop, Sydney), 1996  
Networkers '96 (Cisco), 1995  
Introduction to Cisco Router Configuration (Cisco), 1995  
Firewalls Tutorial by Brent Chapman, (AUUG), 1995  
Network Security (AUUG Summer Conference), 1994  
Perl for System Administrators (AUUG Summer Conference), 1994  
Microsoft TechEd'94, 1994  
Windows 3.1 Programming, 1993  
Object Oriented Design, 1992  
Novell Netware 2.2 System Manager, 1991  
Novell Netware Advanced System Manager 2.2, 1991  
Management Skills for Technical Personnel, 1991  
Numerous in-house courses

## *General notes*

I have always followed numerous interests outside my normal paid employment.

I run my own network at home. At present it is a Linux file and print server supporting Linux and Windows laptops with a small NAS offering backup file space. The size and complexity of the network waxes and wanes with my needs and interests. It has always had a Linux box providing Web, FTP, file and print services and a gateway machine (originally Linux, now consumer electronics) acting as a firewall and controlling a permanent link to the Internet. The central server and Internet connection provide me with a continued 'network presence'.

In late 1996 I assisted with the foundation of the Australian Chapter of the Internet Society and was Vice President of that organisation until late 1997.

I have been a member of the PC Users Group (ACT) since 1986, was a Committee member for most of that time and was President from 1991 to 1995.

In 1995 and 1996 I was Communications Spokesperson for the PCUG. In that role I was invited to be a witness in April 1995 before the Senate Select Committee on Community Standards Relevant to the Supply of Services Utilising Electronic Technologies, specifically their investigation of the regulation of online services such as bulletin boards.

In early 1997 I was invited to be a member of the Australian Capital Territory Government's Online Services Advisory Group, advising the Government on issues relating to information delivery by local government.

I was a panellist at the Joint Australian/OECD Conference on Security, Privacy and Intellectual Property Protection in the Global Information Infrastructure, held in Canberra in February 1996.

I collaborated with Andrew Tridgell on the creation of Samba, a Unix-based SMB-protocol server. I wrote the configuration module and the original printers module and wrote all the original documentation in man page form. Samba is now an integral component of most Linux distributions.

In 1994 I wrote a document describing how to set up printing under Linux; this document was later incorporated into the official Linux Printing-HOWTO.

I have written several papers and reports in a personal capacity and on behalf of the PCUG on issues relating to the regulation of the Australian and global online community. I continue to be very interested in matters concerning online privacy and freedoms.

I am interested in writing and have contributed many articles to various journals, including the PC Users Group's *Sixteen Bits*, *Australian PC User*, the newsletter of the Australian QNX Users' Group and the newsletter of the ACT NEC Users' Group. I edited the latter two and was technical editor of *Sixteen Bits* for three years. Though unpublished, I enjoy writing poetry.

I am also interested in teaching and training. I have designed and presented courses on C to the PC Users Group, and designed and presented a course on QNX/C for a company in Sydney. For about a year I also ran a public access bulletin board for QNX users.

I tutored in C programming at the University of Canberra and lectured part-time at the ACT TAFE (now the Canberra Institute of Technology). I spoke at the Australian Unix Users Group (AUUG) Canberra Chapter summer conference, and at AUUG97.

While at the Australian National University I designed and implemented a series of cross-skilling courses for the ANU Computer Services Centre (now Information Technology Services). At the ETHZ I trained my colleagues in dialup networking, DNS and DHCP matters.

In late 1994 I created The Internet Project, a dial up Internet access point for the PC Users Group and the Australian Unix Users Group Canberra Chapter. The project came online in February 1995, and for the following two years I managed the operations of the project. Besides network design and various management tasks such as negotiating for supply of bandwidth with suppliers, I also played a significant technical role in the day-to-day administration of the Project. I designed and wrote the initial versions of most of the project's World Wide Web pages, designed and developed the initial time accounting system and performed most of the router configuration and related network administration.

Starting out with some 600 users, the project was supporting over 2000 users by 1997. The project consisted at that time of three Sparcservers, with dial in access being provided via a Cisco AS5200 integrated digital/asynch system and connectivity to the Internet via DDS Fastway (256Kbps) and a Cisco 2503I router.

I enjoy flying a stunt kite on the beaches near my home, and I ride a Greenspeed GTO recumbent tricycle.

## *Employment history*

### *Nullarbor Consulting*

Director

DNS and DHCP consultant, 2005 – present

After my return to Australia in October 2005, ETHZ (the Swiss Federal Institute of Technology in Zürich, Switzerland) contracted me back to provide continuing consultancy in the areas of DHCP and DNS. In particular, to provide support for my successor and to continue the “dynamification” of the DNS and DHCP services, the goal being to configure DNS and DHCP servers directly and dynamically from data stored in a database of DNS and DHCP information. I telecommute to Switzerland from my home in Australia.

Supporting and advising my successor at ETHZ is done by phone and email. I collaborated with him on designing the next generation DNS structure for the ETHZ, which involves moving to Nominum ANS from BIND9, setting up internal and external views of our DNS, making the external views authoritative only, moving internal users to caching-only recursive servers and making all updates fully dynamic.

The “dynamification” of the DNS and DHCP involves writing Java programs (and some scripting “glue”) to use the data in the ETHZ Data Communications IP address database to update DHCP and DNS servers with changing information “on the fly”. The 100% dynamic systems went live in late 2006.

Work for other clients has included general Internet-related consultancy, database conversions and technical documentation.

*Eidgenössische Technische Hochschule, Zürich*

(Swiss Federal Institute of Technology, Zürich)

Network manager, 1997 – 2005

Founded in 1854, ETHZ is one of Switzerland's largest and most prestigious higher educational institutions, focussing on scientific and technical teaching and research.

ETHZ is not a 'campus' in the ordinary sense. Rather than being neatly contained within a single area, ETHZ is spread over many buildings (about 150) scattered throughout Zurich. WAN links connect further-flung groups, and connections are maintained to places such as École polytechnique fédérale de Lausanne (EPFL), ETHZ's 'sister' organisation in Lausanne. ETHZ also houses the core equipment for SWITCH, the Swiss academic and research network and the foundation of the Internet in Switzerland.

In all, the ETHZ network encompasses many thousands of computers attached to hundreds of subnets, connected using various different technologies. Although by the time I left most of the network was 100Mbit fast Ethernet on a gigabit core, the network was still far from being homogeneous. In my time there I saw Appletalk shrink from a fully-routed protocol through a tunnelled protocol to a local-use-only protocol, saw DECNet eradicated, FDDI phased out, ATM installed (and removed), and the links to the Internet go from two FDDI links to multiple gigabit links.

Like the physical network, the logical network was also varied - TCP/IP being the dominant and preferred protocol. The predominantly Wellfleet-based 'classic' TCP/IP network was phased out, to be replaced by a gigabit backbone supporting tag switching (VLANs) on Cisco routers and switches. This architecture was upgdade in 2003-2005 to support widescale MPLS, in order to support 'virtual zones', overarching routing entities spanning groups of VLANs. Parallel to this project was a move towards inter-zone firewalling and the use of 802.1x (port-level security).

My work at the ETHZ was always as part of the Communications Section, the team that designs, plans, installs and maintains the ETHZ data network. My career there can be grouped into three rough phases - the first phase was general network support, with emphasis on dial up systems and network planning.

The second phase was software development; I was designer and project leader for various software projects including a web-based DNS management system, integrating DHCP servers with our database to allow accurate management of address allocation and tracking of address usage, and a web-based support system to manage the introduction of and continued maintenance of MPLS-based virtual zoning. During this time I also set up the first ETHZ centralised DHCP system, based on the ISC DHCP server. Quite apart from the technical side, getting the ETHZ to embrace DHCP meant a lot of evangelising and training.

The third phase was evaluating, selecting, installing and project-managing the roll-out of the Nominum DCS DHCP server, to replace the original ISC-DHCP server. This has involved much analysis, design, documentation and programming (Java, Perl, script). During this phase I produced various Java management tools, including a tool to view server content, a tool to monitor server event streams, and a tool to monitor DHCP failover relationships. Because the DHCP service must be up all the time, I wrote programs that react to changes in the IP database and update the DHCP servers on the fly with new networks, new addresses, removed addresses, reserved addresses and so on.

Just before I left ETHZ to return to Australia, I evaluated, tested and purchased ANS, the Nominum authoritative nameserver. This will be the lynchpin of the future ETHZ DNS, providing as it does very high performance and completely on-the-fly configurability, including the dynamic creation and modification of zones. When I left ETHZ, I had already begun the design work on integrating ANS the ETHZ data communications databases.

For most of my time at the ETHZ I was the ETHZ Hostmaster. This involved performing or supervising the usual DNS-related administrative tasks, acquiring new address spaces as needed, registering and supporting new domains as needed, and technical control of the nameservers themselves. I wrote the programs that generate zone data from our IP database; as the ETHZ moves towards a fully dynamic DNS, I began rewriting these to update zone data dynamically instead.

Other tasks included setting up and maintaining a 150-line dial up service, configuring and installing routers and switches, and designing and project-managing various applications for ETHZ use.

## *Biplane Software*

Director, 1986 – present

Biplane Software was formed in late 1986 as a partnership. In early 1995, the partnership dissolved. I ran Biplane Software alone for several years, but any professional consultancy is now done through Nullarbor Consulting.

Biplane Software acted as a vehicle for various ventures. These were typically network or Internet consultancy projects, training, technical writing, Web design, Web programming, production of training materials and software projects for clients requiring custom programming or assistance.

Some projects included:

Setting up several Internet Service Providers and providing ongoing remote support and consultancy (Unix, TCP/IP, Cisco IOS, Perl, C, HTML)

Authoring and presenting a course on C programming on the QNX operating system.

A mouse driver for QNX, to emulate the Microsoft mouse API (QNX,C)

A friendly user interface for an optical mark reader (MSDOS, C)

A pop-up help system with customisable help files (MSDOS, C)

A B-tree library (C).

## *Australian National University, Canberra*

Network programmer, 1995 – 1997

The Australian National University has thousands of desktop computers, hundreds of Unix workstations and several supercomputers, all networked across a medium-sized Campus. Connectivity is provided to all University desktop computers via TCP/IP, with electronic mail in particular being pervasive. Various technologies, now chiefly the Web and ftp, are used to disseminate information across the Campus. The network is integral to the operation of the University and provides Internet access for all students, academics and general staff.

Network Services (now Networks and Communications) was responsible for the operation of the Campus-wide network, especially the Campus backbone. When I left, the backbone consisted of about eight Cisco 7000 routers running the EIGRP routing protocol. Network Services also maintained about 60 dial in lines for use by staff and students. These were handled by several Annex terminal servers.

The entire ANU network is connected to the ACT Regional Network Organisation, which is in turn part of the Australian Academic and Research Network (AARNet2). ANU Network Services is responsible for facilities management of the ACT Regional Network Organisation.

AARNet2 is a virtual private network supplied by Optus Multinet. AARNet2 connects the various Regional Network Organisations across Australia, tying together most major (and many minor) tertiary and other educational institutions.

In my time, AARNet2 ran over ATM for the most part (two smaller sites connected in via Frame Relay). The various Regional Network Organisations (RNOs) ran the BGP4 routing protocol within AARNet2 and with Optus Multinet.

My tasks in Network Services included troubleshooting network problems, configuring network routers and similar devices, maintaining the Domain Name Service, collecting and processing network traffic statistics and costing connectivity options for the remoter corners of the University. I was also involved in the changeover in mid 1997 from Telstra Internet to AARNet2, in particular handling the cutover for the ACT RNO and for the Northern Territory RNO.

The job entailed some programming, including automated configuration scripts and network traffic analysis. Network Services also makes information about its activities available on the World Wide Web, so the job included the production of HTML and associated CGI programming, chiefly in Perl.

This position required great attention to detail and an expert knowledge of Cisco router products and configuration. The task also required a good ability to liaise with my counterparts in other organisations, a wide-ranging awareness of many interoperating components, and an understanding of how they affected each other in the Campus environment.

*Australian National University, Canberra*

User support, 1993 – 1995

One of the challenges facing the University when I took this position was that the explosion in recent years of microcomputer usage had not been matched by suitable support and education mechanisms.

The Microcomputer Support Group at the Australian National University was created to help address the problem, and to provide assistance with policy development and last-line technical support for the increasing thousands of desktop computers in use on Campus.

Because the Group consisted of only three people, we all had a wide range of tasks. My primary roles were direct technical support, software evaluation, software licence management, software distribution and assisting with policy development.

This task required a very wide range of knowledge about computers and computing, a firm grasp of networking and Unix, a great deal of tact and the ability to liaise with all levels of management.

## *The Internet Society of Australia*

Vice president and founding member, 1996 – 1997

In late 1996, with a group of about fifteen others and with the support of several hundred Australian Internet users, I helped to found the Internet Society of Australia, a chapter of the Internet Society. In November 1996 I was privileged to be elected to the inaugural Board of Directors and to be selected by them as Vice President at the first meeting of that Board.

In its short history, the Internet Society of Australia has already begun making its mark, being heavily involved particularly in the developing governance of the Australian Domain Name System and the changes that are happening in Australian telecommunications.

## *PC Users Group (ACT) Incorporated, Canberra*

President, 1991 – 1995 (committee member 1989 – 1991)

Although this was a volunteer position, it consumed very nearly the same amount of time as a full-time position would have required.

The Group had over 3000 members and was one of the largest such groups in Australia. It was well known and respected locally and outside the ACT. The Group sold collections of public domain and shareware software, discounted various products to its members, ran a bulletin board and an Internet access point and published a 40-page monthly magazine. With an annual turnover in the region of \$500,000, the Group was a sizeable non-profit organisation.

The task of President had many aspects - to manage a group of volunteer administrators, to provide vision and guidance and to ensure that the expectations of Members were met while maintaining sound business practice.

In the nature of things, the President also had personal responsibility for several projects. I was personally responsible for overseeing the procurement of premises for the Group, for the design and implementation of a volunteer staffing program, and for the implementation of an Internet access point. This last was a major project, involving liaison with another local user group (the Australian Unix Users Group) and the procurement, installation, setup and ongoing administration of the system.

For my work with the PC Users Group, I was honoured to be chosen as ACT Volunteer of the Year in the Science and Education category in 1995.

In 1996 I was made a Life Member of the PC Users Group.

*NEC Information Systems Australia*  
*Software Development Centre, Canberra*  
Senior software development engineer, 1992 – 1993

The Canberra SDC was developing an imaging product called ImageWare. ImageWare consists of numerous soft ‘servers’ for handling devices such as scanners, image printers, image displays, PostScript conversions, character recognition devices, optical storage devices and databases. It is highly networkable, using remote procedure calls to handle interserver communication. Written in C (with Informix embedded SQL extensions), ImageWare is designed to be used by other developers as the imaging subsystem for larger projects. From the developer’s point of view, ImageWare appears as a linkable library and a number of installable servers. The Royal Australian Air Force was using ImageWare to store their many thousands of medical records.

My role in the team of ten was varied. Tasks ranged from testing and benchmarking new image accelerators to development and maintenance of the core server code. I also worked on a prototype Windows-based test harness, designed to provide network access via TCP from MSDOS to Unix-hosted ImageWare. This last involved writing Windows DLLs and modifying Unix RPC code to compile under MSDOS, then interact with products such as XVision, PC/TCPIP and Chameleon.

Documentation and constant review are a feature of the NEC software development environment. I played a significant part in those areas also - writing documentation and participating in the quality assurance process.

This position required flexibility and a broad range of abilities, including the ability to work on several projects at once, managing one’s own approach to the various tasks.

*Australian Optical Fibre Research, Canberra*

Software analyst and designer, 1992

This was a very short but very interesting contract, working on the software for a newly built optical fibre coupler manufacturing machine. The client was under great pressure to get the software effort off the ground quickly and cleanly.

My task was to liaise closely with the Project Leader to identify, design and begin implementation of those portions of the software (in C) that could be begun while additional operating system and software engineering resources were obtained.

Although later developments caused most of the implementation work to be discarded, the design work proved to be an invaluable basis for the further development of the project.

This task required a fast and effective approach to isolating areas of logical independence in a complex system, plus the ability to work under pressure and coordinate the efforts of three junior programmers. A knowledge of real-time constraints was also necessary.

## *Paxus EDI, Canberra*

Product support manager, analyst/programmer, 1990 – 1992

Paxus EDI (Electronic Document Interchange) controlled a network of synchronous and asynchronous dial up and direct links to a mainframe in Sydney. It provided communication services to numerous corporate clients, including the Australian Customs Service for its EXIT scheme. In software terms, it produced data entry and communications software which allowed clients to create and communicate appropriate information to each other using the EDI standard message format EDIFACT. My association with Paxus EDI was with the software venture rather than with network support.

In this position I supervised one full-time and one part-time analyst/programmer. The team was responsible for maintenance and enhancement of a core product written in C. We were also responsible for the maintenance and enhancement of the custom libraries used by other programming teams in the company.

As part of this task, I produced specification documents, user and technical documentation, and standards documents. Because the team was so small, I also did a lot of design and development in C.

When most of the company relocated to Sydney, our team was left with most of the responsibility for technical support. Typically this was telephone support and covered all levels of problem resolution, from user error through to hardware faults.

This position required management expertise, good communication skills and a high degree of technical ability.

Before being promoted to product support manager, my duties were chiefly to design, develop, document and support programs, utilities and custom libraries for our core product, the Paxus Workstation. This product was a menu shell that drove a complex integrated set of batch files, scripts and custom utilities to move files to and from the Paxus host. Clients used this software to send data to each other.

One of my main responsibilities was the creation, documentation and maintenance of a set of custom libraries for the rest of the programming teams to use. These consisted of modules to handle common though complex tasks in our environment - accessing dBASE-format data files, for example.

The position required a high degree of skill with the C programming language, the ability to design innovative software solutions and the ability to write accessible, usable and bulletproof code.

## *Chemdata, Canberra*

Analyst/programmer, systems programmer, 1988 – 1990

Chemdata produced pharmacy and retail software. The pharmacy industry in Australia is very complex and highly regulated. Chemdata software made pricing, reordering and dispensing of drugs very much easier for the pharmacist in that complex environment. As a result, Chemdata branched out into more general areas such as point-of-sale software, while still being very much pharmacy specialists.

Chemdata's software products were based on the UCSD p-System, a Pascal development environment that is typically hosted by other operating systems. As a systems programmer, my task was to interface the p-System reliably to whatever native operating system was required - MSDOS, PCDOS, PC-MOS, and Concurrent DOS. In particular, keyboard and communications drivers often needed writing or adapting.

Significant jobs also included writing intertask communications drivers (semaphores, message passing and so on) for multitasking operating systems such as PC-MOS, and evaluating software for use with our products.

Much of the work was very low-level, requiring an intimate knowledge of the host operating systems as well as the p-System, and great attention to detail. Because it was in some senses a support role for the applications programmers, the work was done largely independently.

As an analyst/programmer I wrote several file and data transfer systems. Pharmaceutical suppliers were discovering that electronic ordering facilities were useful. Each would implement some method of ordering by telephone. No two suppliers ever chose the same communications protocol, so each required a custom-built program to properly transfer order details from the Chemdata stock control system to the supplier. The supplier protocols were rarely documented properly or accurately, so the whole process was by no means straightforward.

Other tasks included technical support and training other staff in the rudiments of asynchronous communications. Technical support was done both directly with clients in some cases, but also indirectly, by acting as technical backup for the usual support staff.

This job required excellent technical ability, a lot of people skills in a support role, and a good deal of perseverance.

*Department of Industry, Technology and Commerce, Canberra*

User support, 1987

At the time I joined the Department, they had a (for the time) large LAN of about 250 IBM XT and AT clones. The network was G-Net, running Novell network software. The system was in use constantly, with a wide variety of software.

In this position I was partly responsible for staffing the Hotline, a support desk set up to assist people with problems they may have using the network or software. When not actually answering the telephone, the job included going to the various users' workplaces and assisting them in the resolution of their problem. In many cases the problem was user error, in many cases the problem was a software fault or installation error, and in many cases the fault lay with the network. Regardless of the source of the problem, we were expected to fix it fast.

This job needed a good knowledge of the network, a good knowledge of the more common software in use, the skill to properly locate, isolate and resolve problems, and a very large amount of tact and diplomacy.

I also evaluated commercial packages for use on our network, and utility and control software as necessary. For example, it was my responsibility to design and implement a network backup strategy and evaluate and obtain suitable third-party software for the purpose.

Part of this task was also to document the LAN and its resources.

*Parity People, Canberra*

Account manager, 1986 – 1987

A subsidiary of Parity Australia, Parity People was a contract house, supplying contract IT personnel to Government agencies.

As account manager, it was my task to locate suitable positions and then to locate suitable people to fill those positions. This involved liaison with personnel managers in many departments and liaison with contractors in the field.

The job required a lot of diplomacy, good negotiation and bargaining skills and the ability to meet very tough deadlines. It also required the ability to accurately match the skills of a prospective applicant to the positions that were available.

## *Palm Computing, Canberra*

Analyst programmer, 1984 – 1986

Palm Computing created accounting, stock control and point-of sale software for the grocery retail trade. Early in its history it did general custom programming for numerous clients, but has since become more specialised.

I worked on a wide variety of jobs, including accounting, stock control and systems applications. Applications written included a complete debtors system for a church office, a stock control and debtors system for a local steel merchant, and a stock control and manufacturing system for a seed merchant. These were written in dBASE II/III and a highly structured multi-user BASIC.

Much of Palm Computing's 'bread and butter' came from a contract with one of Canberra's largest grocery and liquor warehouses; I did a lot of maintenance programming on an NCR minicomputer in COBOL. The applications being maintained were mainly stock control and ordering systems.

Because the company worked on so many and such varied projects, constantly juggling customer requirements and available resources, working for Palm required technical skill and great flexibility.

After some time away from Palm, I was rehired as a contractor for several months to assist with the development of a creditors system in the above mentioned warehouse.

## *Bruce Hall, ANU, Canberra*

Workscheme coordinator, 1983

Bruce Hall is one of the student residences on ANU Campus. It provides full bed and board. The Hall arranged with the student body that students could perform two hours work per week working for the Hall (tasks such as dishwashing, cleaning and gardening) in return for a rebate on their accommodation costs.

As workscheme coordinator it was my job to allocate and supervise the carrying out of the required tasks. With about 220 students, all with different lecture timetables and social commitments, organising an equitable and effective distribution of the work was no easy task. In many cases students were unwilling to do the work they had agreed to do, or were unwilling to accept the particular tasks set them.

The job thus needed good organisational ability, good negotiating ability and a lot of flexibility.