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BITS & BYTES

December/January 1987/88 $2.75 (incl. GST) Aust $2.75

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  HyperCard – encyclopaedic potential for the Mac?
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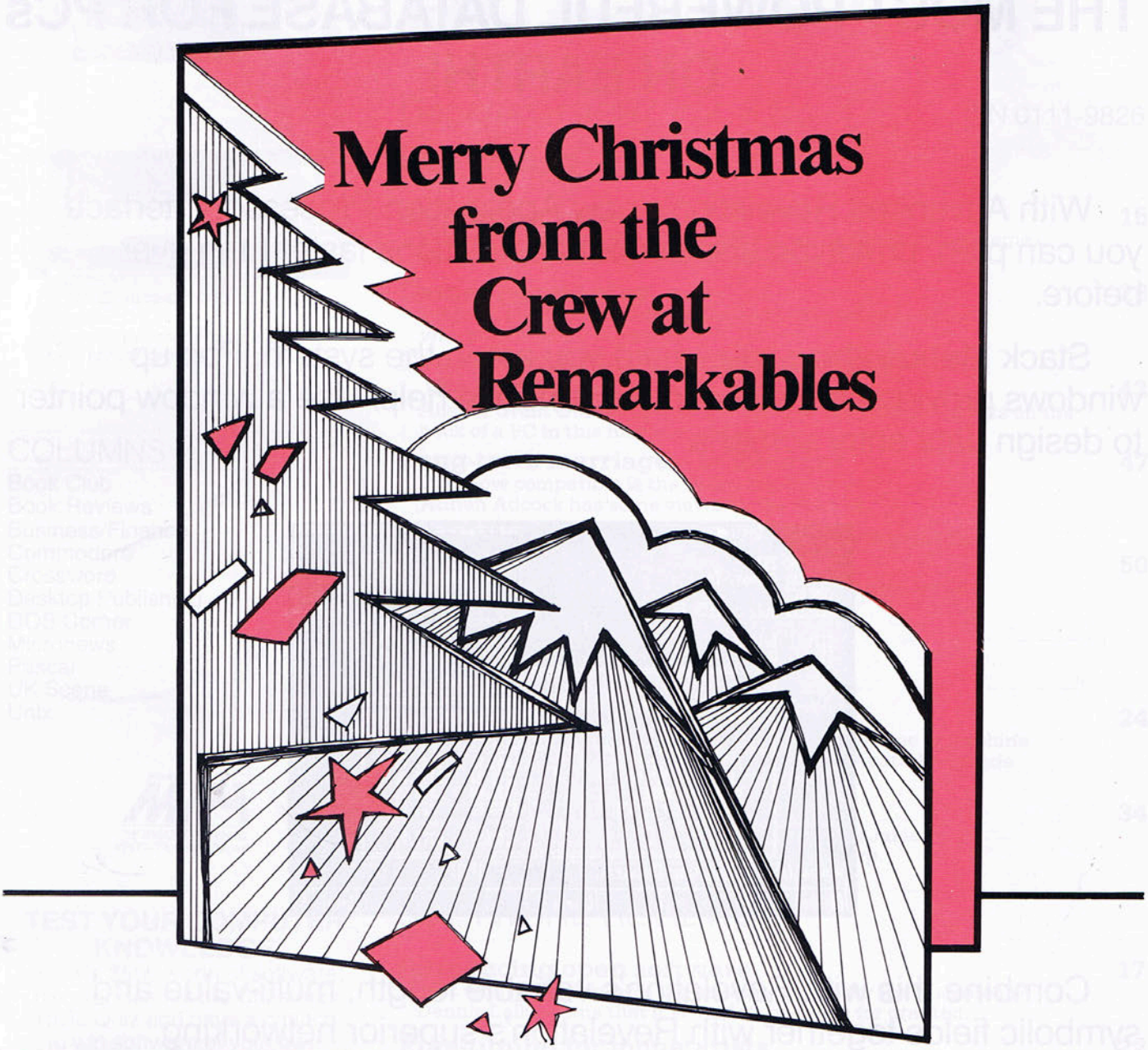
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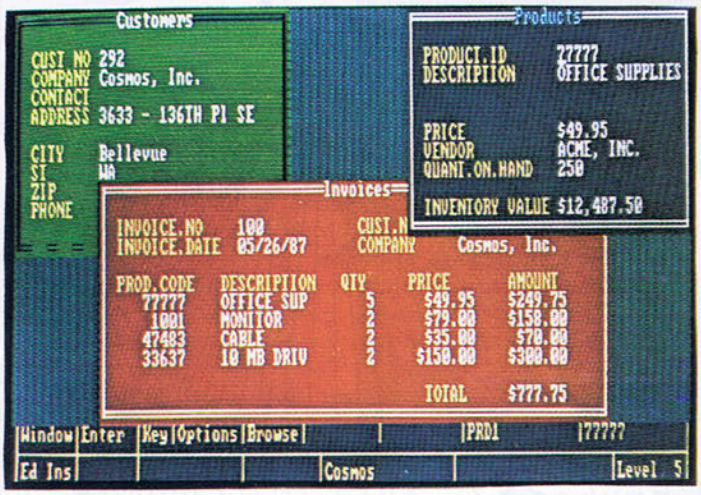
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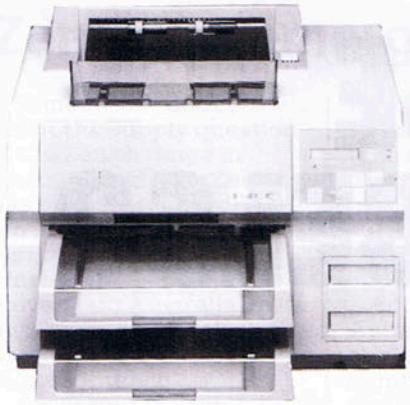
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See also our Christmas Special on page 27.

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Introducing MicroBYTES – the extra bimonthly bit for micro users.

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Zenith re-emergence?

Some recent doubt about the supply question of the Zenith range in Australia and New Zealand has been clarified with the recent signing of an agreement between the manufacturer, which has moved into Australia on its own account, and the previous distributor for the region, Anitech.

According to John Delamere, the new general manager of Auckland-based IGL-Anitech, Zenith itself will be the Australian distributor and Anitech the principal dealer, while in New Zealand IGL-Anitech is still the only dealer. "Of course," he says, "that may change."

He is a firm believer in laptop portables, which he considers are "going to take a quantum leap". In the US the Zenith is the biggest-selling laptop, and supplies for New Zealand are expected to resume shortly.

Other divisions of IGL-Anitech will be emphasised in coming months. "The component and instrument side will grow dramatically," states Delamere, who also believes the communications part of Zenith, with its broad-band Z-Lan single-cable system, is something to watch. "My predecessor was unaware of the magnitude of its potential."

Remote examination a success

Postgraduate students in Victoria University's Diploma in Telecommunications course sat their exams at home, using ICL Computerphone equipment supplied by Telecom. They took their papers through the Starnet link at 6:50 pm one day and handed their results in at 8:30 pm by the same method.

Two of the 19 candidates were not in Wellington at the time. One was in New Plymouth and the other in Ireland, from where he was able to communicate via Australia's Starnet and his local Eirpac Service.

According to Frank McCarthy, senior lecturer in communications, it was the first time an exam had been sat in such a way at Victoria, and although it was an experiment, the exam marks were part of the course work for the diploma.

Those involved were said to be excited by the success of the experiment and said it could lead to the development of an "enormous" export industry for New Zealand in the marketing of educational courses internationally.

Reorganised shows in Australia

A five-year agreement between the Australian Computer Society and ACP Exhibitions Group has been signed and the former Australian PC Show series renamed The Australian Computing Exhibition, in an effort to keep up with the changes and current trends of industry thinking and make the show the premier Australian event.

"Change is essential," says John Goddard, president-elect of the ACS, "and we feel that although the concept of an annual conference is sound, we need to adopt a much higher profile in the exhibition area and ensure that both conference and exhibition are responsive to needs of a wider group of people covering all aspects of the industry."

ACP has in recent years developed a presence in the computer industry through its subsidiary Computer Publications, publishers of *Computing Australia, Australian Personal Computer* and shortly *PC Week*.

Biggest-selling supplies

What's top of the list in sales for supplies from computer stores? From the US comes word that toner cartridges for laser printers are dominating the dollar value of such supplies, a good indication of the penetration of laser technology into the printer market – or perhaps the high cost of running the laser printer.

Happy birthday, Turbo Pascal

Borland celebrated the fourth anniversary of its Turbo Pascal programming language with version 4.0, which compiles at 27,000 lines per minute on an 8MHz AT and now breaks the 64kb program size barrier, supporting programs up to the memory limit of DOS. It was introduced recently to members of the Capital PC Users' Group in Bethseda, Maryland, followed shortly afterwards by the companion developers' library with the full complement of Turbo Pascal Toolboxes.

Oh dear!

Digital Equipment Corporation (Australia) denies playing any major part in the downward plung eof the stockmarket, despite the fact that its SEATS (Stock Exchange Automated Trading System) went live on the newly-established Australian Stock Exchange on 19 October, the very day the world stockmarket took fright.

Indeed, DEC says the MicroVAX-based system, one of the world's most sophisticated automated trading systems and modelled on those used in Toronto, Tokyo, Seoul, Cincinatti and Paris, "came through with flying colours." Based on priority trading – the first broker to bid for a stock at the best price will be served first – SEATS will see the end of the old call-out system, and initially comprises 200 terminals located on the stock exchange floor as well as in traders' offices.

The ASX was established on 1 April as an amalgam of Australia's six capital city exchanges. The network link is based on Digital's Ethernet with bridges linking Melbourne and Sydney into a single LAN, and will extend later to the other exchanges in Perth, Hobart, Adelaide and Brisbane.

Now the only thing is to do something about what actually goes on in there.

Software changeover

Auckland-based Mycroft Systems has taken over Paxus Consulting's software agencies for both New Zealand and Australia. Packages involved include those developed by H&M Systems Software and Thorn EMI, in addition to the existing mainframe efficiency packages. Mycroft will be supporting the customer base established by Paxus, as well as extending its market.

NEXT MONTH

- **Buyers Guide** – PCs for small to medium business applications
- **Connections** – PCs talking without too much noise.
- **Back to School** – What's offering in computer education. More of the same?

Vic Francis questions the PM – Minister of Education.

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Joining the Macrush

Lotus is doing its bit in the two-way interchange between the MS-DOS and the Macintosh worlds (Ashton-Tate has just released dBase Mac, barely 12 months after its pre-release launch), with Mac versions of well-known software. Modern Jazz, the six-function integrated package, will be delivered during the first quarter of 1988, while details about the Macintosh Lotus 1-2-3 should be known in the second half of next year.

But going in the other direction is Microsoft, whose PC edition of Excel has been released in New Zealand. "It's a step forward in software technology which matches the step forward in hardware technology," said Linda Graham, managing director of Microsoft Australia, at the product launch.

She said her company's mission for the 12 years of its operation had been to put a PC on every desk, but it still wasn't easy enough. "Our whole methodology is to make it as easy as possible."

To that end, Windows for the 80286 and 80386 machines was announced at the same time, with Windows 3 running only on the 386. Microsoft's policy, said Graham, was to release all products under Windows and then migrate them to OS/2, which she pointed out was expected to be shipping ("early") in January or February 1988. "Probably 150 companies will be ready to introduce Windows products in the next 12 months."

System comparison system

A three-volume set of loose-leaf manuals, updated monthly, is the basis of Competitive Profiles, set up by Ideas International Pty Ltd of Sydney to give potential buyers and sellers of computers an easy comparison of price, performance, processing power and other pertinent data.

Analysis is provided in the $A30,00 to $5 million range, covering the super-micros, minis and the bottom end of the mainframe market, while large mainframes are planned to be included by the end of this year. Several New Zealand subscribers have signed up, including the Government Computer Centre, and a NZ edition is expected to be available shortly. The full service is available on a subscription basis for $A3,335 a year.

Information for all to see

Tired of dull old labels on your products? Want a change from stockpiling preprinted labels? A system developed in Ohio and distributed here by All-Mark Industries of Auckland allows the design and printing of labels using standard PCs and a range of graphics printers from dot-matrix to laser.

Bar codes and pictures can also be incorporated into the design using the Easylabel+ package, which gives a graphic presentation – to scale – of the label on the screen.

More integrated PCs

Announced by Wang at the end of October, a couple of months later than previous predictions, was its new family of PCs which offer both full compatibility with the PC/AT MS-DOS world and workstation functionality and connectivity to the Wang VS mini.

Two basic models are offered: the 80286-based PC 240 and PC 280 with either four-or eight-slot chassis respectively; and the 80386 PC 380, again with eight slots. Such things as keyboards, monitors, options cards and most storage devices are common to the full range, while system networking and terminal emulation software is available from Wang and third parties.

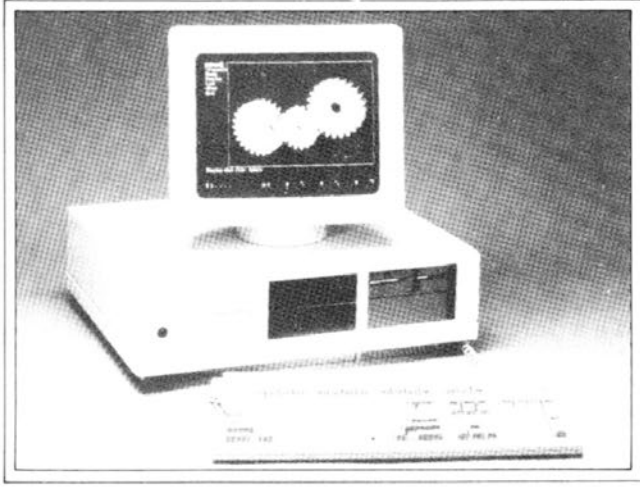
Build-it-yourself AT

Armed only with screwdriver and the appropriate book of instructions (no soldering iron or technical knowledge said to be necssary), computer buyers will be able to assemble their own ATs with kitsets now being sold by Dick Smith Electronics. The usual range of disk drive and graphics card options are available, with eight expansion slots and clock speed of 6, 8, 10 or 12MHz. The finished result, says Dick Smith, is fully guaranteed.

Portable desktop manager

Lotus Metro, the desktop-management software which combines 12 accessories and a macro generator in a pop-up mode, is to be bundled with the new Toshiba T5100, the company's first 16MHz 80386 portable. Expected to be available early in 1988, the T5100 has 2Mb RAM, 40Mb hard and 1.44Mb 3½-inch floppy disk drives, and built-in EGA with high-resolution gas-plasma screen.

Lotus has also announced a 3½-inch disk version of Manuscript, aimed at the new series of IBM PS/2 running MS-DOS 3.3.



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How to book without a book

The Ministry of Transport in Wellington has completed a successful pilot study in which the Psion Organiser II was used by traffic officers to record statistical data usually documented by manual means.

The current method, still in use by the majority of traffic officers in New Zealand, requires an officer to enter data on each incident encountered (accident, alcohol testing, vehicle check, etc) into a traditional paper diary/log-book. This information is later handed in and manually keyed into a central computer for further analysis.

Senior Sergeant Errol Brown, in charge of the pilot study, says, "Manual input is the Achilles heel for a system that needs reliable statistical information. It is time-consuming, a costly use of resources, and prone to errors."

For the pilot study, a special software program was developed for the Organiser II. It prompts the officer with program messages and option selections, while also offering a comprehensive set of error warnings and double checks.

The officer simply selects the desired option and completes the routines for storing and recording data. The program records the date and time of various entries during each officer's shift and, in general, keeps track of officer activities with a minimum of effort on the part of the user.



At a specified time, information is downloaded to a central computer either by remote transmission via modems or by direct downloading at the central computer site. This is accomplished via the Organiser II's Comms Link (RS232) interface. Information entered into the hand-held computer during an officer's shift is stored in plug-in Datapaks, which may be removed from the machine and handed in for downloading at any time.

Once information has been received by the central site computer, various reports can be printed, offering the MOT a hard copy of the officer's statistical data.

Leading the way with Motorola

General Automation, whose Zebra range of Pick-based multi-user systems is represented here by AWA Computers, is the first to use the new Motorola 20MHz MC68303 microprocessor for a business sytem. Its 8830 256-user system should be using the MC68030 in early 1988, and also contains the MC68010 intelligent terminal to help simplify data collection and word processing.

GA's group vice-president (marketing and sales), Rene Caron, reports that AWA Computers has placed 35 computer systems in New Zealand since the beginning of July this year.

Crackdown on UK piracy

After a police raid precipitated by the Federation Against Software Theft (FAST), a German national living in England has been arrested on charges of forgery in connection with software piracy. While the full scale of the operation is still not yet known, it seems that products were being shipped in from the Far East and then sold via mail order, with a "large amount" of software, hardware, manuals and disk-copying equipment being found. The suspect is also wanted in Germany for fraud.

The only Bull market?

In a period of stockmarket bears there's still the odd bit of Bullish news. Honeywell Bull is in the final stages of signing a major contract for an initial order of some $3.6 million with Telecom for an Eft-Pos pilot system.

Based on the AP6 (a PC/AT with DPS6 board) as customer facility, the system connects to a Honeywell DPS6 Plus model 200 mini via more DPS6 Plus model 410 network controllers. Each AP6 can run either the Honeywell GCOS operating system or MS-DOS, with the ability for each terminal to be configured individually.

Count your liquor quicker

Thexus group has released BarTrack, a PC package to run bar management and assessment for liquor industry outlets. Basis of the unit is a Telxon hand-held data recorder for stocktaking and the normal weekly data correction, which then downloads into the office PC via a modem or other RS232 device.

According to Thexus' Peter Biggs, "The liquor industry's crying out for something like this. It adheres closely to standard practice, so there's a minimum of training involved. It's a low-cost entry to computerise accounting for hotels and taverns."

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Rushed shipment

The first delivery of Amstrad computers, worth some $2 million, was airfreighted from the UK last month for the product's new distributors in New Zealand. Amstrad Computers, a division of Brandt Corporation, was supposed to take over on 1 November, but Grandstand Computers relinquished the distributorship early, leaving a hole in the market which had to be filled quickly.

"We seem to have noticed a trend away from clones towards the brand names," says Jim Mather, general manager of Amstrad Computers in Auckland. "The New Zealand market is different from that in the UK. Low-cost clones were established here before the UK, but there's still no equivalent of the major clone importers over there."

The shipment includes two new models introduced at the PCW Show 1987 in September. The PCW9512 word processor now comes with a daisywheel printer (with Centronics connection), spelling checker and mail-merge, paper-white monitor and keyboard conforming more to the computer industry standard, overcoming the major criticisms voiced by users of the well-established PCW8256 and 8512 models.

Replacing the PC1512 introduced a year or so ago is the PC1640, available in nine models depending on disk drives, mono or colour screen and graphics cards options. RAM is 640kb standard, and the machine is aimed at the small to medium business user, with the low-end model (prices start around $2,200) in the home environment.

The company move is expected to end some doubts in the marketplace. "It's fair to say we've had a few hiccups and uncertainty," admits Mather. "We've taken over the warranty liability, and we'll be selling computers direct to the education market but not otherwise direct to the public. We're setting things up under a professional understanding to the dealer network."

And without divulging details, he expects the portable Amstrad, available probably in February or March 1988, to be a market leader.

Extending peripherals

Strategic Information Systems New Zealand Pty Ltd, which recently opened an office in Auckland, is now the local distributor for the products of IDEAssociates, the Sydney developer of such PC peripherals as PC-to-mainframe communications, mass storage subsystems, memory and multifunction boards, colour graphics cards and modems.

The local Strategic company is a joint venture between Mike Slattery of Strategic in Melbourne and PA International Consulting Services.

Appointments



Sid Humphries is Integrated Computer Systems' new group general manager (export), a position created to support the company's strategies in new ventures both in New Zealand and overseas. The emphasis of his responsibilities will be on structuring the company to support its current export thrust.

Wordstar Australia's new man in Singapore to manage its Asian (except Japan) operation is **Ian Young,** previously national major accounts manager for Commodore, national sales manager of Computerland Australia, and sales and marketing manager for Momentum Computing, an IBM mainframe supplier. Several software companies have shown interest in the Singapore market since the government there brought in stringent new copyright laws.

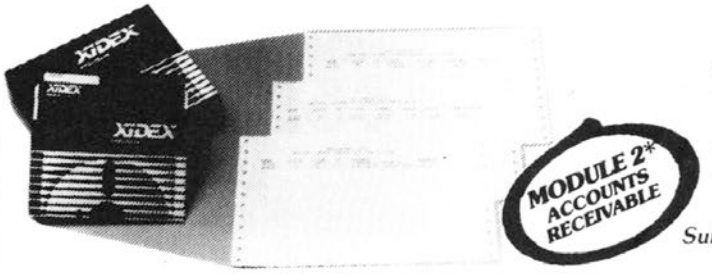
New Sysgen product manager at Guardian Data is **Tony Atkinson,** who has more than five years' experience in the Australian computer industry.

More downward trends in prices

Another software supplier has announced price decreases, but not necessarily because of the stronger NZ dollar. ComputerStore says the Digital Research line has come down an average of 25 per cent, following the sorting-out of a supply problem, and the New Zealand supply now piggy-backs on Micro Australia. Micropolis disk drives are down about 10 per cent, with the company now producing drives more cheaply in Singpaore.

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Time for a change

The Taiwanese clone brand of Multitech is no more. In its place is the name Acer, chosen because it's short, unlikely to be confused with anything else, and means sharp, penetrating, sagacious and ardent in Latin. (It also gives rise to the word acerbic, which means harsh, bitter or astringent.)

The 11-year-old Multitech Industrial Corporation, represented in this part of the world by Dick Smith, becomes Acer International. Its products have seen a substantial European penetration, ranking ninth in Germany and beating other Asian suppliers.

On the audit beam

The nationwide chartered accountant firm of Chambers Nicholls has received the auditing package CBEAM (computer based environmental assessment module), designed to run on an IBM-compatible PC to improve audit quality and give more meaningful information while holding audit costs.

The package is said to automate many repetitive tasks, reducing the chance of error and the amount of time taken in performing the audit. It also has the capability of taking data from a client's computer and linking the two systems together.

Interface for travel agents

Auckland-based software house Direction Computers has announced that it can now interface its travel agents' ticketing and accounting system with the computer reservations System One, a subsidiary of Texas Air with more than 20 major airlines worldwide participating as direct-access carriers.

"This concept provides for the total automation of the agent's requirements," says Direction Computers' managing director Phillip Jenkins. "The interface with System One fulfils all the agent's needs as defined by the Automation Committee of the Travel Agents Association of New Zealand."

PC-compatible laptop from Tandy

Tandy, a name long known in the laptop field, has introduced its 1400LT which runs the NEC V-20 microprocessor, compatible with the 8088 and operating a 4.77 or 7.16MHz of 768kb gives the full 640kb addressable by MS-DOS plus 128kb for RAMdisk or print spooler, while disk drives are two front-mounted 3.5-inch floppies.

In line with other laptops on the market, the screen is a backlit supertwist LCD of 30 by 25 characters, and power is supplied by a removable, rechargeable 12v battery pack (for four hours' use) or AC adapter. The 1400LT is bundled with MS-DOS 3.2 and retails at just under $4,000.

High-speed tape backup

Guardian Data has announced the Australian release of the Smart Image-60, a 60Mb cassette tape backup system for the XT and AT range of compatibles. It has dual read/write heads for single-pass data verification and sufficient capacity to accommodate expansion of future hard disk drive storage.

The proprietary automatic backup software allows it to be set to back up only those files which have been changed, once the entire disk has been backed up. It also includes a dedicated tape-drive controller for high-speed data transfers at a rate of up to 90kb/sec.

Upgraded business package

Integrated business packages are a well-established software product, and some are now being upgraded with additional features. Ability Plus by Migent offers, in comparison with the original package, more powerful macros, a British spelling checker, relational database, larger spreadsheet and a windowing function.

Because it is able to import and export data from dBASE, PFS, Wordstar, Multimate, Lotus 1-2-3, DIF and other formats, it allows PC users to take advantage of this existing database," says Migent sales director John James.

New links for DSIR

The tender for extensions to the DSIR's computer network in Palmerston North has gone to Digital Equipment Corporation in a joint venture with Austral Standard Cables. According to ASC's Auckland branch manager and network consultant, Noel Bernstein, it is the first major New Zealand project to utilise the ISOLAN range of Ethernet products of both standard and "thin" Ethernet and active fibre optics, with all three being used.

All cable will be manufactured by ASC, most of it in its Christchurch factory which has already produced many kilometres of fibre optic cable for Telecom's main trunk and inter-exchange network.

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Serious wargames

by John King

Wargames have been around for a long time and in many forms. The principle of moving model soldiers or ships around on a large table has been in use for centuries, while just about everybody must be familiar with the movie scenes of Battle of Britain operations rooms with their symbols of aircraft formations on large maps.

More recently the wargames term has also come to mean the arcade-type of shoot-'em-up computer simulation, often of the sort where the player operates a fighter or helicopter to take out enemy targets. Modern trends in ray tracing with RISC transputers can give these remarkable realism with three-dimensional effects, beyond even the airlines' flight simulators which are tied to expensive mainframes, and the tendency today is very much towards computerised simulation.

New Zealand's armed forces are well up with such technology, and it's no surprise to find the army working on such a project – but with just one reservation.

"I shudder at the name 'wargames'", says Lt.Col. Sam Hollander, SO1 Ops at Land Force HQ, Takapuna. "It's operational simulation – simulating something by computer to train people. Our task is to make it user-friendly with minimal need for computer or keyboard skills, so that the officers using it can concentrate on military skills. The New Zealand Army in peacetime has better things to do than have all those people pretending to be the enemy."

The perception of the "enemy" has changed recently. Gone are the days when the New Zealand armed forces were ready to leap into action in any part of the world, secure in the knowledge that any ordnance used would be quickly replenished by its allies, particularly the USA. Gone too is some of the need to keep up with the very latest in weaponry, often instigated by the weapon manufacturers rather than as a result of requests by the military.

Change of rules

Instead, the emphasis is on low-intensity operations in the south-west Pacific, or "aid to the civil power" as it's described in the most recent White Paper on defence. this new form of action needs a change of rules in any simulation, most of which assume an automatic return of fire, but in the low-intensity situation there is a strong human factor taking into account police, civilians and possible hostages. The army would not be popular if a terrorist's sniper fire from a local village street was met with a couple of artillery shells which eliminated the entire street along with its civilian population.

"There's no suggestion that computers are going to be used for decisions, but only for simulating the battlefield."

Against this background is the current development of CABS (computer aided battlefield simulation – the military is even stronger on acronyms than the computer industry), to run on seven IBM PC/ATs which can be networked during exercises.

The aim is to train the officers of a brigade or battalion headquarters in decision-making and procedures. The traditional method is to have HQ set up in a large tent and conveying instructions to the companies which move about the exercise battlefield, with a second group playing the "enemy" in response to its own HQ. Such exercises are expensive in terms of manpower and the effort needed to move them around, so the present idea is to simulate the movement of all those soldiers, using computers as an adjunct to a terrain board, a very large-scale map set up in a convenient location such as a camp gymnasium or cinema, and completely separate from HQ.

"There's no suggestion that computers are going to be used for decisions, but only for simulating the battlefield," states Major Brian Whitworth, SO2, CABS project and the only person working full-time in this area of training at the moment. He dispels any visions of tanks bounding across the Rangipo Desert, commanders staring at computer screens, by adding, "Computers are absolutely useless in the field. Rifles are strong enough to be almost soldier-proof, but computers are far too delicate."

Nor is the CABS screen output anything like the popular idea of visual battlefield effects. Instead, it's all





words, tables and symbols, just like any database or spreadsheet found in thousands of businesses around the country.

The army is developing its simulation in separate modules, more than a dozen of which will make up the final full picture. In existence so far are PALS (personnel and logistics systems), an accounting system for keeping track of the equpment, fuel, stores and men used up or lost as they move around the battlefield; OPSIM, an environment simulation prototype; and a movement module for element grouping, currently under development.

OPSIM is written in compiled dBase III, and its environment parameters include such things as temperature, precipitation, cloud cover and base height, wind strength and direction, lighting conditions, moon and tide. It includes a time file to change weather and other factors at predetermined points, the computer running in real-time during the exercise. The movement module, a Lotus 1-2-3 spreadsheet, takes into account the variables of terrain, soil type and condition, lighting and anything else which can be thought of which will affect the movement of vehicles and troops on foot.

"The battlefield is infinitely complex," Whitworth points out. "The computer can't handle all the complexities, and doesn't even come within cooee." He says the standard exercise manual has been in use for decades, with its variables contained in tables and the degrees of severity to be used decided on the throw of a die. With the user knowledge and experience gained over that period of time, the manual can still handle far more complexities than computers will in the foreseeable future.

"Where the computer scores is in handling real-time. Its formulae can smooth out the clear-edged definitions, the discrete change points in the tables."

Overseas armies have generally worked out their simulations on mini computers, but the Australians were the first to run a fully computerised system on a network of PCs. Their Combat-Sim, written in Modula-2, uses a network of seven AT workstations, each having a particular function and running its own module with laser disk and big video screen, replacing the local terrain board equivalent with map and graphics on the screen.

"The computer formulae can smooth out the clear-edged definitions, the discrete change points in the tables."

"It took them about a year," says Whitworth. "They used the American system for a start, then rewrote it, and the Americans have bought it back for their smaller applications. The problem is that if the computer goes down the whole thing stops, and New Zealand has decided to retain the manual system as well, but we haven't yet decided whether to follow the Australians or develop our own."

The present development at Land Force HQ is not aimed at completely developing a local computer simulation, but instead is an exploratory effort to discover just what will be needed in the end. That's the rationale behind the separate modules, each of which can be written quickly in the first place and later modified to reflect user needs much more easily than one large cumbersome program. And only when a module is in existence does the feedback come from the users, who can provide expert knowledge of realistic vehicle speeds in certain conditions, for example.

"American support has completely dried up, and it makes a big difference," Whitworth remarks. "You can't get away with having nothing. Even buying off the shelf you have to know something about what you want. You have to have a concept in mind of what's needed.

"Our ultimate aim is really to know what is wanted, to define the requirements. We're still at the project definition stage."

"If we've no capacity in New Zealand to develop our own simulations, we've no capacity to evaluate other countries'," agrees Hollander. "Things are changing so quickly that hardware and software are out of date immediately."



Major Brian Whitford thinks up some rotten weather for an exercise simulation.

So the army is not about to equip its long-suffering infantry with laptop portables, and it emphatically does not intend to let its decision-making be taken over by computers. They will be used instead at a lower level to simulate the movement of troops and all the other elements of warfare over terrain, in exercises where the decision-makers themselves have no access to screens. The use of laser-firing rifles and detectors worn by troops in combat training is another field altogether, and one which is being explored elsewhere.

But a spreadsheet-filled screen still falls a long way short of the popular conception of wargames. No wonder the army doesn't like the word. ■

Introducing open software

Apple's new software for the Macintosh is not easy to define and is in danger of being oversimplified. Dennis V. Lally, information officer of Mobil Oil's Information Support Centre in Wellington, explains some of HyperCard's features.

In this age of accelerating development in the computer world there are episodes of innovation which defy easy description. Although a new idea may have simple origins, it may not fit an established niche of ready definition. Call a new product a spreadsheet or a word processor and everyone immediately knows the concept and merely asks for the details or the features, but in describing a concept it is easy to describe the new in terms of the familiar and thus remain blind to a new way of looking at things. HyperCard is such an innovation.

HyperCard is an Apple Macintosh product directly marketed by Apple. Its very name causes initial confusion. HyperCard is software, with no bits that plug or slot into the computer. HyperCard is information software (for want of a better term), but it will probably be compared with or described as database software until it has assumed its own identity. Either that or the definition of the term 'database' is about to be extended.

The name is derived from a theory called hypertext. The rapid development of microcomputers and mass storage systems has suggested to some a new way of handling information where ultimately all the printed information in the world could be made available to any individual, and through the process of hypertext information could be found through association. Thus hypertext would allow links to be formed between separate pieces of information that might not otherwise be seen to be related.

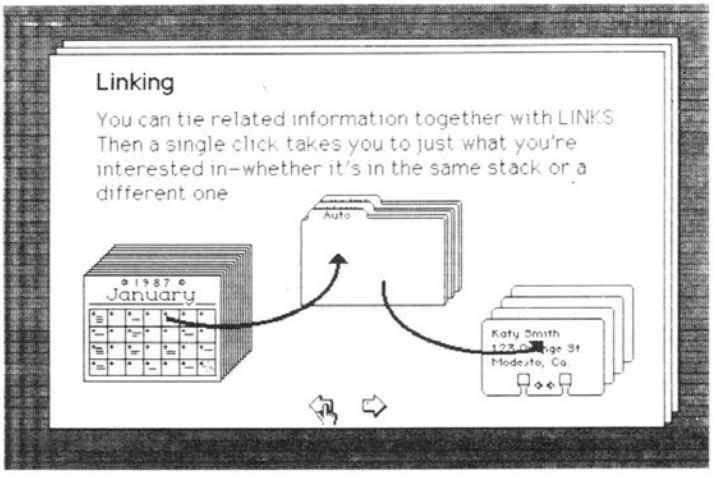
Apple's HyperCard is part hypertext. It has the potential for accessing textual information from any size storage medium and forming links between different bodies of information. HyperCard, however, goes beyond information in the form of text alone and can also deal with graphic images and sound. It is reputed to be capable of animation and video as well.

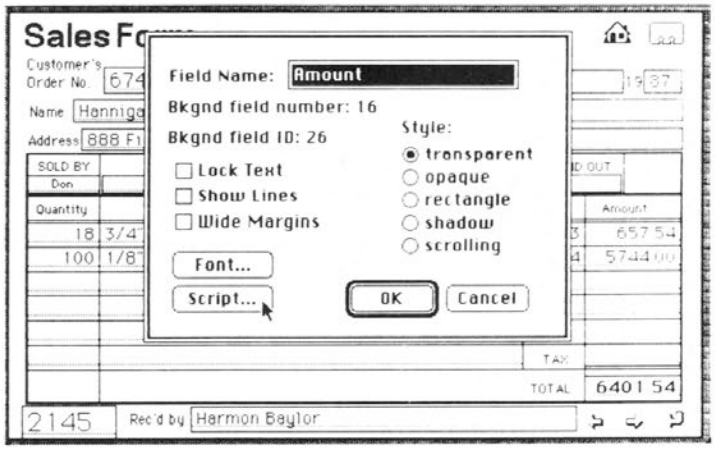
HyperCard's capability may seem somewhat awesome and removed from humble everyday use, so it appears remarkable that Apple is going to give this product away with every new Macintosh and sell it to existing Macintosh owners for less than PC owners pay for their operating system! What is even more remarkable is that the product is so simple in appearance and operation that its potential is disguised and it could be mistaken as a simplistic and limited design.

A simple model

HyperCard is based on a simple model, the rolodex card file. More common in America than in New Zealand, the rolodex file is used on desk for quick reference to names and addresses. Unlike a card index box, which has a beginning and an end, the rolodex file comprises a horizontal spindle with the cards attached radially, and a feature is that although it has a first and last card, it has no end. Once you go past the last card you arrive at the first card, not unlike holding a deck of playing cards and continually placing the top most card on the bottom of the deck.

This may all sound very elemen-





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tary, but it is important to understand the fundamental model upon which HyperCard is based. Although many people often use the analogy of index cards for explaining a traditional database, in reality a database more correctly resembles a table (file) of columns (fields) and rows (records). HyperCard is based on the concept of the index card and the organisation of the index cards into stacks of cards, hence the second part of its name.

In its most elementary form it simply presents the current top card of the stack on the screen. The design, shape, layout and type of data on that card will normally resemble all the other cards in the stack, and moving through the cards in the stack is normally achieved by pointing the mouse at various representations of push-buttons on the screen. Apart from the sorting feature, HyperCard would at first appear to offer little advantage over a manual card file system. It's just as simple, maybe a bit prettier and certainly a lot more expensive if you include the value of the computer.

But imagine having 20 files of cards in boxes on your desk, each one specialised for its own purpose. One might be the obvious names and addresses of people, another might be a calendar with a card for each day (a diary), another might contain the membership of a club, another the bills to be paid, or perhaps all the summary data on the company products and so on.

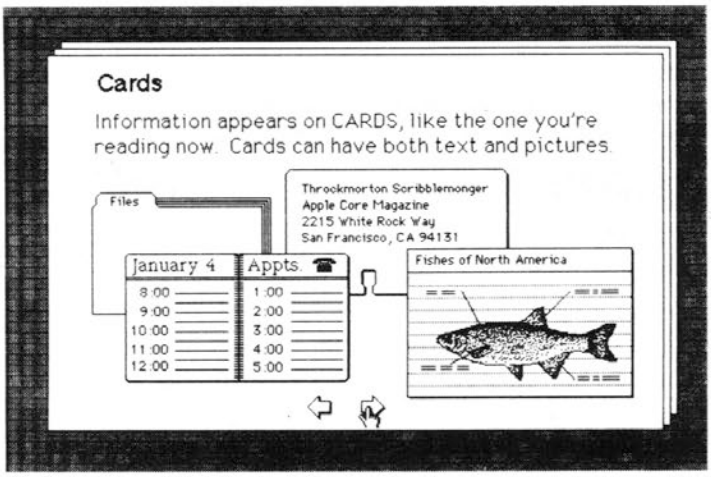
Now imagine each file containing a few hundred cards and a frequent need to go from one file to another to gather related, but dissimilar information. Quite a desk full, and of course only one file would be in convenient reach at a time. Such a system would have its problems when information changed or new information needed to be added. While it might not be too hard to cross out a phone number and write a new one in, it would be tedious rewriting a 50-word synopsis of an employee's performance. Even more annoying would be the ultimate discovery that the file's container was full.

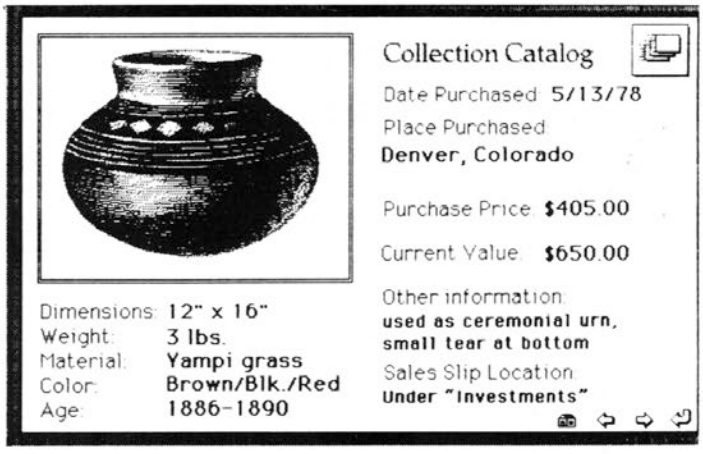
Imagine, then, if there were no limit to the number of files (stacks) you could have and the limit to the number of cards in any file was 16 million cards or half a gigabyte of data (500 megabytes!), whichever came first. As well, every file could be linked to any other file and a lot of your manual activities could be automated, such as dialling the phone or copying information from a document created by another program. Include features such as a painting function more capable than MacPaint and a programming language that is destined to become more popular than Basic for Macintosh users. HyperCard takes a simple idea and removes the restraints that normally keep simple ideas small.

Essential Home Stack

On starting up HyperCard the user is presented with what is known as the Home Card, a screen which contains the names and/or icons of the user's most commonly used stacks. It is not the only way to open stacks, but it is the quickest and, more importantly, it provides something of a crossroads for moving from one stack to another. The Home Card is the topmost card in the stack known as the Home Stack, the one stack which is essential and must always be present in order to use HyperCard, a common point of reference and control for any other stacks. It contains a card that sets five user preference levels which control the facilities available to modify cards or change stack characteristics and indicate the wide range of user activity possible with HyperCard.

Using an existing HyperCard stack is very easy. Each card is really a screenful of information, although with scrolling fields it is possible to have very large amounts of information within a card. Typically, though,





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a card will contain only what is visible on the screen so that cards can be dumped to the printer when hard copy is required. The information in a card is contained in fields, not unlike those associated with traditional databases, but with considerably more opportunity within HyperCard fields because there are no size restrictions on fields nor prescription as to field type. Text, when typed into a multi-line field, wraps around and if too much is typed it simply disappears from view, but is not lost; it can be read if the field is altered by either redrawing to a larger size or putting in scroll bars.

Normally a stack will have buttons in one form or another. The button may look like a push button, but it could be a picture, a part of a picture or even a word. Pushing a button activates a script command or series of commands which carry out the action. To the user this is all transparent; he simply points at the required button with the mouse and clicks the mouse button. Common buttons allow movement among the cards within the stack or searching or sorting, and the most common functions are also on the pull-down menus which follow the Macintosh standards.

A key concept to understand if you intend to start creating your own new stacks is that HyperCard works in two modes. The normal mode is that which allows changing field contents, pasting in graphics or even drawing directly on cards. It is a foreground mode because the shapes, text and pictures that are common to every card in the stack cannot be altered – as if they were covered by transparent plastic. Reaching those elements common to all cards requires shifting into background mode. Normally, when creating a card design for a new stack or modifying an existing one, background mode is used.

It is the first product that can seriously be considered to have encyclopaedic potential.

To create a field, the field tool is chosen, allowing the cursor to draw a rectangular shape as in a drawing program. The field tool is available in both background and foreground modes. The difference is that fields created in the background mode apply to all the cards in the stack and fields created in foreground mode apply only to the individual card drawn on. This feature can catch out the unwary and the manual gives frequent warnings to check you are in background mode when designing a stack's template card. However, the feature is also a deliberate attempt to keep HyperCard as close to its original model and thus natural human practice as possible.

All that applies to creating fields holds true for creating buttons, as well. Button and field tools are given additional capability when the user preference is set at the highest level, programming. At this level it is possible to write, copy and modify the scripts written in HyperTalk. Every button has a script associated with it, and it is useful calling up the info box on an existing button to see how its script is written. HyperTalk is not difficult, but it is rather comprehensive and practice with existing scripts is recommended as the quickest way to get the hang of its colloquial English syntax.

Since buttons are action orientated devices you would expect the scripting facility to be a feature. What is unexpected is that scripts can also be written for fields, cards and even stacks. An example of a field script is a calculation totalling the contents of a series of fields. This explains why the field structure is so simple on the outside: no numeric, text, date or calculated fields. They are unnecessary

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with the option of writing scripts to carry on as many operational and logical steps as required.

HyperCard also allows scripts to be written in an ad hoc fashion using what is called the Message box, a device which reminds me of dBase's dot prompt. The Message box can be present all the time on the screen or sumoned from the menu or by command key. Since commands typed into it are temporary, the user does not need to be operating at the programmer's level. If programmer's preference is chosen, however, you have the option to write commands without the Message box visible.

The HyperTalk language is so fully featured and structured that Apple publishes a manual separate from the HyperCard User's Guide called the Programmer's Guide. I regret that I did not have access to a copy.

I did, however, make extensive use of HyperCard's online Help. True to the program's versatility, the Help facility is actually composed of three related Help stacks, where I found 161 screens of well-organised help on HyperTalk alone. In fact, the total Help facility takes up the best part of an 800kb disk.

Heavy system requirement

This leads me to comment on HyperCard's preferred environment, the minimum recommended being a Macintosh Plus with an external 800kb disk drive. In this configuration I found it preferable to run my system on a RAM disk in order to keep the 1.6 Mb available on the combined disk drives free for the program, which is nearly 400kb, and the assortment of stacks I used for assessing this package. To keep Help on-line left merely 400kb available for other stacks.

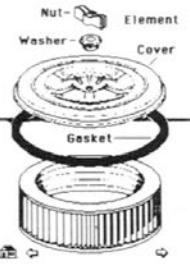
To get the benefit of HyperCard's strong feature of knowing no limits, a mass storage device is required. Mac users with floppy only systems will find HyperCard a useful database alternative, but its 'hyper' qualities will be largely unused. I think HyperCard will generate a lot of upgrades to hard drives.

I have three criticisms of HyperCard. The first is the report printing facility, which allows printing labels and printing reports with fields in columns or in row format. The ease and precision of label printing is unequalled in any software I know, but I found it impossible to print a report which didn't include every card in the stack. An example would be to print a report of all customers with a phone number. After specifying you want customer name and phone number, HyperCard will print all the customers and their phone numbers as well as all the customers with no phone numbers. The selection criteria for report printing are easy to choose, but limited.

The second criticism is a minor one of convenience. HyperCard shows only one card at a time, but I like to be able to use multiple windows for reference and simple data transfer. In HyperCard you need to flip from one card to another. Nevertheless, HyperCard does have the feature of remembering the last 40 cards you used, irregardless of which stack they belong to.

My final criticism is really not directed at HyperCard, but rather at how the product may be perceived by the traditional database user. This person, after a tedious learning curve with a difficult product, measures the facility of a database by its wealth of obscure and intricate features, and may well find HyperCard's tendency to reduce complex commands to push buttons and symbolic pictures somewhat frivolous. What's worse, the powerful ability to employ graphics to make screen representations of spiral bound note books might be dismissed as mere play. Such attitudes reveal more about a person's repressions and less about any genuine concern to advance the use of computers.

HyperCard is going to create a new line in application development. Apple has already anticipated this



and coined the term Stackware. HyperCard is just the sort of product that is so uncomfortably without limits and unnervingly simple in operation that is is going to breed a legion of packages which will essentially be customised stacks for a variety of purposes. Development of stackware will probably keep apace with the lowering cost of mass storage. Perhaps Wise's will put all the New Zealand phone books on a compact disk, especially the yellow pages!

HyperCard is the first product that can seriously be considered to have encyclopaedic potential. It is simple enough through its card and button analogies for a seven-year-old to operate and sophisticated enough with its HyperTalk language to satisfy the serious professional programmer.

I don't think it has the potential to displace traditional relational databases, particularly for business accounting purposes. At least, not yet. My exposure to HyperCard has not reduced my enthusiasm for my favourite Macintosh relational database, Helix. However, it does render many 'flat-file' data manager programs obsolete. As well, it redefines the idea of managing data.

HyperCard is going to spawn a flood of commercial and public domain Stackware. This will be due in no small part to the fact Apple is sowing this product into every Mac user's machine. Its big advantage over any competing system is that everyone will have it.

But that advantage would be short lived if this product didn't have the potential to offer something for everyone. Apple introduced the first open architecture microcomputer, the Apple II. Now with HyperCard it's introducing open software. ■

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Fine-tuning for monetarists

Who wants to be Minister of Finance? Paul Left studies a New Zealand macroeconomic policy simulation package which comes complete with a manual looking suspiciously like a White Paper.

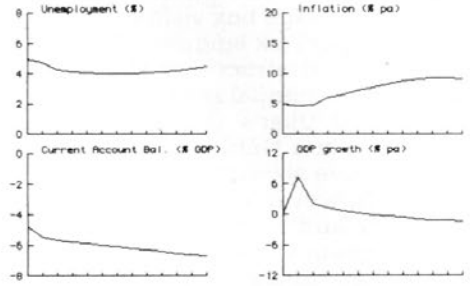
Economics has proved a popular scenario for educational simulation programs because of the ease with which high-level languages handle the interaction of a set of variables. A number of such simulations have appeared for the Apple II computers, mostly written in Basic, at the simplest level of which is the old standard Lemonade Stand, which many children have used and enjoyed while supposedly learning about the laws of supply and demand and the vicissitudes of marketing.

In contrast, Minister of Finance is aimed at tertiary or late secondary economics students and provides a much more sophisticated model.

It is important to note the disclaimer of the author in respect to the function of the program; he notes that it "is not designed to be an accurate forecasting tool". In other words, the model is limited in its scope and the extent to which it represents the New Zealand economy. The aim of the program then seems to be to provide a restricted model which allows students to experiment with the effects of changes in policy instruments on the economic indicators modelled.

The program is menu-driven and provides several discrete functions. The user, as Minister, may view reports, view a set of graphs, or tinker with the economy through the three policy instruments provided: government expenditure, income tax rate, and government stock sales. The term as Minister lasts three years (12 quarters) for effecting any goals, which are not set within the program but as several suggested exercises provided in the manual.

Graphs of the impact on policy objectives at the end of three years owing to an increase in government expenditure in the first quarter.



While this allows greater flexibility of use, since exercises can be set which model a large range of scenarios, it requires the teacher to take a very active role in setting and

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assessing goals. I consider this a very positive feature of the program. It is a pity, however, that the manual offers little in the way of teaching notes and suggestions. Many publishers (for example, Sunburst in the US) are now realising that this is a vital part of educational software packages, without which the software may be poorly used.

While Minister of Finance is a useful simulation, there are a number of areas in which it appears less than satisfactory. In the main these do not indicate serious design shortcomings, but cumulatively they give an impression of software with few bells and whistles.

For example, the program has no Help screens. There is also a lack of constructive error messages when user input is outside fixed limits. It is not enough to inform the user that the number typed is too large; the program should also indicate what the acceptable limits are. Users should not be forced to the manual to find out this sort of information.

Another example of the rather spartan style of Minister of Finance is the way in which the title page is loaded. Most programmers now use a page-flip technique to avoid the venetian-blind effect caused when reading a graphics image directly into the displayed area of RAM. It is relatively simple to use page-flipping to enhance the appearance of programs, and this would certainly give Minister of Finance a more professional touch.

This has no bearing, of course, on the utility of the program and is a minor quibble. The overall effect of these limitiations, however, is to decrease the user-friendliness of the software.

I was puzzled by a seeming paradox in the manual. The author describes three theoretical approaches to economics,and then claims that the software tends to the approach adopted by the present government in 1984, which attributes little lasting effect to policy changes, though with more effect on other variables such as inflation budget deficit and balance of payments. Is this a correct interpretation of government policy? And if so, to what extent is the program's tinkering approach a worthwhile activity?

As it stands, it could prove to be a useful classroom tool for the understanding of macroeconomic decision-making.

One technical problem did occur with the program during evaluation. The manual states that the program is intended to run on 64kb Apple II+, IIe, or IIc machines, and includes a short section on configuration. However, I was unable to run the program on a II+ with an 80-column card, and removing the card made no difference. The problem obviously lay with the startup Basic program which checked the hardware configuration used, and bypassing this program by running the binary program (Minister of Finance was written in compiled ZBasic) from DOS solved the problem. I understand that Quantum will incorporate a modification in all future versions to alleviate this problem. Incidentally, any changes made to the standard configuration cannot be saved.

As it stands, Minister of Finance could prove to be a useful classroom tool for the understanding of macroeconomic policy decision-making. A more complete working model of the New Zealand economy would, however, be widely applicable. There is much potential for enhancement of this package and I would look to the following features as desirable alterations:

A more consistent approach to jargon and a more complete glossary is needed. Some terminology used in the manual was not explained and could prove baffling to some users.

The user should be able to print out graph and report displays, as well as a summary of performance so far. At the end of the program, it would be desirable to have a printed comparison of the economic indicators before and after the user's session. This would greatly facilitate evaluation by both the student and the teacher, and apparently provision is going to be made for printer drivers to produce printouts of the screen displays and summaries.

Some goal-oriented activities should be built-in, without restricting the opportunity for teachers and students to set goals themselves.

The user should be able to enter or choose welfare functions and the program should monitor the success of meeting goals based on these functions. This would enable the program to provide feedback on the acceptability of policy decisions to the population, and accordingly determine the outcome of an election at the end of the three-year term.

A greater provision of notes for teachers and students in the manual would enhance the usefulness of this package in the clasroom.

While the program does have limitations, its relevance to New Zealand coinditions could make it an effective learning aid. Macintosh and MS-DOS versions are currently under development, and I look forward to updated and improved editions to fulfil its promise as an educational tool. At the current price of $49.95, Minister of Finance is an easily-afforded aid to studying the New Zealand economy.

Review package supplied by the publisher, Quantum Enterprises, Christchurch.

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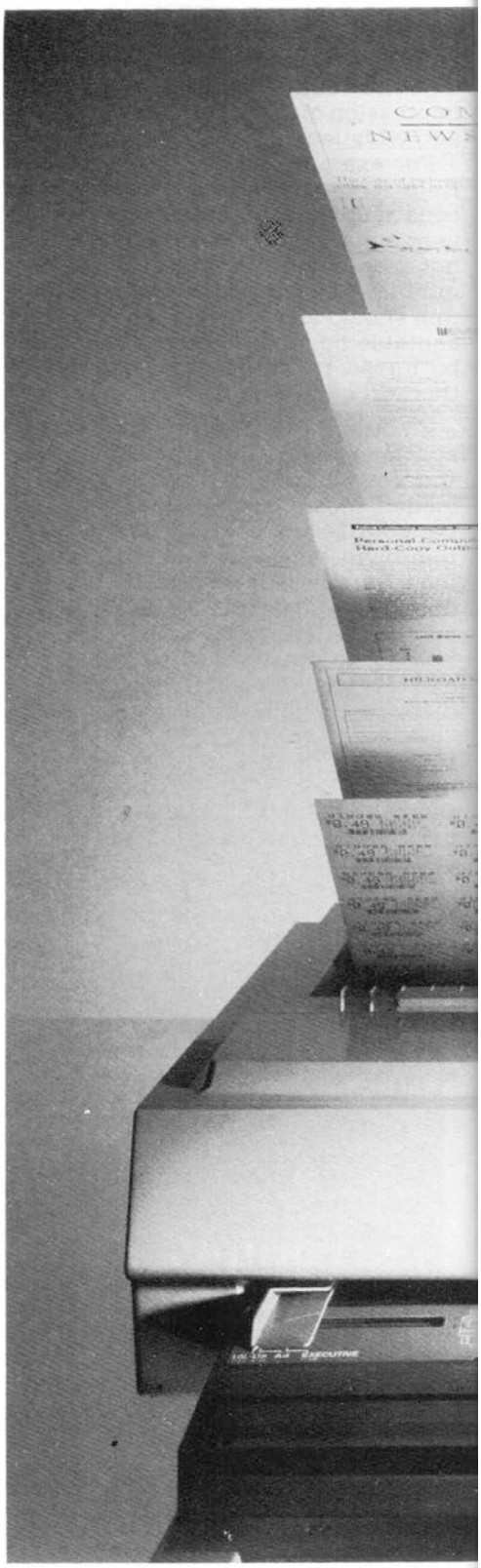
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Non-impact printers from Impact

Far from being the product of a Star Wars movie, laser printers are an example of existing technology which has become increasingly common in the modern office. While they are more expensive than the standard impact types of daisywheel or dot-matrix machines – although the price differential is narrowing – they have a number of advantages including quality of output.



The laser printer is not unlike a Xerox photocopying machine in its operation, but instead of using the reflected light off a paper page, the image is generated by a laser. The laser beam is reflected off a six-sided rotating mirror, through a lens onto a photosensitive rotating drum. The drum, which has previously been electrostatically charged, is altered by the laser beam electrostatically, leaving only the areas representing the printed image charged. Toner is then applied to the drum and sticks only to those areas that are charged. The toner image is then transferred to the paper and heat set in place.

This method is a quick, silent and flexible method of printing, the flexibility being due to the requirement that a whole page of information is stored in the printer's internal memory until the page can be printed in one continuous operation.

While laser printers are typically expensive compared with a daisywheel or dot-matrix printer, they do offer significant advantage. A typical situation would have a printer attached to network of wordprocessor operators, where speed and high quality are required. The high resolution that is possible with a laser printer makes it a requirement for a desktop publishing program. In common with most lasers currently on the market, the Impact printers have a resolution of 300 dots per inch (dpi), but there are printers available with much higher densities and corresponding cost.

As with anything in this world, you don't get something for nothing. Two disadvantages with a laser printer are apparent. Firstly, the printable space on a page: the LS800 prints typically to within 5mm of the edge of the page, while the L1500 can print to 4.2mm. This is not usually a problem considering the typical document does not use this space anyway. The second disadvantage is that since the printer is required to print a page in a single continuous motion, only cut sheet printers are available, but through the use of automatic paper bins this problem is generally insignificant.

Between the two printers being reviewed there is not a significant difference, except that the L1500 has more features than the LS800 and twice the speed.

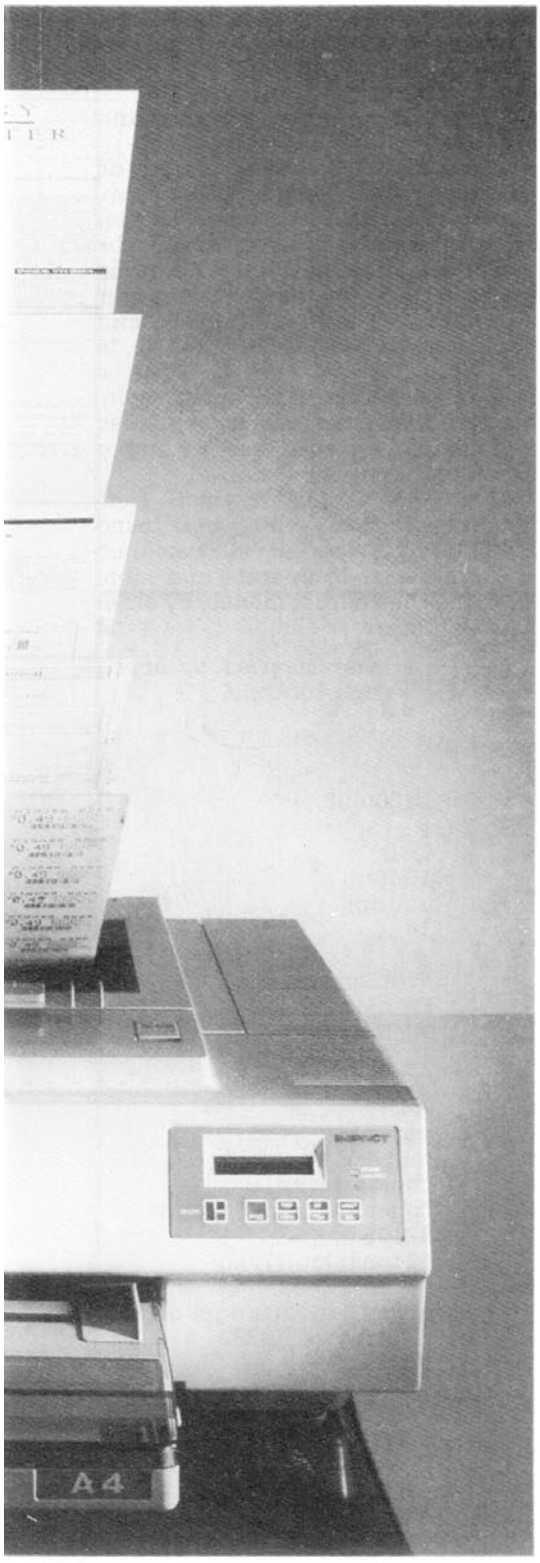
The LS800-III is a general-purpose machine. It is supplied with four manuals, a toner cartridge and a power cable, but requires a data cable to complete the installation. Inside, the machine looks very like a much older Hewlett-Packard LaserJet printer, although it uses the same new Canon engines as the latest HP Series II.

Upon powering up, the machine goes through an internal check sequence, ejects any paper that was halfway through being printed when the power failed, and can print an optional status page if everything is correct. The LCD display on the front of the machine indicates the current machine status as well as displaying a kangaroo jumping across the screen as it is initialising itself. This must be the Australian touch.

By using the front panel and LCD display, startup parameters can be set. These include the software emulation, fonts required, the hardware interface and other miscellaneous details. The printer can emulate six different printers or models including Diablo, HP LaserJet Plus, Qume Sprint and Epson FX-100. The LS800 model 4 version can additionally emulate a QMS Magnum, an HP 7470A plotter and print bar codes.

Up to 9 fonts can be selected at once from an internal library of 31 fonts. Each of these fonts can be varied to include italic, bold, rotated, outlined shaded, double height and width character variations in any

Setting out to capture a fair slice of the local laser printer market is Australian-based Impact Technologies. Peter Ensor test drives two models from the range, the LS800-III and L1500-02, each fitting into a different niche.



combination. The hardware interface consists of a choice between a Centronics or RS232 serial interface, the latter having the usual selection of data formats up to 19200 baud and a choice of handshaking protocols.

Miscellaneous selections include line spacing, character pitch and forms length, while portrait (up and down) and landscape (sideways) printing can also be selected from the front panel. All options made can be stored in an internal battery-backed up store as well as varied by software codes.

As with standard printers, the lasers have the facilities for double-sided printing, if the word processor can print odd or even numbered pages only, as well as having a manual feed facility.

... as well as a kangaroo jumping across the screen as it initialises itself. This must be the Australian touch.

The paper that the printer can accept is not restricted, with adhesive labels, envelopes and overhead transparencies all being suitable. Features that are not standard on non-laser printers include the ability to reprint the page after a page jam, possible because of the page buffering, and the ability to overlay forms onto each page before printing. The form is sent to the printer and stored separate from the page to be printed, and can consist of a combination of text and graphics. Before printing, the new page and the forms page are combined and are printed together.

Bar codes are simple to print also. Using the Graphics Control Language (GCL) of the printer, a command to print bar codes requires only the data to be encoded to be sent to the printer to generate the graphics. Similar commands exist to print bar and pie graphs.

Now as standard comes an upgrade of its internal memory to 2.3Mb, to handle soft fonts as well as graphics and desktop publishing functions. The increased memory is needed to print a full page of 300 by 300 dpi graphics, and makes it the lowest of the non-PostScript compatible machines for dtp use.

Twice as much

The L1500-02 is significantly bigger and faster, with a weight twice that of the other printer and a speed of 15 pages per minute instead of eight. The review machine was supplied with additional emulations, namely a TI model 855 emulation and the PostScript page desciptor language, which has two modes of operation: interactive and batch.

When using PostScript a two-way communications link is required between the computer and the printer so that the printer can supply completion codes back to the computer. Two methods are permitted for this communication. The first is to use a serial interface in the normal fashion, while the second is to send the data to the computer via the faster Centronics interface and send the information back to the computer over the serial interface. The printer supports three serial interfaces: the common RS232-C, RS422 and Appletalk.

The fonts available from the internal selection include times, courier, helvetica type styles as well as a symbols font. This, like the other printer, could be supplemented through the use of plug-in cartridges and each font could be varied as before. The L1500 printer has two paper feed trays, each able to hold 250 sheets, with the facility to automatically swap between the trays when the paper in one is exhausted.

Unlike the LS800, the L1500 has a separate rotating drum and toner cartridge. Whenever the toner is exhausted in the smaller printer the drum is replaced as it forms part of the toner cartridge. As this drum is a precision item the toner cartridges are expensive. With the larger L1500 printer the separate drum and toner will result in a lower running cost and offset the higher initial capital cost.

Simple to use

Using each of the printers was simple, with the front panels straightfor-

ward in operation. The LCD displays were a problem when trying to view them from above or from the side, as occurs when seated at a terminal and requiring to check the status of the printer.

One important use of the display was to check if the printer was online. To this point the LS800 had an additional online LED while the L1500 eliminated the need to take the printer offline to force the printing of a page.

Both printers were reasonably quiet in operation, especially when idling. However, the larger printer fan was significantly louder than the LS800 and an HP LaserJet that the Impact printers were being compared against. When printing, the larger machine also tended to rattle.

All options can be stored in an internal battery-backed up store as well as varied by software codes.

The manual feed hopper on the smaller printer was excellent with the ability to stack several pages in the hopper at once, while the L1500 required a hopper door to be opened and the paper inserted. Both were definitely better than the continual removal of paper trays to insert another type of paper that is required on other printers.

One thing that was annoying with the L1500 was the thinking time it required. Whenever the printer was reset, from any of the power on, front panel or Centronics cable sources, the checkout time of 60 seconds appeared long. When this occured the computer would be ready to print a page well in advance of the printer being ready. It also took time out to think when it struck a new font. Such an occurrence would typically be at the beginning of the day, but once done the 15 pages per minute printing speed was maintained.

Print clarity of the smaller printer was better than that of the L1500, which suffered from the characters becoming fuzzy towards the two sides of the page, but it is expected that some minor adjustment or cleaning should rectify this. Comparing the characters of the printer with that of the HP LaserJet, the Impact's were much thinner and clearer, but the bold characters were formed by offsetting the character and reprinting it. This resulted in the tops of circles being thinner than the sides, unlike the HP charactes which were uniform in width.

The changing of the toner cartridges and optical belts was simple and easy, and the LS800 had the advantage of accepting Canon cartridges.

All three printers were attached to a network and assigned identical printer descripter tables. The LS800 could not be faulted in its emulation of the HP LaserJet, but the L1500 failed to underline between tabs, a problem which is being addressed by the manufacturer. The Plotter emulation of the L1500 produced a reasonable printout, but is doubtful that the 300 dpi resolution was maintained as some of the lines had noticeable steps in them, not to be found in the circles drawn.

One change that would be an advantage to the L1500 printer is the ability to be able to request the printing of a partially completed page while in the Plotter emulation. In the other emulations, pressing the Form Feed key forced the printer to print the page as it was stored in memory. This was required whenever the last character sent to the printer was not past the last line on the page or consisted of a form feed character. In the Plotter emulation the form feed key could only be pressed after the reset key, which resulted in blank pages being printed.

The manuals for both printers were good. The number of manuals received appeared to be inverse to the amount paid for the printer and those for the L1500 had the Texas Instruments name and logo spread over them.

The LS800 manuals were simpler in presentation and came with a quick reference card, which would be useful for programming but proved unnecessary when programming the front panel. Those for the L1500 were more compact. The first manual consisted of the day-to-day running procedures as would be required by the operator, while the second was the programmer's manual.

The LS800 manuals could do with the diagrams for cabling the serial interface, as was provided in the L1500 manuals. The L1500 interface was involved and in no way represented what was required for the other printer.

Overall, the impression of the printers was good.

The LS800 was preferred, partly on cost and partly because it was simpler to use and had a much smaller footprint than its big brother, but the L1500 would be the choice if printing speed or the PostScript language was a requirement although a PostScript version of the LS800 is on the way. In choosing between using either a laser or a daisywheel printer in a commercial office, the quietness, speed and flexibility of the laser is a strong consideration.

The Impact (as distinct from impact) printers, while not being revolutionary, appear well designed and are easier to operate and more versatile than earlier models by other manufacturers. ■

Review machines supplied by Impact Technologies Ltd, Auckland.

Printer Summary

Name	LS800-03	L1500-02
Manufacturer	Impact Systems Ltd, Sydney	
Display	LCD	LCD
Print speed	8ppm	15ppm
Resolution	300 dpi	300 dpi
Internal fonts	9	14
Fonts areas	31	—
Emulations	Lineprinter, Diablo HP LaserJet, Qume Sprint, Epson FX100	PostScript, Diablo 630, HP LaserJet+, HP7475A Plotter
Paper sizes	US letter, US legal A4, B5, executive	US letter, US legal A4
Options	paper tray $187 font cartridge $770 typ dual bin & env $4070 toner cartridge $308 (4000 A4 prints) word processor printer drivers $30	paper tray $138 font cartridge $798 combo pack of consumables (40k prints) $2195 12 toner kits (72kb prints) $2692 emulation cartridges $700
Interfaces	Centronics, RS232	Centronics, RS232 RS422, Appletalk
Noise level	less than 53dbA printing less than 43dbA idle	less than 55dbA
Power supply	900 watts	1000 watts
Dimensions (mm)	434x482x232	546x724x445
Weight	20kg	40kg
Price (excl. GST)	$6,970	$17,995 $12,995 without PostScript

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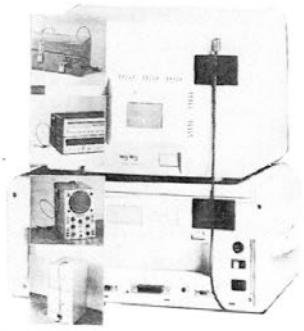
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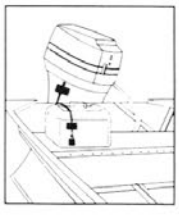
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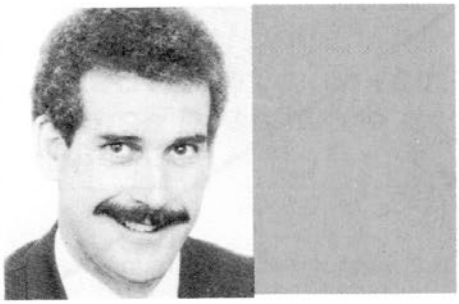
Games people play

The desktop personal computer can be more than just a business tool. A huge number and variety of games are available for playing on the PC, and that activity is taking over from the executive practising golf putting in his office as the butt of cartoon humour.

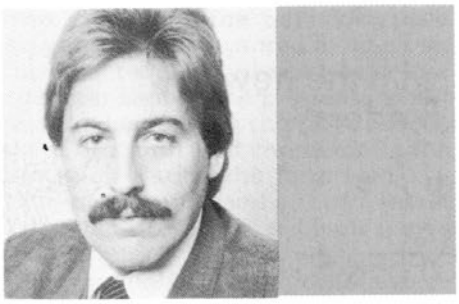
Just who plays games on the computer? Is it the frivolous type, or is it the sort of person who feels comfortable with the machine and wants to get more out of it, at the same time being able to relax and get away from the office routine?

There's no doubt that some people feel guilty about playing computer games, and there apparently exists a piece of software that will instantly, at the touch of a certain key (presumably not the Fire button), bring up a simulation of a spreadsheet on the screen at the approach of the boss. Of course the worker supposed to be beavering away at a word processor might have some explanations to make, but no doubt a variety of such software will become available in time.

But not everybody has to listen for the gentle footfall of the boss. We asked some of the bosses themselves, those well up in the computer industry, about their favourite computer games and what their staff play in their spare time...



Chris Angove, Honeywell Bull: "The only one I've really played is Flight Simulator, but I don't generally play games because I've no PC at home at the moment. I'm currently in the process of buying a PC – Honeywell of course – particularly for my 17-year-old son, and I've no doubt I'll then become an expert on games."

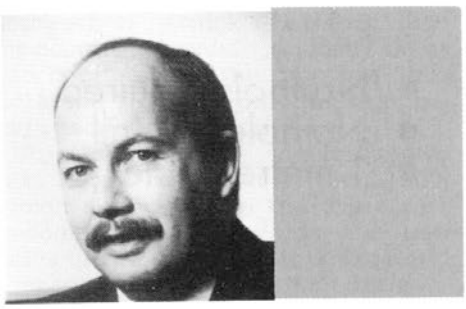


Paul Dixon, Imagineering: "I don't play very often, but when I do, it's with my 11-year-old son on a Mac Plus at home. We play The Leather Goddesses of Phobos, a spoof of sci-fi of the 1960s era, a text and graphics adventure game. The other one is Comic Works, which puts graphics characters into comic form, and you write your own text."

And at work? "They play very little – I haven't seen anyone playing games for a long time. I like to think they're too busy for that."



Dick Anderson, Commodore Computer: "I don't normally play games – I'm not very good at them but I don't like to admit it. The only one I really play is Shanghai, an ancient Chinese game. The Commodore 64 version is an optician's nightmare, but on the Amiga it's brilliant. Arcon is popular here, with the occasional dabble at Marble Madness. There's the odd contest when the staff stay behind for a few beers."



Greg Magness, Barson Computers: "I don't play any games on the computer. Podd, an educational tool, is the only piece of software I've ever looked at on a BBC. We use spreadsheets at work as a productivity tool." (He has, however, been seen by *Bits & Bytes* playing with Lego.)



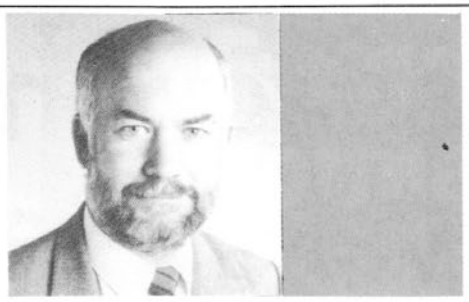
Brian Eardley-Wilmott, of Brimaur Computer Services, has only a Macintosh on his office desk and admits to playing only one game – Blackjack. "My attention span for games is small, and I don't relate to the adventure type."



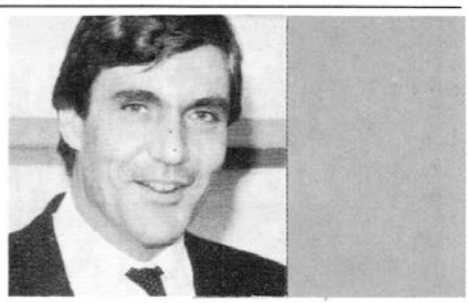
Brian Grounsell, NEC: "I guess Flight Simulator is the only game I've really played. Games are available in our software here, but nobody seems to play much. I don't know whether it's a novelty that's worn off, or what. The one I did enjoy most was Flight Simulator."



Martyn Coe is a pilot when he's not running AWA Computers, so his choice of game is not surprising. "Flight Simulator is really the only one I bother with." Why play the game when he can do the real thing? "When I wake up at 2 or 3 in the morning I can't do the real thing without making special arrangements. I'm not a great games fan. Chess I play a bit, but it's frustrating because mine has a bug in it and I can beat it every time now that I know the bug."



Mal Thompson, CED, plays mainly Mac Golf. "I'm not a great games player, and not a Mac person naturally – I use the office system which is an AWA mini running Pick. There's a pretty low penetration of games in CED. The (games) market hasn't improved much in two years, and people have done them and moved on. So many other new products are coming out – not games – that they spend their time at home learning the tricks of them."



Peter Thompson of Data General is another who says he doesn't play games at all. "Playing with computers in my free time is abhorrent to me – which is not the sort of thing I should admit when trying to sell computers. About two years ago I just about mastered Pacman, but these days I am more into fence posts and other rural things in my spare time."

So, from what they tell us it seems that many of the senior execs in the computer industry are not enamoured with the games that capture the imaginations of us lesser mortals.

Here at *Bits & Bytes* we know differently: at our annual shows around New Zealand we see many executives gathered around the machines displaying the latest and most innovative games, and during the three days of those shows many of them show an aptitude that outshines the skills of the most talented self-confessed games enthusiasts.

We also realise that as with any learning process, young people are going to be attracted into activities that have a games element, not because they are unable to participate in straightforward processes, but because they learn more readily if they are enjoying what they do. Therefore we believe it is important to foster that positive enjoyment of the computer, an enjoyment that develops skills far broader than mere computing ability.

Games foster logic, patience and co-ordinating skills; they assist in reading and comprehension; and they positively reinforce achievement.

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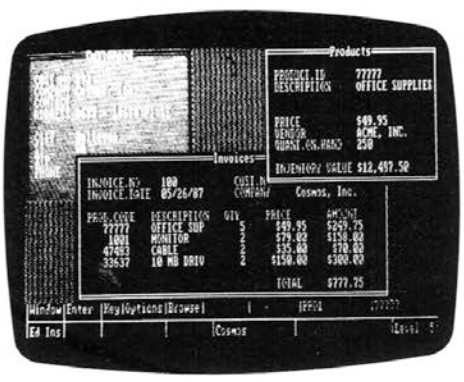
Advanced Revelation styles itself an "Applications Environment" rather than a DBMS (DataBase Management System), and its main feature is generation of windowed application software. It is a complex package full of facilities, and even includes a communications module. It has record locking, which enables it to work properly in a network of simultaneous users.

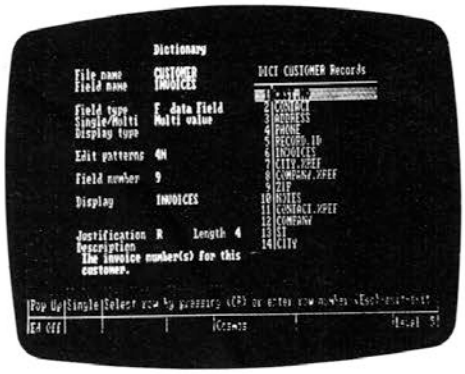
To understand where Advanced Revelation (ARev for short) fits into the market, imagine a business that cannot be squeezed into a standard accounting package, and has one or two computer literate senior staff with time on their hands (!). Perhaps an outside professional is busy customising a set of accounting programs written in ARev.

Meanwhile the staff members are experimenting with their own data storage and retrieval ideas using ARev's tutorial manual. With some professional help, these will be eventually integrated into the system, and whenever some new simple report is required, the staff can provide it without professional help. Ongoing development by the end user is one of the major strengths of ARev.

Feel at home

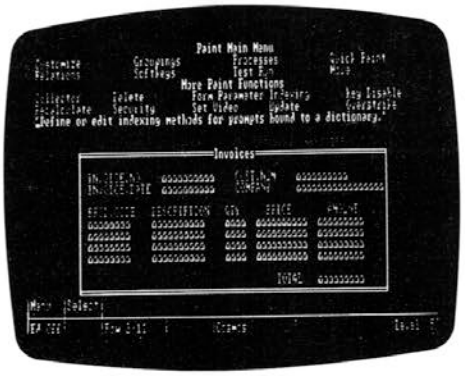
ARev has a terminal command language (TCL) which runs file utilities, application generator windowing utilities and your programs. A DBMS user will feel at home on finding a command like SELECT CUSTOMERS WITH CITY = "NELSON". From this TCL one accesses the facilities of R/Basic, a powerful language which compiles code to be run by the TCL, but not by MS-DOS. A massive system of menus and help popups gives alternative access to most of the TCL's utilities, which themselves (especially those for file and window definition) are presented using help popups and superimposed windows. This kind of presentation is very popular, but I found myself wallowing in windows of infinite variety. Perhaps a basically good idea has been a bit overdone.





In common with most DBMS, ARev uses dictionaries for field typing. To understand the role of dictionaries, consider the standard file definition dictionary concept. When defining the fields of a file's record, the user sets various parameters in the file's dictionary. The parameters typically describe location in the record and aspects of presentation, such as text justification and use of "$". This technique is part of a major advance in language concept involving parameterised code.

A file re-definition is then made via one change in a dictionary, rather than a dozen changes in code. (By contrast, in Basic a file definition is part of code as a FIELD statement.) What is distinctive about ARev is that it uses this sort of approach to menus, and windowing.



ARev's approach allows for quick design and modification of an application window, which is its central concept. The window allows one data file to be edited, while contents of related files may be displayed, and the window consists of text and "prompts", which have many parameters attached. Prompt types include fields from the data file, non-editable fields from other files, or symbolic fields which calculate automatically from a user-supplied R/Basic program that is attached to the prompt as a parameter, an excellent feature.

Setting prompt parameters is also the way to attach a popup for help with data entry into that prompt. For example, in an invoice entry program, a popup could be created to help choose a customer code by using an index search on the customer file.

The numerous facilities available in the above style cover most requirements for accounting programs. However, grasping the extent of these facilities is a major task, partly because so many are particular features designed for a particular aspect. (The previous paragraph has examples).

I feel that in many cases one could replace a bucketful of particular features with a few general simple powerful concepts. One such concept is the database, regarded as a family of files with links between fields such as the customer code field. ARev's concept of Relational Indexing is a useful step in this direction, but it has not been developed enough to help with this.

The concept of database (rather than file) as basic unit is an important fourth generation language (4GL)

feature. A practical reason is that the programmer should not have to be always thinking of individual files and arranging some kind of integration separately for each application. An attempt to fit windowing into a 4GL surely has to regard a set of superimposable windows as a single concept – the user presentation of a single database – and the links between these windows should be derived from the links between the files of the database.

Given a reasonable supply of basic routines using windows, integration of the various windows would be a consequence of one's choice of database and one's selection of a set of windows. Multi-file windowing would then be a general feature, rather than a set of particular features such as popups. The point is that a lot of ARev's complexity, particularly the number of parameters, can be directly attributed to failure to think right through some of these 4GL conceptual issues. Perhaps future versions will make further progress in this area?

The above criticism holds true for most micro DBMS packages. But most lack ARev's features, so there is nothing available that could be overcomplicated by failure to attend to 4GL conceptual issues. If simplicity, power and versatility are all demanded then the foundation must be a limited number of simple and powerful basic concepts.

ARev's approach allows for quick design and modification of an application window, which is its central concept.

A murky conceptual basis combined with power leads to over-complexity, which seems to me an endemic problem with a lot of mainframe and mini software. A useful analogy is the comparison between a clear mountain stream and a huge river, which tends to be murky. We want a huge crystal clear river. Significantly, ARev's pedigree goes back to the Pick environment on minis. Son of Big Murky?

New operating system?

As with any DBMS, the utilities accessed via the TCL begin to look like a new operating system (O/S) built on the ruins of the native O/S. This aspect is very prominent with ARev as the utilities are so extensive and so unlike those of MS-DOS. With

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ARev this new O/S is like a subset of Pick, which is very different from MS-DOS or Unix.

Some of the different concepts and facilities are helpful additions to a DBMS, for example the extensive password access control and the variable length fields and records. But having to deal with "volumes" instead of subdirectories is a nuisance for experienced MS-DOS users, because there are many subtle differences. It is a bit annoying having to learn a new O/S just because your DBMS designers love Pick. In order to bring you Pickthink it is necessary to cut many ties with MS-DOS, and in particular all files are given new names, with Pick rules for valid names.

A useful analogy is the comparison between a clear mountain stream and a huge river, which tends to be murky.

A "media map" makes the connection between new and old names, an advantage of which is longer filenames, but in my opinion, it would be possible to keep all ARev's important innovations while retaining MS-DOS file naming conventions and directory structure.

As a result of the above design decisions there is a large amount of overhead eaten up by duplicated O/S functions. Pick has its own style of buffering all those files which are already buffered by MS-DOS. This is one of the reasons ARev is rather slow.

Language capabilities

ARev's procedural language is called R/Basic, which is similar to Pick Basic. It has far more facilities and language features than dBase III and is compiled (to be run by ARev's TCL). R/Basic is free from line numbers and features Matrix handling and named subroutines (functions) to which one can pass parameters.

Pascal and C programmers will find it much less repellent then most versions of Basic. Many parameter-passing problems for the novice user are avoided by storing all variables as strings, even the numeric fields of a disk file being stored this way. It is this feature which enables ARev to allow variable-length fields and multi-valued fields, since delimiters can then be used to mark record and field boundaries.

Because of this, ARev has potential as a text database system. It is particularly useful to be able to enter comments and descriptions of arbitrary length into structured data files. The multi-valued fields allow one to avoid the extra files that a traditional flat-file relational DBMS must use to deal with many-to-one relationships, although this is a topic where a proper database concept would eliminate the awkwardness of extra files and make multi-valued fields less attractive.

ARev's design decision concerning variable length fields and string variables has many advantages and disadvantages. It favours certain uses, and it is no accident that a library is using it. A file full of large non-zero numbers takes up more space in ARev, but if most of the numbers are small or zero, it takes up less space. Time is wasted in the more difficult problem of allocation of disk space for variable-length records. More time is wasted in the strong processing needed to isolate fields within records, and finally these strings are copied repeatedly during the parameter passing that occurs between many of ARev's internal arithmetic functions.

Together with the extra O/S overheads, these aspects are responsible for ARev's slowness. I don't like wasted resources, but I have to admit that it may not matter on the 80386 machines that are coming.

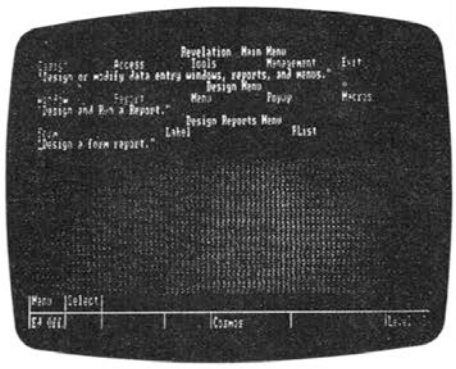
Relational features and indexing

I have already grumbled about the lack of the database concept. The lack of it in most DBMS is compensated by the ability to program a join of files using ISAM indexing calls. As an example, take batch processing of invoices. In a traditional DBMS one can bring an invoice record into memory, then bring a related customer record into memory, using an index call of the species:

FIND FILENAME FIELDNAME
FIELDVALUE.

The customer's balance can then be updated.

Such a call would be fundamental to most DBMS designers, and while ARev allows an index on any key, the above species of call exists only for a primary key. Suppose, just for illustration of the different programming style, that the customer code is not the primary key of the customer file. One would SELECT CUSTOMER WHERE CODE = ... The SELECT routine would discover that an index could be used to help with this particular where-clause, and would place the primary key of the selected record in a special buffer. An index search on this primary key would



complete the operation in a style that is rather convoluted for this task.

ARev's style generally is to create lists of primary key values for later processing. The SELECT command is only one of many ways to form such lists. Another way is through a feature called Quickdex, which when activated automatically keeps a list of keys of processed records. The capabilities of this alternative approach are not in question here – only its style.

ARev has other indexing features of interest, particularly Cross-Reference Indexing, which enables searches to be made for a value in a delimited subset of a field. This would be very useful in text database applications.

More facilities than most

ARev has more facilities than most other micro DBMS rolled up together. It is a fine program generator of applications using superimposed windows and popups, and for a combination of professional and end-user developments, it is as good a package as any available for MS-DOS. It has a powerful "Structured Basic" compiled language, while good manuals and extensive menus and popups help the user cope with what I consider to be over-complexity, within a slightly muddy conceptual framework.

But even the less powerful earlier versions of Revelation have hundreds of happy users across the country, with able technical support. Beginning users can create simple applications easily using an excellent tutorial, while professionals are available to help with large developments and advanced features. For most users this may be more important than elegance of language concept. ■

Dr John L. B. Gamlen is a research mathematician and principal of Eureka Systems, a consultancy covering science, computer systems design and software engineering.

Review package supplied by TechTonics Group Ltd, Wellington.

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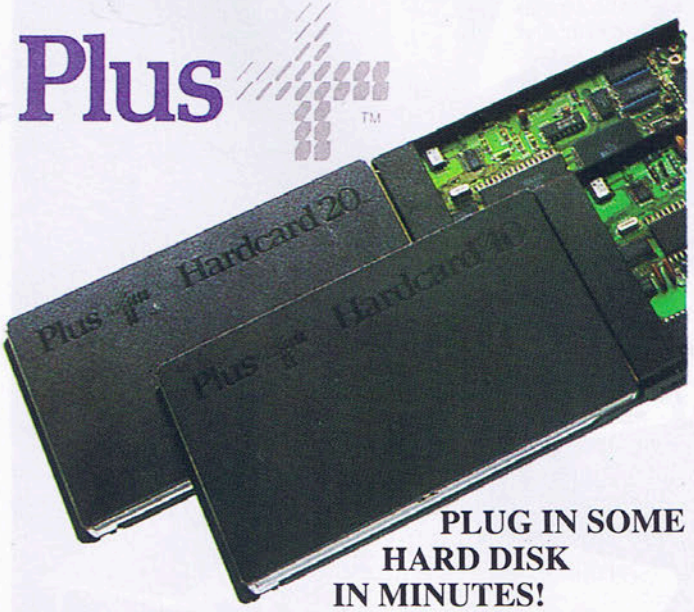
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Enhanced liquid crystal clone

by Mark James

In the March 1986 issue of *Bits & Bytes* we reviewed the Sharp PC-7000, one of the first LCD-display computers to claim near-IBM compatibility. The successor to that machine is the PC-7100.

Like the PC-7000, the PC-7100 is shaped like a sewing machine: 215mm high, 410mm across, and 160mm deep. From one side a keyboard folds down and a screen pops out. The keyboard is detachable, having a coiled cable with an RJ-11 connector on either end to attach it to the main unit. The other side, with ports for serial and parallel devices and for an optional external monitor, is also where the optional thermal printer hooks on for carrying. On top is a padded handle that slots into either of two positions (depending on whether there is a printer or not).

The whole unit weighs 8.65kg without the printer, and 13 kg with one. It is definitely not a laptop, unless you have a very unusual lap.

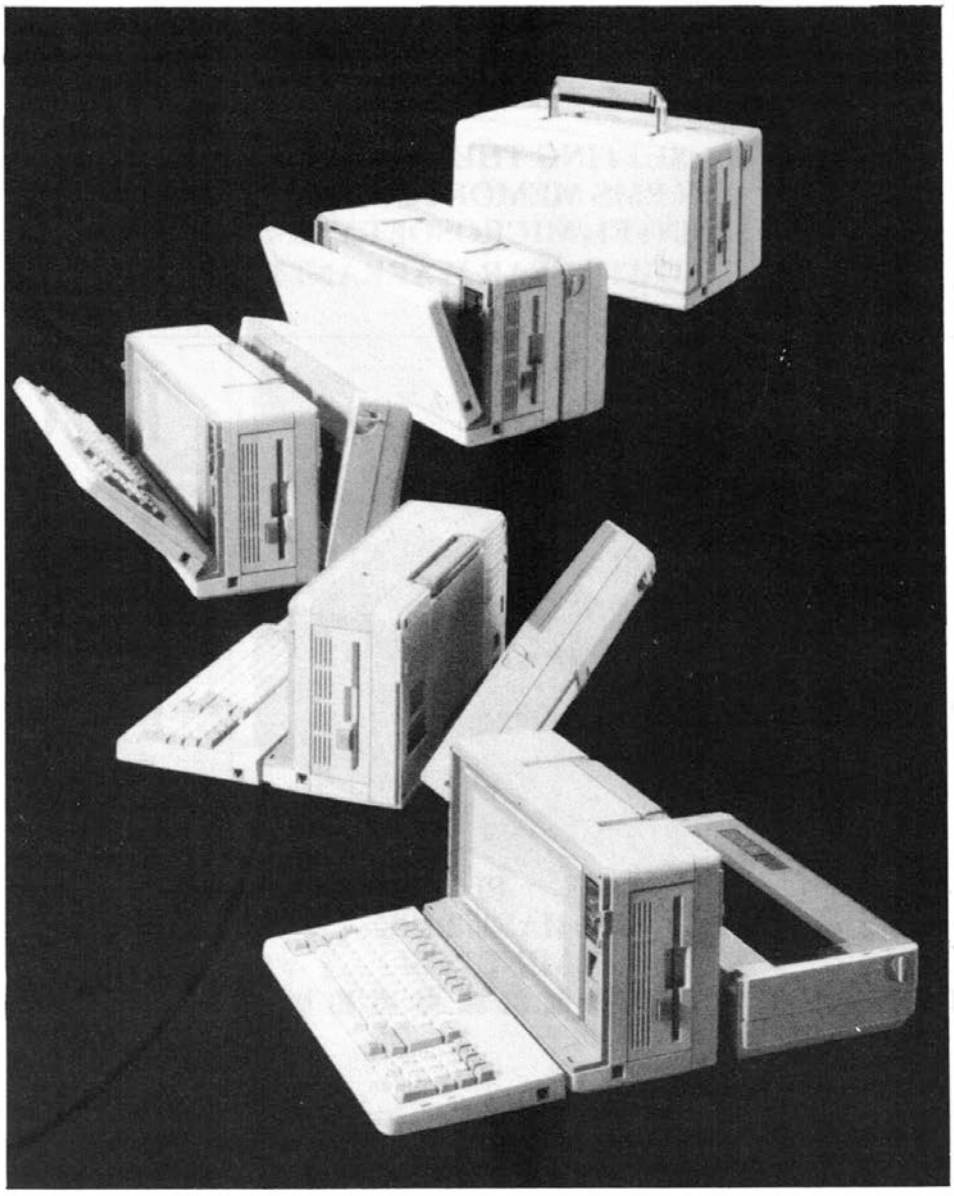
There are four essential differences between the PC-7100 and its precursor. The most important is that it has a hard disk, which replaces one of the PC-7000's two floppies. Secondly, the 640-by-200-pixel screen now uses supertwist LCDs (liquid crystal diodes), instead of the regular LCDs (similar to those in Sharp's digital watches and calculators) found in the PC-7000. Supertwist LCDs greatly enlarge the viewing angle within which the screen is legible. Thirdly, both the ROM BIOS and the Sharp version of MS-DOS have been improved in order to eliminate the few remaining incompatibilities with IBM's now-abandoned PC-DOS. Finally, the machine now comes with bundled software: a menu program called Direct Access, Borland's Sidekick window utilities, the Xtree disk file management routine, and MS-DOS version 2.1, with 3.2 available on request.

Two manuals come with the system: the *Personal Computer PC-7000A and PC-7100 Operation Manual,* and the *Personal Computer PC-7000 MS-DOS Manual,* the latter said to have been replaced recently with one devoted specifically to the PC-7100. Both manuals are reasonably well-presented and indexed, although neither goes into much technical detail. (There is an optional *Technical reference Manual* which may fill this need.)

Slightly faster

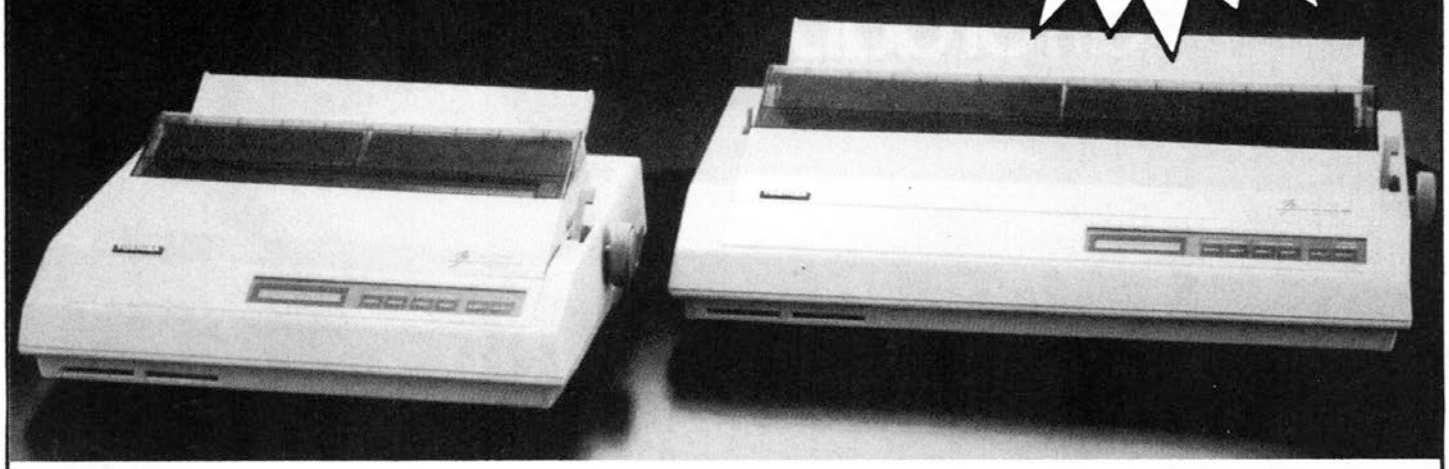
The computer's processor is an Intel 80C86, a low-power CMOS version of the 8086 chip. It runs at either of two speeds (selectable from the Setup screen, described below), a "normal" 7.57MHz and a "slow" 4.77MHz, the latter intended for the few programs that require absolute compatibility with the original IBM PC. In fact the faster speed is somewhat slower than the 8MHz at which most clones run, but then the 80C86 chip is itself slightly faster than the usual 8088 found in rival machines. All in all, the computer's performance

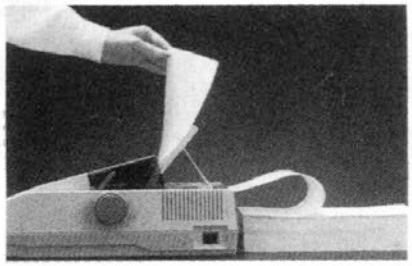
(continued on page 37)



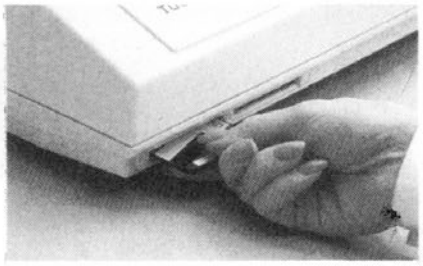
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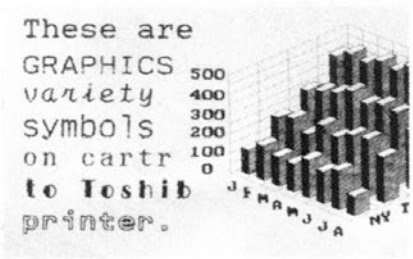




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(continued from page 34)

is similar to that of most PC/XT clones.

The hard disk on the PC-7100 is actually a 20-megabyte Hardcard, the well-reviewed hard disk built into its own controller, manufactured by Plus Systems. This type of disk is usually plugged into a computer's expansion slot, but since the PC-7100 has none, Sharp has incorporated it into the body of the machine. The disk itself is a 3.5-inch Winchester with 50-millisecond access times, ranking it about in the middle of the range of its competitors.

Other models in the range are the twin-floppy PC-7000A and the PC-7140, which has a 30-millisecond 40-megabyte hard disk.

The LCD screen, while it reduces power consumption and eliminates the need for a separate screen on the desk, does present some problems. All LCD screens have a restricted viewing angle; if you do not face it straight on, the screen image is weak. This was a problem with the original PC-7000 screen, but is much less so with the PC-7100, thanks to supertwist technology.

Another problem with LCDs is contrast, as anyone who has tried to read a digital watch in dim light will know. The Sharp PC-7000 was one of the first LCD screens to solve this problem with an electroluminescent backlight, and the PC-7100 uses the same electroluminescent membrane, now in a choice of three colours: green, blue and grey. I experienced no eyestrain whatsoever with this screen, even after hours of work.

Better than many

Sharp's LCD display is thus better than many, as one might expect from a company with as much experience in LCD as Sharp has. Some problems remain, however. The screen, made of 640 by 200 LCD pixels, seems to respond even more slowly with supertwist pixels than with the older style. Games are often quite hopeless, the moving images nothing more than a blur. Also – and this is a problem common to all LCD screens – the pixels are not square. In fact they are not even close, the aspect ratio being worse than 2:1. This means that normal-looking images on CRT screens appear squashed when displayed on an LCD screen, but these problems, while affecting graphics, are less important for ordinary text display, which is very legible.

The keyboard is of the 84-key variety, similar to that of the original IBM PC/XT except that the CapsLock, NumLock and ScrollLock keys have LED indicators, and the 10 function keys are arranged along the top of the keyboard, in groups of five, instead of along the left. I found the arrangement of the function keys somewhat irksome, perhaps because I am used to twelve of them arranged in groups of four. The keyboard is slightly sculpted for typing comfort, but the keys themselves are not very springy.

One special key not found on most keyboards is marked Set Up. When pressed, this invokes a ROM-resident set-up program which manages the system date-and-time clock (which comes standard), serial and parallel port configurations, processor speed, display characteristics, backlight intensity, and even the loudness of the beep. The settings are saved in non-volatile memory.

The set-up program will also manage the optional internal modem. This is an Australian-developed 300/1220-baud auto-answer unit that is claimed to support both the American Bell and the New Zealand CCITT standards, but of course before local type approval is granted the Bell side will have to be disabled. The review machine did not have a modem.

It did, however, have the optional CE-700P printer, one of the unique features of the machine. It has a small footprint (215mm by 410mm) and latches up against the main unit for carrying. The Sharp brochures call it a "very near letter quality" printer, and the claim is justified. On its special thermal paper, the print quality is as good as a 300-dpi laser printer. It can also print on ordinary paper, but requires a special thermal ribbon to do so. Although the quality is not as good this way, it still rivals the best of its 24-pin dot-matrix competitors.

The printer works best with single-sheet paper rather than continuous forms. It comes with two fonts (selectable from the Set Up key), and two more are optional. The print speed is slow, but my only real complaint about the printer was that it added just enough bulk to the computer to make it a pain to carry around. Without the printer, carrying the PC-7100 is like carrying a suitcase; with it, it is like carrying a computer.

One other option is worth mentioning. There is an expansion box which fits underneath the main unit and provides three IBM-compatible expansion slots (two long and one short). A second Plus Hardcard, for 20 or 44Mb of additional disk storage, may be installed in an expansion slot; or, alternatively, it may be installed in place of the expansion box itself.

Solid quality

Given that the sharp PC-7100 is based on older, PC/XT-type technology, its price would appear a bit high, as you can even find IBM machines for less, and clones for much less. To be fair, of course, these machines tend not to be portable, nor do they have the bundled software that comes with the Sharp. Sharp's reputation for solid quality must also count for something.

The PC-7100 is by no means a fast machine, nor are its keyboard and LCD display perfect. However, its vertical arrangement and compact printer give it a small form factor, which will be of great appeal where desktop space is at a premium. It showed no problems with IBM compatibility, in spite of such additional features as the Set Up key.

And the quality of the printer suggests that Sharp could make a lot of money just selling those. ■

Review machine supplied by Pegasus Systems, Auckland.

Microcomputer Summary

Name	Sharp PC-7100
Manufacturer	Sharp Corporation, Osaka, Japan
Microprocessor	Intel 80C86; 4.77 or 7.37 MHz
RAM	384kb standard, expandable to 768kb
Disks	one 5.25-inch 360kb floppy drive one 3.5-inch 20Mb hard disk
Display	backlit LCD display, 640 by 200 pixels
Keyboard	84 keys, including 10 function keys, a numeric/cursor keypad and a Set Up key
Connectivity	one RS-232C serial and one Centronics parallel port
Operating system	MS-DOS 2.1 (bundled)
Bundled software	Direct Access; Sidekick; Xtree
Base price	$5950
Options (all excl. GST)	CE-700P printer, $995 internal modem card, $750 CGA plus Hercules graphics adapter, $395 expansion box – price not available carry case, $266 twin-floppy PC7000A model $3950 40Mb hard drive PC-7140 model $7100
Ratings (5 highest)	ease of use 4, expansion 3, IBM compatibility 5, documentation 4, value for money 3.

Options and warrants

by Martin Webb,
Investment Analyst, GRE New Zealand Limited

Over the last two or three years the New Zealand equities market has witnessed the introduction of two popular and different financial instruments in the forms of options and warrants.

Both these instruments are similar in nature and share many common characteristics, including the advantage of providing investors with potential leverage over a more valuable underlying security for a much reduced initial capital outlay. However, there are distinctions between options and warrants which are perhaps not generally appreciated by investors in New Zealand.

Definitions

Options

An option is an instrument which gives the holder the right, but not the obligation, to buy or sell a security at a specified price during a specified or designated period of time. There are two specific types of options:

- Call Options – give the owner the right to purchase a given number of shares at a specified price during a given time period.
- Put Options – give the holder the right to sell a given number of shares at a specified price during a given time interval.

Note should also be made of the difference between an American option, which can be exercised at any time prior to expiration date, and a European option which can only be exercised on the expiration date of the option.

Warrants

A warrant is an option to buy a stated number of shares at a specified price at the expiration or exercise date of the warrant. The major differences between a warrant and a call option are that warrants are typically issued for a longer term than call options, say two to five years against an option's typical term of between 30 days and 6 months. Secondly, and more importantly, warrants are issued by the company issuing the shares and, as a result, when the investor exercises the warrant and buys the shares, the shares are acquired from the company. The proceeds from the sale of shares are thus new equity capital for the issuing company as opposed to exercise or strike price consideration for the "options writer" as in the case of a call option.

Methods of Valuation

Options

There are five factors which affect the valuation of an American call option. These are:

- The share price of the underlying security (or head share).
- The exercise price of the option.
- The remaining term to maturity of the option.
- The risk free or prime corporate interest rate applicable to the remaining term of the option.
- The volatility of the underlying share (normally measured as the standard deviation of the annual rate of return on the underlying security).

A detailed analysis of the methodology employed in valuing call options is obviously beyond the scope of this discussion, but readers are referred to pages 728-731 of the book *Investment Analysis and Portfolio Management,* by Frank K Reilly, 2nd Edition, Dryden Press, for a detailed discussion of the workings of the recognised method of valuing such securities through the use of the Black & Scholes options pricing model (as modified by Merton).

Warrants

The valuation of a warrant is achieved in a similar manner to that of an option. Essentially what the investor is endeavouring to do is to establish the intrinsic or alternatively speculative value of the warrant.

This will ultimately be a function of the following formula:

Intrinsic Value = (Market Price of Underlying Security – Warrant Exercise Price)

e.g. Assume XYZ Ltd has issued warrants to purchase ordinary shares on 31:03:1990 at 500c per share. Further, assume that these warrants are currently trading at 80c per warrant and that the current price of XYZ Ltd shares (the underlying security) is 710c. The implied intrinsic value (iv) of the warrants would therefore be 210c, calculated as follows.

iv = (Market Price of underlying Security 710c – Warrant Exercise Price 500) = 210c

It would thus appear that the warrants are trading at approximately 130c below their theoretical value and that a profit maximising investor would conclude that investment in the warrants at current price levels appears an attractive opportunity. Of course the investor would also have to take ito consideration the term to run until he can exercise the warrant and the likelihood of the share price of the underlying security remaining at or above current levels, up to the exercise and beyond the exercise date of his warrant.

Summary

Through the use of options and warrants, an investor is able to gain significant leverage or "gearing" advantages as opposed to actually maintaining a full physical position in the underlying security. From the above example it can be seen that for an initial outlay of 80c the investor gains exposure to a 710c investment without having to outlay the residual 630c which can be reinvested, hopefully more profitably in an alternative investment avenue (e.g. Government Stock yielding say 16.5 per cent pa).

Warrants and options are thus playing an increasingly important role in portfolio management as both hedging and trading instruments as well as enabling portfolio investors the opportunity to diversify the potential population of securities making up their portfolios. With the increasing sophistication of both the New Zealand and global capital markets, further use of option and warrants (and hybrid variations of these instruments e.g. convertible bonds with warrants attached) can be expected. ■

Sources: Investment Analysis and Portfolio Management, *Frank Reilly*
Acknowledgement: Fay, Richwhite Equities Limited
Disclaimer: The views expressed in this article are those of the writer and are not necessarily those of GRE New Zealand

British Microcomputing Awards 1987

by Owen and Audrey Bishop

There were more than 100 contenders for this year's awards and the overall impression was that the standard of entries was higher than ever. This year the awards were presented at a gala dinner held in a Kensington, London, hotel. The judging and presentation was timed to coincide with the Personal Computer World show, reported last month.

The first category of award was for the **Business Micro of the Year,** sponsored by Barclays Bank Plc. Finalists were the Zenith 181 IBM PC/XT compatible, the TandonPac 286 from Tandon Computers UK, and the Compaq Portable III, with the winner being the TandonPac 286, a machine designed around portable rugged AT-compatible hard disks. It was considered to be well thought out and marketed at a very reasonable price.

The **Business Software** award, sponsored by Micro Decision, went to the Abode Illustrator from McQueen. This is an extremely innovative graphics package for the Apple Macintosh, designed for use by graphics artists, architects, cartographers and technical illustrators. Runners-up in this category were the Davrelle business graphics package from Soft Image Systems, and Ventura Publisher, a low-cost desktop publishing package developed by Xerox.

The finalists for the **Home/Small Business Micro of the Year** were Commodore's Amiga 500, the Amstrad 512 and Acorn Computers' Archimedes micro. The Archimedes scored heavily for its striking processing power of 4 MIPS (million instructions per second) arising from its innovative RISC technology, and was the clear winner.

The **Home/Small Business Software** award was won by Ability software from Migent UK. Although this package costs only £99 it has six functions: database, business graphics, word processing, communications, spreadsheet and presentation graphics. Add to that the fact that it is easy and flexible to use, and one can see why it deserved success.

Another serious contender in this section was Desktop Publisher, from Database Software, for the Amstrad PCW8256/8512 machines. It costs only £29.95, yet has three integrated editors for page layout, 15-font text capabilities and numerous other attractive features. The third finalist in this section was Compsoft's Bookworker, an accounting system with the special feature that the screen layout looks as much as possible like a conventional manual system. Both of the Home/Small Business awards were sponsored by *What Micro?* magazine.

The three finalists for the **Game of the Year** were all arcade or graphics programs. Marble Madness by Electronics Arts (US) is a race to guide a marble around mazes, encountering all kinds of hazards on the way. Defender of the Crown is a medieval adventure from Mirrorsoft, in which players have to defend England against Norman invaders and find the crown. The program includes 3-D jousting and other ferocious conflicts.

Winner in this section, sponsored by *Personal Computer World,* was Guild of Thieves from Rainbird Software. Although the scenario for the game – to ransack an island of all its treasure – does not sound out of the ordinary, the game scored heavily because its parser shows an excellent understanding of natural language. In addition, the game has lasting appeal because the flexibility of the program provides variety each time it is played.

There were three Special Awards, sponsored by *Personal Computer World.* The first was won by Concept II Research for its CAD package, Ormus Fashion, intended for use on fashion or textile design courses and bringing computer aided design into fashion colleges for the first time.

The second Special Award went to ROMBO Productions for its low-cost (£99) Vidi-PCW Video Digitiser for the Amstrad PCW computers. This is likely to be of great use in desktop publishing applications of these machines.

Desktop publishing featured in the Special Awards too (as it seems to have done in the PCW show as a whole this year). Ventura Publisher, one of the runners-up in the Business Software category, received the third Special Award because of its having established itself as a benchmark for DTP software.

Another runner-up was favoured with a Special Commendation by the judges. This was the Amstrad 1512, because of its impact on the pricing of other machines and the software to run on them. Whether or not you are an Amstrad owner yourself, you may have much to thank Alan Sugar for, even when buying a machine other than an Amstrad.

It is clear that the microcomputer scene is as lively, if not more lively, than ever. Low-cost software, more powerful yet affordable machines, and a great deal more thought in the realm of user-friendliness seem to be the keynote of this year's winners.

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3. If more than one fully correct or equally correct entry is received, they will be mixed and the winner drawn at random from them.
4. The judges' decision is final and no correspondence will be entered into.
5. All entries become the property of Bits & Bytes Ltd and will not be returned.
6. The winner will be contacted before 1 February 1988 and details of the winner and correct answers published in the February 1988 issue of *Bits & Bytes*.
7. All entries must be received on or before 15 January 1988 at:
   Bits & Bytes
   P.O. Box 9870,
   Newmarket,
   AUCKLAND

1. You've all heard of the Mouse, but when, where and how did MICKIE become part of computer history?
2. Fancy a nicely paid job? What was the highest salary paid to a computer company president/chief executive last year?
3. Who was the winner of the 1987 Personal Computer Software Award, presented at Computing 87 exhibition in Auckland?
4. When did the first issue of *BYTE* magazine appear?
5. When was the first issue of the major British computing magazine *Practical Computing*?
6. In what year was the first sale of the CP/M operating system?
7. Way back in data processing history, Charles Babbage designed the Analytical Engine, embodying many concepts similar to modern machines. What was to be the power source for this device?
8. The Altair computer was featured as cover story in what electronics magazine? Title and issue please.
9. In 1964, the Basic computer language was designed. Who are the two people credited with the design of the language?
10. When did the Apple II computer first come on to the market?
11. What was the original name of Gary Kildall's Digital Research company?
12. He was a chemical engineer born in Bangkok of British parents, and made and lost a fortune in computers in the early 1980s. Who is he?
13. When was the Zilog Z80 processor first used?
14. Which company produced the first Japanese-made microprocessor, and what was its designation?
15. What was the name of the first word processing program for microcomputer?
16. With version 3.0 of Lotus 1-2-3, what major policy change is to be implemented by the company?
17. Who were the bride and groom in the world's first on-computer wedding? (They met "on-line", were wed sharing a terminal, with a minister officiating on another a few rooms away! It could only have happened in Texas!)
18. What had to be done to reprogram ENIAC, one of the world's first computers, in its initial configuration?
19. Which high-level programming language uses symbols created by overstriking two regular characters, each of which replaces many lines of code that other languages might require?
20. 1987 saw NZ's first implementation of a desktop publishing system, using microcomputers, to cover all production stages of a newspaper. Which newspaper?
21. What is another name for a motherboard, sounding vaguely aeronautical!
22. What is said to be the origin of the computer jargon "a bug"?
23. How many people attended the Computing 87 exhibition in Auckland in May 1987?
24. What does the Acronym COMAL stand for, and where was it developed?
25. Which company was awarded the contract in 1987 to supply the NZ Parliament with an office automation and computer system?
26. The Unix operating system was developed in 1969, at Bell Laboratories. Name the two people generally credited with this achievement.
27. IBM is the biggest computer firm worldwide, but who is no 2, according to latest annual turnover figures up to Sep 87?
28. What standard plug and socket is now used by NZ Telecom for connection of data equipment?
29. In the world of the multi-user operating system, name the NZ product with tutorials and documentation written by *Bits & Bytes* columnist Mark James?
30. For which computer firm do 1987 Physics Nobel prizewinners George Bednorz and Alex Mueller work?
31. What is the designation of the CCITT designed Access Protocol used in the PACNET packet switching network?
32. What computers were used on the KZ-7 America's Cup yachting challenge, at the actual racing stage?
33. Which firm claims to be the world's largest retailer of personal computers, with 850 stores in 29 countries? It commenced operations in NZ late in 1986.
34. What is the postal address of the NZ Computer Society?
35. What was the original name of the Microsoft software company, before 1975?
36. Steve Wozniak's first computer game, a version of Pong, featured an unorthodox screen message, when the player missed the blip. What was the message?
37. When did the first West Coast Computer Faire take place?

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Communicating with the real world

Connecting PCs to things can be a complicated business, or it can be fairly straightforward, depending on the user's requirements. What is needed in the first instance is some understanding of the serial and parallel ports, those multi-pin sockets on the back of the machine. Alistair Grant George explains.

Of the thousands of IBM or lookalike machines being used in New Zealand, very few are being used to do jobs using external devices. In this article I hope to assist personnel engaged in mundane data entry, where the machinery is available to do data logging without any manual input.

IBM computers communicate via a socket on the rear, referred to as an RS232 port. Most clones (IBM compatible) which have a clock also have the RS232 as part of the same board. If you are unsure of the availability of the port, firstly check your owner's manual under RS232, serial port, I/O (input-output), or communications.

Generally, the RS232 port is a male, 25-pin D-shell. Your printer port is a 25-pin D-shell female and the video is 12-pin D-shell female.

Differences, although initially appearing complex, are simply a matter of understanding the names of pin-outs.

Note that this port is a *serial* port as opposed to your printer's *parallel* port. The main difference of the parallel port is that the data appears on eight separate lines (D0 through D7) simultaneously, whereas the same information on the serial port must flow down one line sequentially. There are quite different lines used on each type of port, but these relate to the handling of the data.

For this experiment, and to get used to wiring the various cables and learning what each control line and data line does, I recommend getting together with a friend who has a similar computer, or use a club night and organise another computer to work with your machine and communicate.

The object of this initial exercise is to get your computer under the control of a remote computer screen and keyboard.

Equipment required is: two 25-pin D-type connectors (make sure you have the relevant pins to suit); multiway cable with at least three cores, about five metres in length; and optional LED mini-tester, which will show what the lines are doing, when in operation.

Reliable interconnection

The Electronic Industry Association RS232C standard has been adopted by manufacturers, to ensure reliable interconnection between peripheral devices and or computers.

DTE (data terminal – computer) and DCE (data communications device) differences, although initially appearing complex, are simply a matter of understanding the names of pin-outs, which are identified by letters characterised by their similar name e.g. DSR – Data Set Ready. Refer to figure 2 for full details on the signal lines.

The three lines which are the minimum requirement for communicating are pins 2, 3, and 7. Pin two *transmits* data, pin three *receives* data, and pin 7 is the earth lead.

When you wire the leads into their 25-pin D-type connectors, remember that if you are wiring into dissimilar units, for example a plug and a socket, leads 2 and 3 go straight through. Otherwise, if the same, pins 2 and 3 are reversed on one of the units. Observe the difference between figures 2 and 3.

Armed with your cable and two computers, you are now ready to communicate. Turn both computers on, with all leads connected (including our new lead).

Using your DOS directory, or the one with COMMAND.COM and MODE.EXE, type the following on both computers: MODE COM1:2400, N,8,1,P then on one computer only, type CTTY COM1:.

Now, all things being equal and the wind blowing in the right direction, you will have a new DOS prompt, for example C> on the computer that you did not type CTTY COM1:. The C> computer is now using the second computer system and all screen and keyboard operations, including the running of that computer's programs, are possible from C> computer.

To exit, type CTTY CON on the C> computer. There are some anomalies

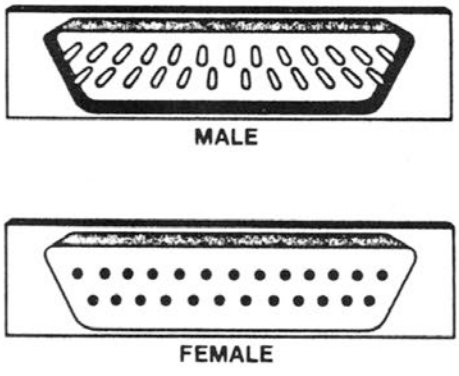


Figure 1: male and female connectors

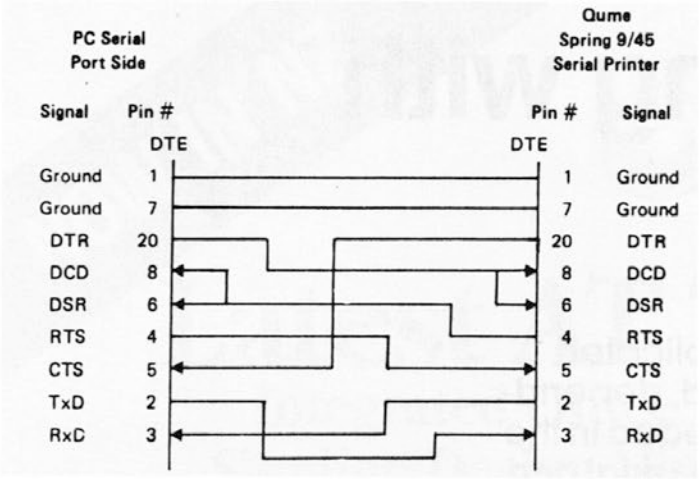


Figure 2: example of a specific DTE to DTE interface

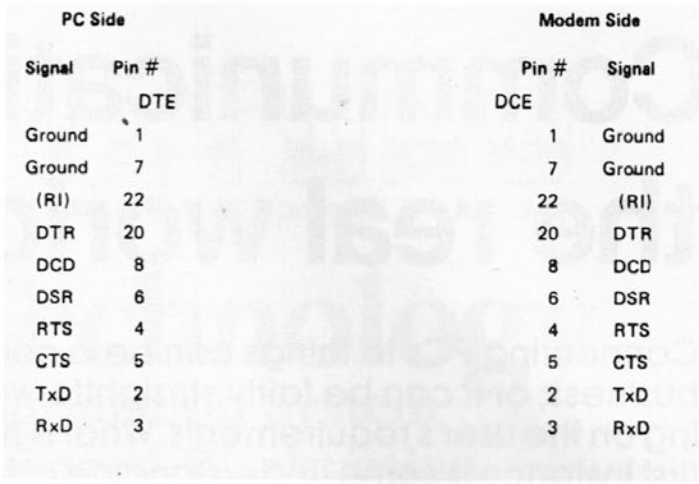


Figure 3: the ideal: terminal to modem

with DOS and this may not work. If you are unsuccessful in this operation, you will still lose control of the CTTY COM1: computer. Simply reboot, as no harm can be done.

Do not suspect your interconnections at this stage. The next step is to get a communications program, of which there is a multitude available, especially in club circles.

All these lines react positively by raising the voltage on each respective line.

I recommend these settings for this type of linkup, the settings to be done on the menu offered by the comms program...

BAUD 2400
BITS 8
STOP BITS 1
REOL ..... CR/LF
REOF ..... SUB
TEOL ..... LF
TEOF ..... SUB
DUPLEX ..... HALF
PORT COM1
PARITY/HAND/PROTOCOL/WIDTH /TIMEOUT/RTRN...NONE

Actually, most parameters are not very critical, and even if some are wrong, communications is usually OK. The main things to ensure are correct are BAUD, BITS and STOP BITS.

Another thing which will help you is to use the same comms program on both computers.

If, after trying to use a communications program, communications are still not avaialble, check that leads 7, 2 and 3 are correct as previously described. The numbering system on computer plugs is difficult to read – check those connections.

Some connectors have stand-off screws to secure them. The stand-offs can cause the connection to be faulty, if not properly used. Make sure that you are using the correct computer port, as there are several available on the rear of your computer.

Wiring a standard lead

So that you can understand the signal and system of the RS232 standard, I will describe a connection between the serial port on the I/O plus board (DTE) and a telephone modem (DCE), or in layman's terms, plug and socket arrangement.

A properly configured DCE/DTE interface will be wired straight through – pin #1 to pin #1, pin #20 to pin #20 and so on. Computers properly wired interrogate each other to ensure correct transfer of information between each device. This is called 'handshaking'.

When the RS232 DTE port on your PC wants to send information, it raises the voltage on pin #20 – Data Terminal Ready – and is effectively saying, "I want to send something." The DCE tells itself that there is a communications requirement, and because it is a modem, it then checks to see if there is an open phone line. If this exists, the modem responds by raising Data Set Ready and Data Carrier Detect ("Yes it's OK to send").

When the PC receives this go signal, it is free to bring up a final query line, Request to Send ("I want to send now"). The DCE confirm is Clear to Send and the DTE can then send on Transmit Data.

All these lines referred to respond positively by raising the voltage on each respective line. It is interesting to see this occurring by using a minitester and watching the light emitting diodes working in sympathy, from green "not ready" to red "ready".

A detailed discussion on the interconnection of IBM type equipment and external devices is beyond the scope of this article, but by applying the prior information to job requirements, control of almost any electronic equipment is possible. Recently, I had to connect a set of highly accurate electronic scales to a PC, in order to remove operator errors and reduce workloads.

The correct wiring of the cable and additional control circuitry in the scales has allowed satisfactory control of the DCE device. The result is that the scales send only when requested by the computer. Received data is calculated and processed onscreen, then sent off to a database (and later a spreadsheet) for further recording and processing.

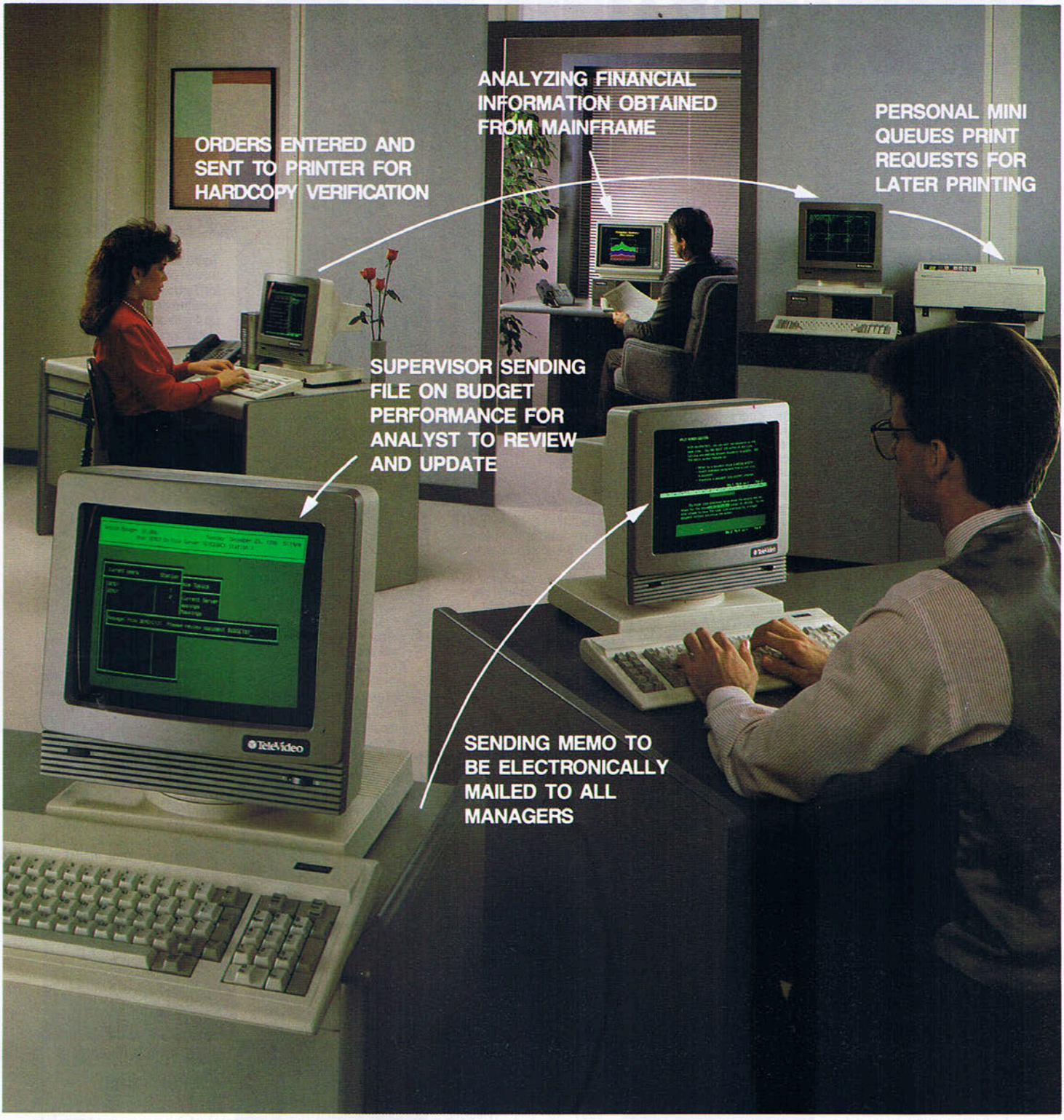


Figure 4: hand-held microcomputer connected to a PC

Illustrated in figure 4 is a hand-held microcomputer. I find this unit invaluable for communications setup work and protocol testing. Because of its flexibility, it can be configured to task as the actual test device for the application being investigated.

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Long-term marriage – or divorce?

by Adrian Adcock *Manager, Tech Pacific*

compatible *adj.* 1. able to exist together harmoniously. 4. (of pieces of machinery, computer equipment, etc.) capable of being used together without special modification or adaptation. (*Collins English Dictionary*)

In terms of Personal Computers (and personal relationships with computers) compatibility means: can you field the interrupt without blowing your stack? I can hardly believe the number of things a sales person must remember to effectively put a package together.

I remember when I was working in the role of technocrat with a government department and read about the new Intel Inboard 386, which was advertised as being able to upgrade an IBM AT or compatible machine into a 16MHz screamer, only to find that this particular computer had the motherboard upside down and the cable wouldn't reach the 286 processor socket!

So what is compatible? There seem to be three main areas in the compatible arena. Will it run the software, will it take the hardware and does it go when the hardware is plugged in?

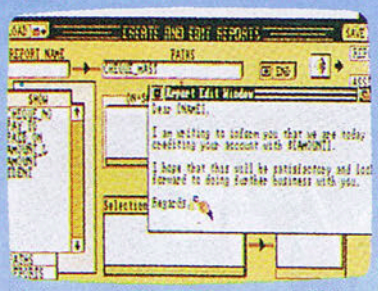
Software compatibility is probably the easiest to claim. I'm sure that with a good programming package,

When the work is done it's a whole lot of fun!

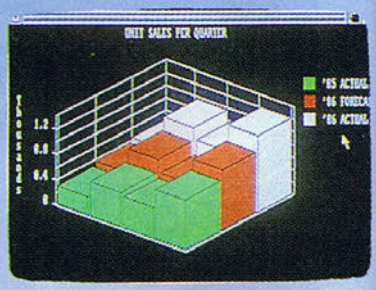
The Amiga 500 from Commodore is a new concept in home computing. It will do everything you'd expect of a 512 K computer — and a lot more — at a price that won't break your bank and in ways that make computing easy.



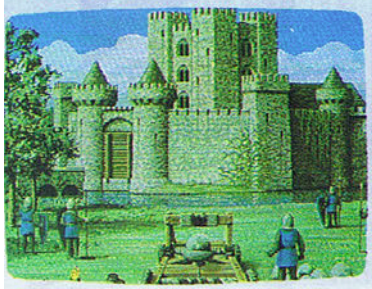
* The Amiga 500 makes music brilliantly. It's built-in synthesiser will produce almost every musical instrument. You can write a melody or a symphony. The Amiga will digitally store the music on its 3½" disc drive and play it back in stereo.



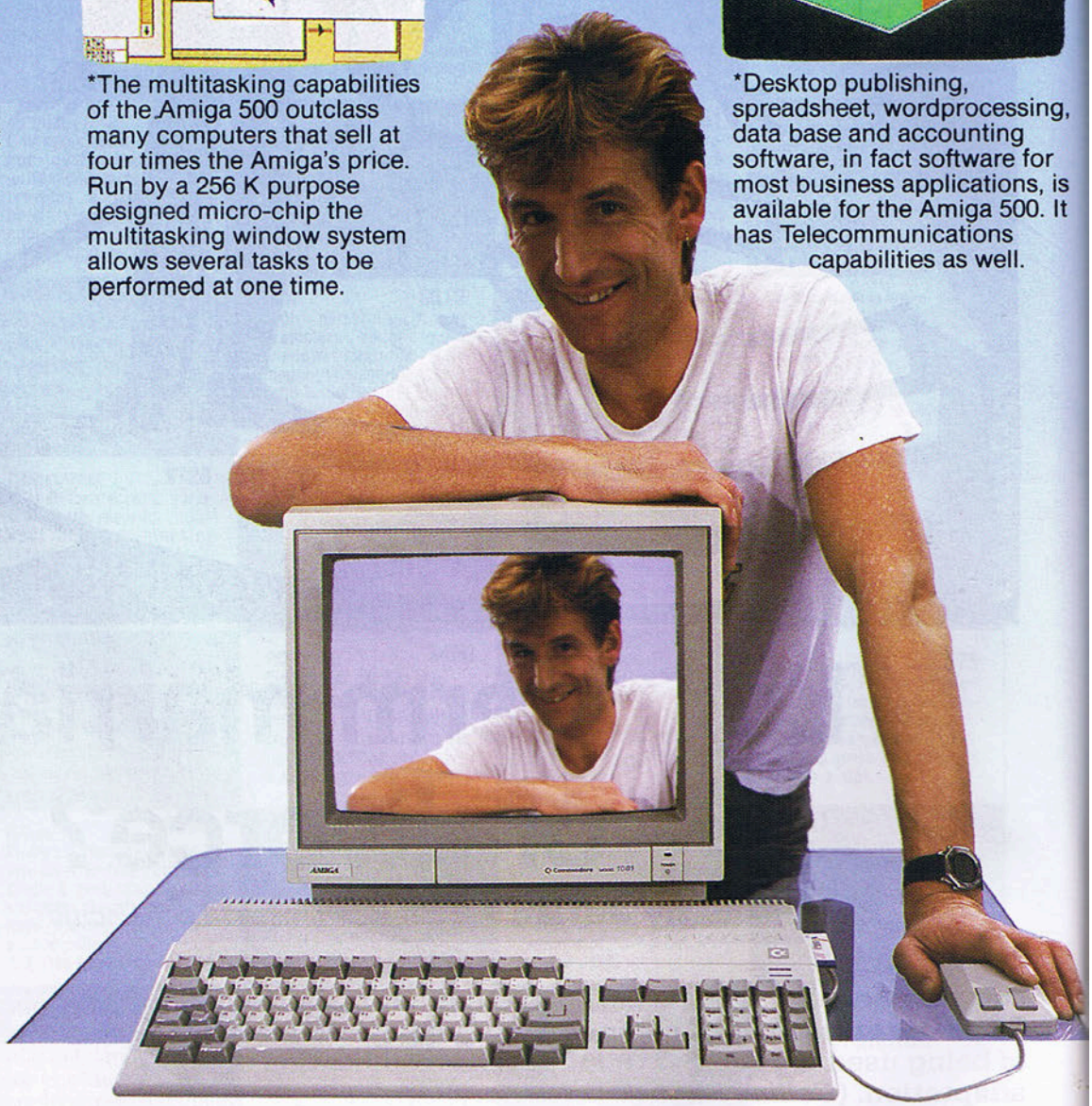
*The multitasking capabilities of the Amiga 500 outclass many computers that sell at four times the Amiga's price. Run by a 256 K purpose designed micro-chip the multitasking window system allows several tasks to be performed at one time.



*Desktop publishing, spreadsheet, wordprocessing, data base and accounting software, in fact software for most business applications, is available for the Amiga 500. It has Telecommunications capabilities as well.



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Taranaki
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Wellington
Computer Experience, Wellington 736-777 — Computer Village, Upper Hutt 278-595 — Computer Village, Lower Hutt 693-313 — Computer Village, Bowen St 737-430 — Kapiti Business Machines, Paraparaumu 88-277 — Logitech Solutions, Wellington 724-950 — Teleart Electronics, Tawa 731-965

Northern South Island
Computer Nelson, Nelson 89-100 — Craw Video, Nelson 82-949 — Haywrights, Motueka 87-200 — Microcomputer Centre, Blenheim 81-162 — The Electronic Shop, Blenheim 89-274

West Coast
Coast Business Machines, Greymouth 5264 — Graham Electronics, Hokitika 384 — J H Greenwood, Westport 7349

Southern South Island
Commodore and Computers, Christchurch 61-399 — Computer Centre, Christchurch 793-428 — Computer Village, Christchurch 65-072 — Computer Village, Dunedin 741-506 — Eclipse Radio and Computer, Dunedin 778-102 — Ken France Electronics, Alexandra 8021 — Midland Computers, Timaru 44-241 — Smith & Church Electrical, Ashburton, 89-019 — Waitaki Electric Power Board, Oamaru 48-000 — Southern Micrographics, Invercargill 84-057



any machine can run the machine code of another. A good case is the package available in the US that enables IBM programs to run on the Atari ST – a totally different type of processor, but it can do it. Is this a compatible machine?

Or the case of the new PS/2 machines which you cannot plug any of your old gear into except the math coprocessor! Even the screens are not compatible. And finally, the case of the hard disk on a card which, when plugged in, the computer refused to boot up at all.

The number of users I eventually get to speak to about their problems with hardware compatibility is astounding. The most incredible thing is that I believe that some of these hardware manufacturers do it deliberately! "Let's develop our own BIOS at zilch cost and see how they get on trying to get the second disk interface card working." Or "Let's not put any 8-bit slots on our AT clone." Great idea, til you get something that can't fit into a 16-bit slot because it was never designed for one.

Or the case of the new PS/2 machines which you cannot plug any of your old gear into except the math coprocessor!

I could carry on all day bleating about this and that, but the crunch comes when you want to add hardware to your machine and it won't fit. Whose machine was it designed to fit anyway?

Let's take a run through some of the machines and look at potential problem areas. I must make a note here that these results are what I have personally experienced, and the rasons for problems are in some cases an educated guess.

Amstrad PC (colour) – the power supply in the colour monitor seems to interfere with some cards.
NCR PC 4 – I have had problems with disk controller cards, and the machine does not appear to be fully IBM compatible.
NEC APC 3 & 4 – the 3 again does not seem to be fully compatible and the 4 had a BIOS problem. NEC was taking action on this.
NEC Powermate – 1 & 2 also had the BIOS problem and new BIOS release was made available. Some reports from both New Zealand and Australia suggest that either power supply or cooling problems have been experienced.
Tandy 1000 – does not seem to be fully compatible.
Wang PC – not fully IBM compatible.
Epson Equity 1 – seems OK on 4.7 MHz but some cards lock the system up at 7.16 MHz. Get ROM BIOS revision 2.20 or later.
HP Vectra – the disk controller card clashes with others.
Texas IT PC – not fully IBM compatible.
AT&T 6300 Plus – needs the latest ROM PAL and it's a good idea to put in an 80287 co-pro.
Tandy 2000 – the slots are not IBM Compatible.
Zenith 158 – I had problems using above board memory with only 60 per cent of the boards working. Don't know why.
ITT Xtra XP – STC in Sydney was looking at a problem in the BIOS area with regards to some of the hooks that feed their special features. These hooks can create compatibility problems.
Olivetti M24 – I had difficulty getting EGA cards to work in these machines; not fully hardware compatible.
Olivetti M28 – because the processor is mounted on the bottom of the motherboard some products won't fit this machine.

I am not advocating that you don't buy any of these machines, but I will say that the expansion boards tried in these machine all work without any problems whatsoever in an IBM PC or AT!

My criteria for an IBM compatible machine are that you can run any software developed for IBM PCs; the hardware gives the same options as an IBM (i.e. an AT has both 8- and 16-bit slots, not 16 only); and the motherboard layout is reasonably similar to that of an IBM. It has a licensed BIOS and the power supply *off the bus* can meet the same demands as the IBM. Just be aware that when shopping, compromises must be made.

Happy Hacking, and don't hesitate to tell me about any other incompatibility problems you may come across. I'm keeping a "Snark" file on them.

Beware of the pitfalls



It's easy to get starry-eyed when first considering buying a computer. MicroLab, Coopers and Lybrand's micro consultancy service, offers some advice.

Are you a potential first-time microcomputer buyer? You may have recently started out in business or perhaps are already established and are considering computerising your accounting and related records.

Before you go any further, have you sat down and asked yourself a few sobering questions? Such as, do you really need a computer when, perhaps, your manual systems are running smoothly? If your business has inadequate manual systems and controls, don't expect a computer to be a magic panacea.

As consultants, we would like to offer a few words of objective advice together with some guidelines.

Eye-catching advertisements appear in the media from time to time exhorting the layperson to buy "a total solution" for under $3000. Sounds great, doesn't it? Before you know it you're under the spell of some hard-sell supplier who is more concerned about selling his hardware than meeting your total needs.

That's not to paint all suppliers with the same brush, and to the industry's credit there is a core of ethical and honest operators. It is also more than likely that this latter group will still be in the business of selling computers when their less scrupulous competitors (we hesitate to use the word colleagues) will have moved on to greener pastures. Remember that the computer industry is notorious for its fly-by-night operators and business failures!

Golden rule

A golden rule that many prospective computer buyers continue to overlook is that of evaluating and selecting the software before buying the hardware. This point must be emphasised, as the cheaper "total solution" places very little emphasis on the appropriateness and quality of the bundled software that is invariably included in the deal – sometimes almost as an afterthought. Packaged software programs have different features, strengths and weaknesses, and they should always be evaluated with respect to the individual user's unique requirements. No one package suits all businesses, irrespective of their size, as is implied in certain of these advertisements.

A good test is to investigate whether or not the bundled software is available separately for sale. If so, establish contact with existing users for reference purposes. Also ensure that this type of software is suitable for New Zealand conditions and, especially, that it caters for GST.

We never fail to be amazed at the attitude of some first-time buyers when it comes to trying to save money. For many people, logic escapes them and they seem determined to buy the cheapest solution. Yet they are prepared to process valuable financial information and rely on perhaps an inadequate system for the future success of their business. Don't forget that you *get what you pay for* and this is particularly true of microcomputers.

For most business applications, a dual floppy disk system is inadequate, because of disk storage limitations, inefficiencies of using numerous disks and the high risk of damaging these disks. Spend a few more hundred dollars and insist on a hard disk with at least 10Mb of storage capacity – a cheap investment, and you'll soon appreciate the benefits. While talking about disk drives, be aware that both 5.25-inch and 3.5-inch disk drives are available and you'll need to consider which is more appropriate. For the forseeable future, given the vast number of 5.25 disks that are in circulation, that size drive should suffice.

One further point that needs to be made concerns the cost of floppy disks. We can relate many horror stories where businesses have used cheap, inferior-quality disks with which to back up their records. Upon completion of this procedure it is reasonable to assume that the backup has been completed satisfactorily. Does anyone, in fact, conduct a check? We can quote cases where subsequent restore procedures have revealed corrupt backup files, not amusing when you're trying to complete a payroll run.

A recent article in *Computer World* referred to a local PC clone importer who has rejected Taiwan's quality control and has dropped Taiwanese products from its range. The article goes on to say that a 30-40 per cent failure rate is not unusual for computer products from that country, and the importer says that the products were so bad that he no longer wants to be connected with anything from that country.

So don't say that you weren't warned. Let the buyer beware! Recognise that you may be endangering the future of your business. That is no idle statement – consider what would happen to your cash flow if your debtors records were unable to be accessed.

Software support

Most software programs require some support, however minimal, in areas such as installation and training. The availability of competent support services is crucial prior to selecting any program. Will software support be available when you perhaps need it most?

In addition, does the program developer have an ongoing upgrade service as an indication of commitment to the product?

Industry standard?

Ensure that your microcomputer uses the industry standard operating system, i.e. MS-DOS, as this will enable you to select from a huge range of compatible programs. As MS-DOS will continue to be the industry standard for the foreseeable future it is the logical path to follow unless a user's specific requirements can't be satisfied with an MS-DOS program.

Hidden costs

Don't forget the cost of a reasonable all-purpose printer, power protection equipment, appropriate furniture, stationery, cabling and floppy disks. In addition, remember to increase your insurance cover.

Other costs that may be more difficult to quantify include installation, training and support. Remember that it can take anywhere from six months to a year (and in some cases longer) for the new user to go through the computer learning curve and for the system to settle down in the user's particular environment. It would be prudent to run your existing manual system parallel with the new computer system for a few months until you are satisfied with the results.

What are the terms and conditions of the hardeware guarantee? Is the supplier prepared to offer a hardware maintenance contract and will such inevitable maintenance be conducted at your premises or will you have to send the equipment to the supplier?

The intention of this article is not to discourage you from buying a computer system, but it is intended to make the prospective buyer aware of some of the many pitfalls to be avoided. Consider seeking the advice of an independent consultant who will normally be able to assist you with installation, training and support. ■

TELEVIDEO 965



Keyboard: ASCII PC/AT enhanced
Video: choice of green or paper white display
Resolution: 10 x 16 character cell – 49 x 132 lines by columns
Other components: 23 terminal emulations, 3 keyboard options
Price: $1160.00
Features: 23 terminal emulations, 3 keyboard options, interactive on screen calculator, calendar alarm clock
Agent: IMPACT Technologies Ltd

TELEVIDEO 905

Keyboard: 2 position, detached, slim line, typewriter style
Video: 14 inch, green, super dark high res
Resolution: 24 x 80
Price: $1180.00
Features: 12 terminal emulations, true accounting terminal and keyboard
Agent: IMPACT Technologies Ltd

TELEVIDEO's PC Station

Keyboard: IBM AT style
Video: green, tilt and swivel 14 inch diagonal
Interfaces: RS232C main/IBM host port
Price: $1560
Agents: Impact Technologies Ltd

SHARP PC-7000



Processor: 8086
RAM: 384Kb expandable to 768kb
Keyboard: 84 keys
Operating System: MS-DOS 2.11
Agents: Pegasus Systems Ltd

Readers should be aware that prices could change after publication.

MULTITECH ACER 500+

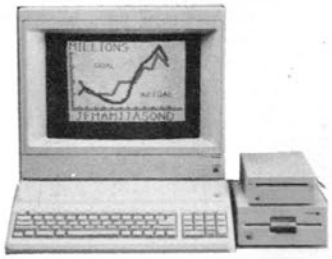
Processor: V20 (8088-2 compatible) 4.77/8MHz
RAM: 256k-640k
Video RAM: Hercules
Keyboard: 84 key
Video: Hercules compatible,
Resolution: 80 x 25 characters, 720 x 348 pixels
Interfaces: RS232 serial, centronics parallel
Disk drives: 1 or 2 x 360 k 5¼" floppy drives also 20 mb version
Operating System: MS-DOS (3.2)
Languages: fully IBM PC compatible
Bundled software: optional
Price: single drive 256k $1295 twin drive 256k $1495 20mb hard disk 640k $2495
Features: turbo speed with 8mhz V20
Agents: Dick Smith Electronics

MULTITECH ACER 710



Processor: 8088 4.77/10MHz
RAM: 640kb expandable
Keyboard: 84 key
Video: four in one display (GA colour, MDA, MGA Hercules and Plantronics colourplus)
Resolution: 720 x 348 pixels
Interfaces: RS232 serial and centronics parallel
Disk drives: 2 x 360k 5¼" floppies or 20Mb hard disk
Operating System: MS DOS 3.2 (supplied)
Languages: fully IBM PC compatible
Bundled software: optional
Price: twin disk 640k $1795/ 20Mb $2995/monitor additional
Expansions: real time clock, socket for 8087 co-processor
Features: 4.77/10 Mhz
Agents: Dick Smith Electronics

APPLE IIe



Processor: 65C02
RAM: 128k
Keyboard: typewriter type with 63 keys
Video: 40/80 column text 5 x 7
Resolution: low resolution – 16 colours 40H x 48V, high res. 6 colours 280H x 192V
Interfaces: printer, disk drive
Disk drives: 140k, 800k
Operating System: Apple Prodos, DOS, CP/M, Pascal, MS-DOS
Languages: wide range
Price: $1195
Expansions: wide range of Apple branded and 3rd party extras
Features: 16k ROM inc Applesoft, Basic, 7 1/0 expansion slots, speaker, hand control inputs/outputs, cassette input/output
Agents: CED Distributors Ltd

TATUNG TCS3000 XT

RAM: 640 k
Operating System: MS DOS 3.2
Price: $2950 plus GST
Agents: Profcom Systems Ltd

BBC MASTER COMPACT



Processor: 65C12
RAM: 128k
Video RAM: 20k
Keyboard: Qwerty with numeric pad and function keys
Video: TTL RGB, mono composite video
Resolution: 640 x 256 8 colours
Interfaces: parallel printer,
Disk drives: 640k 3.5"
Operating System: BBC MOS
Languages: logo, BBC basic, C, forth, pascal, lisp
Bundled software: Logo, wordprocessors, Editor, Utilities
Price: $1690 plus GST
Expansions: RS232 port and network
Agents: Barson Computers NZ Ltd

BBC MASTER 128

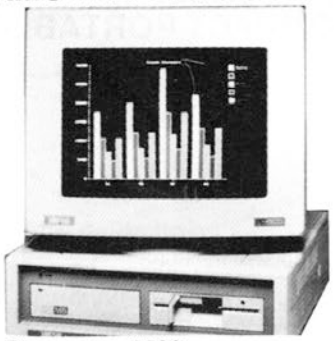


Processor: 65C12
RAM: 128k
Video RAM: 20k
Keyboard: Qwerty, numeric pad, function keys
Video: TTL RGB,
Resolution: 640 x 256 8 colours
Interfaces: analogue, user port, parallel, serial, cassette, option econetlan
Disk drives: optional 400k 5¼, 640k 5¼
Operating System: BBC MOS, MS DOS
Languages: BBC basic, C, Pascal,
Bundled software: Basic, Word Processor, Spreadsheet, Editor, Terminal, Utilities
Price: $1810 plus GST
Expansions: internal second processors
Agents: Barson Computers NZ Ltd

MITAC PARAGON 88 COMPACT

Processor: 8088-2
RAM: 768k RAM (640k plus 128k RAMdisk)
Video RAM: 64k
Keyboard: 101 PS/2 style, separate cursor and numeric keypads, 12 function keys
Video: on-board four-in-one display adapter. Emulates Hercules Mono, CGA, MDA and Plantronics.
Resolution: Hercules mode 720H x 350V. CGA mode 640H x 200V.
Interfaces: parallel centronics port, RS-232 Serial Port.
Disk drives: 1 x 3.5" 720 k disk drive
Operating System: MS-DOS, PC-DOS, Concurrent DOS, Microsoft Windows, GEM, DESQview.
Languages: GW-basic, Quick Basic, Quick C,. Turbo Basic, Turbo Pascal, Turbo C, Prolog.
Bundled software: MS-DOS 3.2, First Choice version Two
Price: $2995 incl GST
Expansions: five full length expansion slots.
Agents: Pacific Computers Ltd

AMSTRAD PC1640



Processor: 8086
RAM: 640k
Video RAM: 256k
Keyboard: PCXT
Video: mono adaptor, (GA, EGA, Hercules)
Resolution: 720 x 348
Interfaces: serial parallel, mouse, games port
Disk drives: single, double or 20 meg hard disc
Other components: monitor, mouse
Operating System: MS-DOS 3.2
Languages: BASIC
Bundled software: GEM operating system
Price: From $1992
Expansions: 4 full lkength slots
Features: hi-res monitor, battery backed clock calendar, mouse, light pen
Agents: Amstrad Computers

AMSTRAD PCW9512



Processor: Z80A
RAM: 512k
Keyboard: PC style
Resolution: 720 x 256
Interfaces: centronics port
Disk drives: 1 x 1 meg
Other components: 15" daisywheel printer
Operating System: CP/M plus
Languages: basic, logo
Bundled software: Logoscript v2 word processing, LocoMail and LocoSpell
Price: $2100 plus GST
Expansions: extra 1 meg drive
Agents: Amstrad Computers

PSION ORGANISER II MODEL CM, XP



Processor:	HITACHI HD6303X
RAM:	8k RAM (CM), 32k RAM (XP)
Keyboard:	36 keys inc
Video:	LCD display
Resolution:	16 x 2 character
Interfaces:	RS232C, comms link (optional)
Disk drives:	2 solid state Eprom 'Datapak' drives
Other components:	barcode, magnetic card (XP only)
Operating System:	organiser
Languages:	OPL structured, enhanced basic
Bundled software:	(optional)
Price:	CM $299 plus GST, XP $569 plus GST
Expansions:	expandable data storage using plug-in Eprom datapaks
Features:	built-in database software, diary alarms
Agents:	Leatham Electronics Limited

TATUNG TCS3000 PC2

RAM:	640k
Operating System:	MS DOS 3.2
Price:	$1950 plus GST
Agents:	Profcom systems Ltd

PULSAR 88

Processor:	4.77/10 MHz
RAM:	640kb
Video RAM:	64 kb's of display memory
Keyboard:	101 key keyboard with separate numeric and cursor pads
Video:	12" monochrome monitor – amb er display – tolt and swivel stand
Resolution:	720 x 348
Interfaces:	2 parallel 1 serial with 2nd serial optional
Disk drives:	1 x 360kb floppy disk drive 1 x 20mb hard disk drive
Other components:	real time clock, games port, floppy and hard disk controllers
Operating System:	MS DOS
Languages:	Basic, Pascal, C, Cobol, Fortran
Price:	$
Expansions:	8 shots 5 free
Features:	small foot print – turbo and reset switches on front of cabinet
Agents:	NCS Computers

DATABGOLD XT TURBO



Processor:	NEC V40 cpu
RAM:	640kb
Video RAM:	64k
Keyboard:	101 extended
Video:	both CGA and Hercules compatible
Resolution:	270 x 348 in mono,
Interfaces:	serial / parallel ports
Disk drives:	20 megabyte hard drive and 360k floppy
Other components:	clock/calendar
Operating System:	MS DOS 3.2
Languages:	G W Basic
Bundled software:	MS DOS 3.2 plus G W Basic 3.2
Price:	$2995
Expansions:	4 expansion slots
Agents:	MoS Computers, Software and Supplies

LASER XT COMPACT PORTABLE



Processor:	8088
RAM:	256 k
Video RAM:	256k
Keyboard:	90 keys
Video:	CGA and HGC
Resolution:	CGA 16 colour 640 x 200 HGC 720 x 348
Interfaces:	in-built parallel and serial printer, joystick, CGA, external disc drive, speaker and expansion slot
Disk drives:	5.25" inbuilt with additional 5.25" or 3.5" drives
Operating System:	MS DOS
Bundled software:	DOS 3.1
Price:	$1595 plus GST
Expansions:	expandable to 640k hard disc drive card and expansion box for additional cards, LCD screen
Features:	small footprint
Agents:	Floppy Disc Express Co Ltd

LASER XTE COMPACT PORTABLE COMPACT



Processor:	8088
RAM:	640k
Video RAM:	256k
Keyboard:	90 keys
Video:	enhanced graphics adapter (EGA) color graphics adapter (CGA) Hercules graphic card (HGC)
Resolution:	EGA: 16 colours 640 x 350. HGC: 720 x 348
Interfaces:	inbuilt parallel and serial printer modem,
Disk drives:	5.25" inbuilt with additional 5.25" or 3.5" drives
Other components:	clock calendar
Operating System:	MS-DOS
Bundled software:	DOS 3.1
Price:	$1995 plus GST
Expansions:	hard disk drive card, expansion box for additional cards, LCD SCREEN
Agents:	Floppy Disc Express Co Ltd

BUDGET PRICED SOFTWARE

Entertainment



Dragonworld ™:
You are Amsel of Fandora, scientist, researcher, and something of a visionary. The Last Dragon has been kidnapped and only you can save him.

Apple II+, IIe, IIc	**$39.95**
Commodore 64/128	**$39.95**
IBM PC/AT or Tandy 1000	**$39.95**



Fahrenheit 451 ™:
In this adventure, based on the novel by Ray Bradbury, you must lead the rebel Underground against the Firemen and their deadly campaign to burn the books of the world.

Apple II+, IIe, IIc	**$39.95**
Commodore 64/128	**$39.95**
IBM PC/AT or Tandy 1000	**$39.95**



Wizard of OZ ™:
As Dorothy, you and your dog Toto make your way to the Emerald City and meet many unusual and wonderful characters like the Munchkins and Scarecrow.

Apple II+, IIe, IIc	**$39.95**
Commodore 64/128	**$29.95**
IBM PC/AT or Tandy 1000	**$39.95**



Nine Princes in Amber ™:
In a game of negotiation, politics and alliances, you are Corwin, a prince fighting for the throne of the one true perfect world – Amber.

Apple II+, IIe, IIc	**$39.95**
Commodore 64/128	**$39.95**
IBM PC/AT or Tandy 1000	**$39.95**



Rendezvous with Rama ™:
The year is 2130 as the spaceship RAMA steadily advances towards Earth. Your mission as Commander is to make contact with Rama and explore it before it completes its orbit in the solar system.

Apple II+, IIe, IIc	**$39.95**
Commodore 64/128	**$39.95**
IBM PC/AT or Tandy 1000	**$39.95**



Word Challenge ™:
Test and improve your vocabulary by playing this sophisticated word game against Lex, an opponent of uncanny skill and intelligence.

Apple/IBM flippy	**$29.95**
Commodore 64/128	**$29.95**



Treasure Island ™:
As Jim Hawkins, search for pirate gold and for a way to outwit Long John Silver, a clever and cunning buccaneer.

Apple II+, IIe, IIc	**$39.95**
Commodore 64/128	**$29.95**
IBM PC/AT or Tandy 1000	**$39.95**



Sargon II ™:
Play chess as you've never played it before, against the acknowledged computer chess champion. Sargon II plays you at your level from beginner through Grand Master – seven levels in all.

Apple IIe, IIc	**$29.95**
Atari/Commodore flippy	**$29.95**

Business



Easy Working: The Writer ™:
Complete word processing features allow you to create your letters and reports and arrange them to suit your needs. Editing functions include insert, delete, cut, paste, and copy. Easy Working: The Writer, Planner and Filer are each fully integratable.

Apple II+, IIe, IIc	**$29.95**
Commodore 64/128	**$29.95**
IBM PC/AT	**$29.95**



Easy Working: The Filer ™:
A multi-purpose program which simplifies the storage, selection, and reporting of information. Maintain or create mailing lists, inventories, club memberships, and other types of information.

Apple II+, IIe, IIc	**$29.95**
Commodore 64/128	**$29.95**
IBM PC/AT	**$29.95**



Easy Working: The Planner ™:
The Planner provides you with all of the professional features of an electronic spreadsheet. Extensive mathematical operations easily create your spreadsheet for budgeting, tax calculation, expense reports, financial statements, and other applications.

Apple II+, IIe, IIc	**$29.95**
Commodore 64/128	**$29.95**
IBM PC/AT	**$29.95**

Dealer Inquiries:
09-535-4010

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California MICRO

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Howick,
Auckland.

Education



Alphabuild ™:
A graphics game that helps develop elementary skills with the alphabet. Skills covered include matching of upper- and lower-case letters, learning alphabetical order, and recognizing simple words.

Apple/IBM flippy	**$29.95**
Commodore 64/128*	**$24.95**



Up & Add'Em ™:
Animated color graphics introduce numbers and simple addition, teaching you to recognize numbers and quantities they represent. Four levels of difficulty are included.

Apple/IBM flippy*	**$29.95**
Commodore 64/128*	**$24.95**



Sea Speller ™:
Put letter combinations together to spell as many three, four, and five letter words as possible and get to the surface before the air in your submarine runs out.

Apple/IBM flippy	**$29.95**
Commodore 64/128*	**$24.95**



Fraction Fever ™:
Fraction Fever combines the features of a fast-paced arcade game with the educational value of a learning game. Hop along on your pogo stick and search for the picture-fraction that matches the fraction at the top of the screen.

Apple/IBM flippy	**$29.95**
Commodore 64/128*	**$24.95**



Grandma's House ™:
Over the river and through the woods to Grandma's House you go. Choose the characters that will make the trip and off you go to explore special places and pick up things for Grandma.

Apple II+, IIe, IIc*	**$29.95**
Commodore 64/128*	**$24.95**



Logic Levels ™:
In this exciting maze game, you tell the Magic Hand where to set the walls, bridges and springs to guide the ball through the maze. But once the ball starts rolling, everything can change.

Apple II+, IIe, IIc*	**$29.95**
Commodore 64/128*	**$24.95**



Movie Creator ™:
You are in complete charge of writing and producing your own animated film. You have the power to make the stories of your imagination spring to life on the screen.

Commodore 64/128	**$24.95**



Number Tumblers ™:
Number Tumblers is a fast-paced math game that will challenge you while learning addition, subtraction, multiplication, and division. Help the lively little "Wumblechum" jump from one number tumbler to another matching the target number.

Commodore 64/128	**$24.95**

LASER 128 PORTABLE



Processor:	65C02
RAM:	128k expandable to 640k
Keyboard:	90 keys
Video:	16 colour RGB or mono
Resolution:	mono 560 x 384 or RGB 140 x 384
Interfaces:	inbuilt parallel and serial printer ports,
Disk drives:	5.25" internal, with second drive port
Operating System:	Apple compatible
Language:	Basic, Prodos, Pascal
Price:	$1150 plus GST
Expansions:	512k expansion card, additional drive, expansion box for additional I/F cards, LCD screen
Agents:	Floppy Disc Express Co Ltd

LASER 128EX PORTABLE

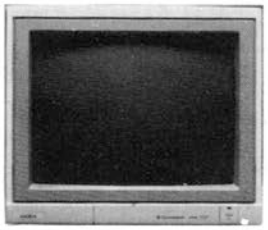
Processor:	65C02
RAM:	128k expandable to 1 meg
Video RAM:	64k
Keyboard:	90 keys with 10 function keys and numeric keypad, qwerty and dvorak
Video:	16 colour RGB or mono
Resolution:	560 x 192 16 colours
Interfaces:	inbuilt parallel and serial printer ports, modem, mouse, joystick, RGB, external drive, speaker and expansion port
Disk drives:	5.25" inbuilt with 5.25" or 3.5" addition drive
Other components:	clock calendar
Operating System:	Apple compatible
Languages:	Basic, Pascal, Produs
Price:	$1575 plus GST
Expansions:	1 meg, RAM additional drive, tv I/F adapter LCD screen, expansion box for additional I/F card
Features:	small footprint (14¾" x 12") weight 4¼kgs
Agents:	Floppy Disc Express Co Ltd

NEC PC8401



Processor:	UPD7008C (CMOS Z80)
RAM:	64k CMOS
Video RAM:	10k CMOS
Keyboard:	68 jeys (59 qwerty layout, 5 function, 4 cursor)
Video:	80 x 16 lines (CRT optional)
Resolution:	480 x 128 dots
Interfaces:	RS232C – 25 pin, centronics parallel, 8 bit cassette int
Other components:	CRT display unit – optional
Operating System:	CP/M Rom Based
software:	Wordstar, Calcstar, Filer, Telecom (ROM based)
Price:	$1115 ex GST
Expansions:	RAM cartridges,
Features:	battery or AC power,
Agents:	NEC Information System

AMIGA 500



Processor:	68000 16/32 bit
RAM:	512k expandable
Video RAM:	512k, 4096 colour pallette
Keyboard:	96 keys
Video:	
Resolution:	320 x 256, 640 x 256, 320 x 512, 640 x 512 pixels
Interfaces:	2 x reconfigurable controller ports,
Disk drives:	built in 3.5" floppy. 880 k formatted, optional 2nd drive
Other components:	mouse controller
Operating System:	Amiga DOS, Intuition
Languages:	Amiga Basic, C
Bundled software:	Amiga Basic/extras, Work bench 1.2
Price:	$1495.00, $2395 with RGB colour monitor
Expansions:	Ram/Clock calendar card for full1 m of Ram
Agents:	Commodore Computer Ltd

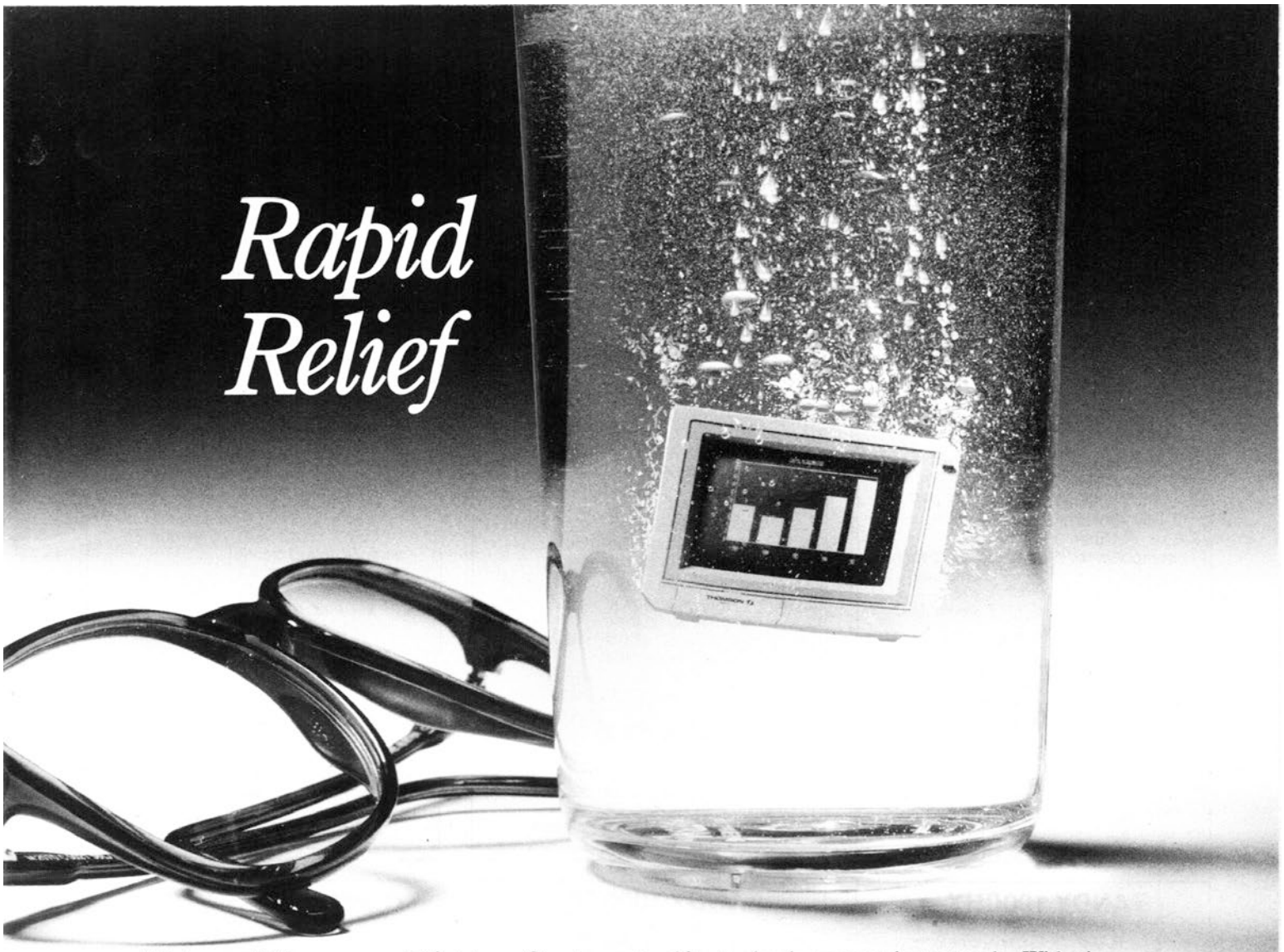
LOGI 88XT



Processor:	4.77/8MHz 8088V20
RAM:	640k
Keyboard:	101 key
Video:	Herc/CGA/640 x 400
Resolution:	mono 728 x 348 and 640 x 200 CGA
Interfaces:	parallel/screen/games ports/microsoft compatible moves connection
Disk drives:	360k or 720k floppy, 20mb or 32mb hd (optional)
Other components:	clock/calendar
Operating System:	MS-DOS 3.21
Price:	2FDD $2270 20mb $3080 32mb $3190
Features:	14" monochrome monitor –
Agents:	Lingo Computer Systems Ltd

TOSHIBA T1000

Processor:	4.77 MHz 80C88
RAM:	512kb
Video:	super twist LCD CGA adapter
Resolution:	640 x 200 (pixels)
Interfaces:	centronics parallel, RGB colour video, composite CRT, RS232, internal modem slot
Disk drives:	(1) 3.5" 720 kb floppy disk drive
Other components:	NiCad battery
Operating System:	MS DOS
Bundled software:	MS-DOS
Price:	$2795
Expansions:	memory expansion as 1.28Mb
Features:	MS-DOS in ROM, weight 2.9kg, battery powered
Agents:	Southmark Computers Ltd



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NEC MULTISPEED



Processor:	NEC V-30, 8086
RAM:	640kb
Keyboard:	85 key integrated
Video:	Detachable, 80 x 25
Resolution:	640 x 200 pixels
Interfaces:	RS-232 serial port, parallel printer port,
Disk drives:	dual 3.5" 720 Kb
Other components:	Sockets for programmable EPROMs,
Operating System:	MS-DOS 3.2
Languages:	GW Basic
Bundled software:	MS-DOS 3.2, in-built software: word processing, note pad, database, telecommunications.
Price:	$2985 (RRP ex tax)
Expansions:	internal modem, multisync monitor
Agents:	NEC Information Systems Ltd

REDSTONE RSV20

Processor:	NEC V20
RAM:	640
Video RAM:	64k
Keyboard:	AT style
Video:	monochrome monitor
Resolution:	1000 lines at centre
Interfaces:	serial and parallel
Disk drives:	2
Operating System:	MS DOS, CPIM-86
Price:	$1995
Expansions:	8 slots
Features:	Turbo
Agents:	Advantage Computers Ltd

VC-XT 88 TURBO

Processor:	8088
RAM:	640kb
Video RAM:	64k screen buffer on graphics card
Keyboard:	enhanced 101
Video:	monochrome graphics card with 12" high resolution
Resolution:	720L x 348V
Interfaces:	parallel
Disk drives:	two 360k disk drives
Operating System:	MS DOS
Languages:	
Price:	$1995
Expansions:	8 expansion slots
Features:	turbo operating system switchable 4.77/8 MHZ
Agents:	Viscount Electronics Ltd

TANDY 1000HX

Processor:	8088-2 7.14/4.77 MHz
RAM:	256, expandable to 640K
Keyboard:	90 key full size
Video:	80 x 25 lines CGA enhanced built in
Resolution:	640 x 200
Interfaces:	external disk drives/ parallel/composite video/headphone jack with volume control/2 joysticks/RGBI
Disk drives:	720kb (9cm)
Operating System:	MS DOS
Languages:	Basic included, other DOS languages optional
Bundled software:	Personal DeskMate 2
Price:	$1770
Expansions:	memory/co-processor/ hard drives/RS232/ battery clock
Features:	MS DOS in ROM/DOS shell/speaker-headphone jack with volume control
Agents:	Computer Advances Ltd

TANDY 1000TX



Processor:	80286 8/4MHz
RAM:	640kb
Video RAM:	optional 128kb
Keyboard:	90 key full size
Video:	enhanced CGA 80 x 25
Resolution:	640 x 200
Interfaces:	parallel/RS232/RGBI/ composite video/
Disk drives:	720kb 9cm (3.5in)
Operating System:	MS DOS
Languages:	Basic included,
Bundled software:	Personal DeskMate 2
Price:	$2650 inc GST
Expansions:	5 card slots/maths co-processor/memory/ hard drives/battery clock
Agents:	Computer Advances Ltd

COMMODORE PC5

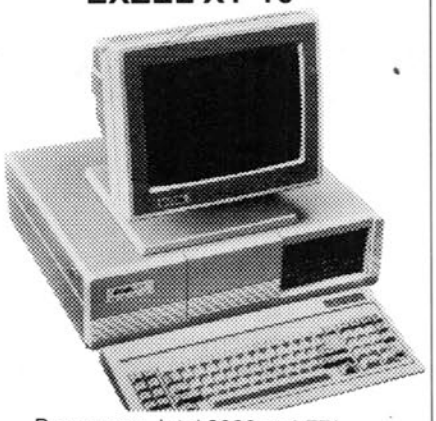


Processor:	8088 4.77MHz
RAM:	512k st
Video RAM:	4k
Keyboard:	85 key, full size,
Video:	monochrome
Resolution:	screen character 80 x 25
Interfaces:	25 pin RS232, 25 pin parallel (centronics)
Disk drives:	1 x 360k 5¼" floppy drive
Other components:	loudspeaker (internal)
Operating System:	MS DOS 3.2
Languages:	G.W. BASIC
Bundled software:	Able One
Price:	$ 1795 inc GST screen not included
Expansions:	5 full size expansion slots
Features:	diskdrive controller parallel and serial port controller
Agents:	Commodore Computer NZ Ltd

ACORN ARCHIMEDES 300 SERIES

Processor:	Acorn Risc Machine
RAM:	305-512k, 310-1Mb
Video RAM:	up to 320k
Keyboard:	101 style with mouse
Video:	analogue RGB, monochrome composite video
Resolution:	640 x 512 256 colours
Interfaces:	serial, parallel, stereo sound, optional econet LAN
Disk drives:	640k/800k 3.5", optional 20mb
Operating System:	BBC arthur, optional MSDOS
Languages:	BBC Basic, Fortran 77, C, Pascal, Lisp, Prolog.
Bundled software:	BBC Basic V, Editor, Music Editor, Picture Editor
Price:	$2995
Expansions:	Midi interface, I/o interface, hard disc drive, frame grabber ethernet, genlocker, IEEE 488
Features:	high speed processing, high res graphics, BBC and MSDOS compatibility
Agents:	Barson Computers NZ Ltd

EXZEL XT-10



Processor:	Intel 8088 at 4.77/ 10MHz
RAM:	640kb
Keyboard:	standard IBM PC/AT
Video:	Hercules compatible Hi-Res graphics
Resolution:	720 x 348 pixels
Interfaces:	I/O parallel (centronics) as standard
Disk drives:	single 360kb plus 10Mb hard disk
Other components:	8087 co-processor
Operating System:	MS-DOS, PC-DOS
Price:	$2200 plus GST
Expansions:	8 expansion slots total
Features:	fully upgradable to an XT-286 AT or AT-386.
Agents:	Computer Imports Ltd

EXZEL XT-20



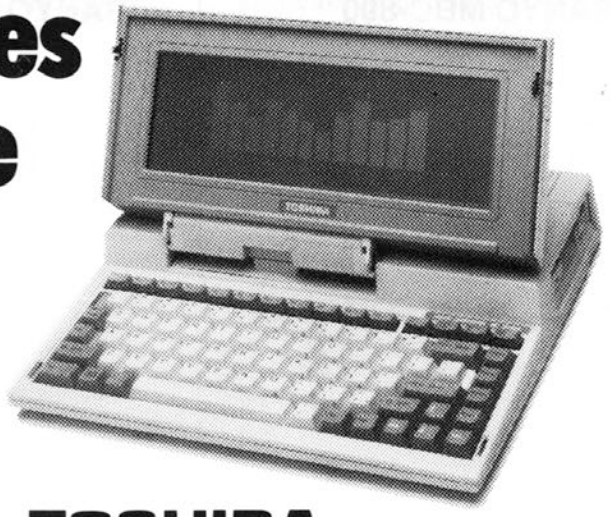
Processor:	Intel 8088 at 4.77/ 10MHz
RAM:	640kb standard
Keyboard:	IBM PC/AT layout
Video:	Hercules compatible Hi-Res graphics monitor
Resolution:	720 x 348 pixels
Interfaces:	I/O parallel (centronics) as standard
Disk drives:	single 360kb plus 20Mb hard disk
Other components:	8087 co-processor socket
Operating System:	MS-DOS, PC-DOS (not included)
Price:	$2700 plus GST
Expansions:	8 expansion slots total
Features:	fully upgradable to an XT-286 AT or AT-386.
Agents:	Computer Imports Ltd

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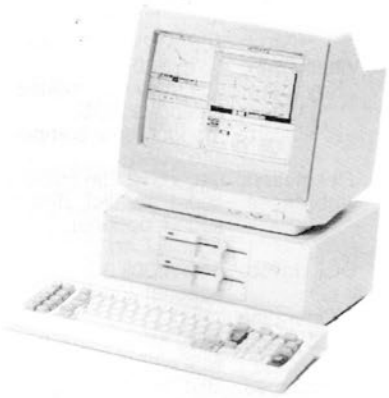
Processor:	8088 4.77MHz
RAM:	640kb
Video RAM:	64k
Keyboard:	85 key full size 3 tilt positions st qwerty layout
Video:	AGA card, displays monochrome graphics, (Hercules compatible) colour graphics (16 colours), supports RGBI and composite monitors
Resolution:	up to 720 x 348
Interfaces:	25 pin RS232, 25 pin parallel (centronics)
Disk drives:	2 x 360k 5¼" floppy drive
Other components:	loudspeaker (internal)
Operating System:	MS DOS 3.2
Languages:	GW Basic
Bundled software:	Able One
Price:	$2595 in c GST screen is not included
Expansions:	5 full size expansion slots
Features:	diskdrive controller, parallel and serial port controller built in to motherborad, west German design, robust construction
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SANYO MBC-775



Processor:	8088-2 (8MHz/ 4.77MHz switchable)
RAM:	256kb
Keyboard:	sculpture-type
Video:	colour display
Resolution:	640 x 200 dot
Interfaces:	centronics, parallel
Disk drives:	2 x 360k byte floppy disks
Other components:	optional 20/30/40 mb hard disk
Operating System:	MS DOS 2.11
Languages:	GW Basic
Bundled software:	Word Star 2000
Price:	$1865 inc GST
Expansions:	two full length expansion slots, optional 8087 coprocessor
Features:	portable, compact, colour computer, IBC compatible
Agents:	Sanyo NZ Ltd

SANYO MBC-16 PLUS



Processor:	8088-2
RAM:	640kb
Keyboard:	easy operation with sculpture-type keyboard
Video:	12 inch monochrome
Resolution:	720 x 350 dots
Interfaces:	centronics parallel RS232C serial
Disk drives:	360K 5¼ inch floppy drive (optional 20/30/ 40 Mb hard disk)
Operating System:	MS-DOS 3.2
Languages:	GW Basic 3.2
Price:	$2650 inc GST
Expansions:	3 x 8 inch slots optional 8087 coprocessor
Agents:	Sanyo NZ Ltd

SANYO MBC-890



Processor:	8088-2
RAM:	640kb
Keyboard:	sculpture-type
Video:	12 inch monochrome
Resolution:	720 x 350 dots
Interfaces:	centronics, parallel
Disk drives:	360k byte 5¼ inch floppy drive
Other components:	optional 20/30/40 mb hard disk not included in price
Operating System:	MS DOS 3.2
Languages:	GW Basic
Bundled software:	Word Star 2000
Price:	$2995 inc GST
Expansions:	7 fu ll length expansion slots optional 8087-2
Agents:	Sanyo NZ Ltd

SANYO MBC-670



Processor:	8088
RAM:	640kb
Keyboard:	sculpture-type
Video:	7 inch monochrome non-glare
Resolution:	640 x 200 dot
Interfaces:	centronics parallel and RS232C serial
Disk drives:	360K 5¼ inch floppy drive
Other components:	optional 20/30/40 mbytes hard disk not included in price
Operating System:	MS-DOS 2.11
Languages:	GW Basic
Bundled software:	WordStar 2000
Price:	$2870
Expansions:	two 8 inch expansion slots optional 8087 coprocessor
Features:	portable
Agents:	Sanyo NZ Ltd

EXZEL XT-2



Processor:	Intel 8088 at 4.77/ 10MHz
RAM:	640kb
Keyboard:	standard IBM PC/AT
Video:	Hercules compatible Hi-Res graphics
Resolution:	720 x 348 pixels
Interfaces:	I/O parallel (centronics) as standard
Disk drives:	dual 360kb plus 10Mb hard disk
Other components:	8087 co-processor socket
Operating System:	MS-DOS, PC-DOS (not included)
Languages:	Basic, Pascal, C, Cobol (not included)
Price:	$1800 plus GST
Expansions:	8 expansion slots total
Features:	fully upgradable to an XT-286 AT or AT-386.
Agents:	Computer Imports Ltd

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Easy to use. No need to constantly press keys. Leonardo recognises new games automatically and if you want to take back any number of moves Leonardo also guides you automatically. Replay the entire game, or watch Leonardo analyse alternative plans and give position evaluations continuously. With 32 skill levels, including special levels for tournament play, speed chess, analysis and problem solving up to Mate-in-20.

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The Cinderella service

by Judy Knighton

"Nobody reads manuals." That was the second encouraging thing they told me when I started work as a manual writer. The first one was, "Anyone can write a manual."

I argued. Told them I'd read some of the manuals anyone had written. Uniformly horrible. I even suggested that was why nobody reads manuals. "I can learn about your computers," I said, "far faster than you can learn to write."

I paid for my arrogance. They handed me an IBM compatible, a copy of the word processor PC-Write, a fledgling computer program that needed a manual... and left me to it. I wasn't worried. I had a Commodore 64. What could be so different?

Almost everything. In the first fortnight I fumbled my way around the word processor, made notes on the Time Costing program, badgered everyone else on the staff with inane questions, lived, ate and slept computers. I talked knowledgeably about booting up, looked wise when the programmers talked computerese, typed screeds in CAPITALS because I'd knocked Caps Lock, and pressed F1 to change scenes in my dreams.

But I learnt. And I wrote my first software manual.

I've read many manuals since, some of them very good, but a lot more depressingly bad. I've seen nothing to change my original opinion. Trained writers should be doing the writing – writers who have spent years learning how to communicate ideas to people while their computer-happy kin focus on how to talk to a machine.

That's the first of two reasons why software development companies should hire real writers, and it bears repeating. Writers know how to write.

"Wait a minute," I hear you say. "I know how to write. I went to school, and I pen a letter once a month to my mother in Nightcaps." I know writers who program, who can write software to test their kids' arithmetic. But if I want a software package I can splash all over the export market, I'll hire a trained professional, thanks.

Writers learn how to judge their audience, and slant their writing to the comprehension of the reader. They learn how to research, how to plan, how to organise a work into a logical sequence for maximum understandability, how to outline, how to keep writing when the words dry up, and how to rewrite critically. Their grammar is excellent, their spelling is usually above average, and most can touch-type. All of this means they can produce a good manual in half the time it takes your programmer to write a bad one.

Of course, you might find someone who is willing to learn the above skills. *But,* and this is the second

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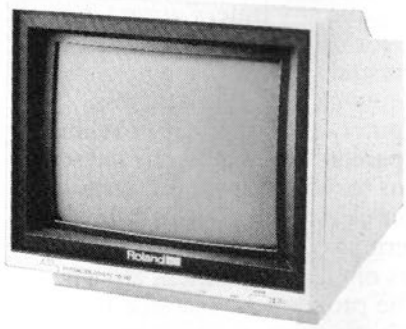
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reason for hiring writers, can you insist on them having a good time? Writers love writing.

Some of the programmers I know can write. Their "Read-me" files are small masterpieces. Their electronic memos are a joy. But every one of them would rather be marching barefoot over hot coals. Writers, on the other hand, enjoy stringing words together. They play Scrabble in their spare time. Some even read poetry. Feed them a little praise and the occasional pay cheque and they'll write away happily until the Crack of Doom.

Once you've hired a writer, you will find extra benefits. Most programs nowadays have extensive Help screens and windows. Your writer can knock out the text for them, freeing your programmer from a detested chore (and ensuring that said Help windows make sense).

Maybe you can see an opening in various magazines for articles about your firm, or other subjects that interest you. A trained, experienced writer can help you plan an outline, or can take the weight of the whole thing off your shoulders.

There are so many writing chores in the average company. What about company newsletters? As a firm grows, newsletters help to keep the staff informed and involved. They provide a human touch, sometimes much needed. You'll find, too, that your writer will quickly come to be regarded as living, instant access, thesaurus and grammar/spelling checker. Definite time advantage there.

You see? Far too much work for one writer. Better hire two.

Let's say you're convinced and you are going to start interviews. What do you look for? Someone who is good at writing explanations, who likes computers, who will get on with the other members of your team. (Another prima donna you don't need, right?) They don't have to know a lot about computers or your software, as long as they're able and willing to learn. But they do have to know how to write.

Wait a minute. Writers are word people, and word people don't like computers. True?

FALSE!

Now that I've learnt to use a processing package I could never go back to retyping draft after draft. I'd give up everything else before parting with my computer – house, furniture, van, cats, mother-in-law. (The choice between computer and kids would be a hard one.) Writer friends with computers feel the same. (And the writers I know have all either bought computers or are saving hard.)

Certainly writers don't approach computerware, hard or soft, with quite the same attitude as a software design engineer. But that is all to the good. Frequently, I am the first representative of the general public to touch a program. I look at it from the point of view of the user. How else to write a useful manual? Because of this different viewpoint, I often notice things that have not occurred to the designers. "Wouldn't it be easier for the user if it did this?" Perhaps when we have more writers in software design teams we will have more emphasis on user convenience and less on programmer convenience.

And the best thing about it, if I read the Employment Vacancies columns correctly, is that you can have the pick of writers to choose from. There are ads for programmers, systems analysts, project leaders, but none for writers. You have almost no competition. Yet.

So far, I haven't mentioned the writer's motivation. Why do I write software manuals? Simply, I like (among other things) writing, computers and spending money. To be paid for writing about computers is pure bliss.

In the 15 months from that first fortnight, I have picked up enough computerese to follow two out of three conversations in the programmers' room. I've written seven manuals totalling over 1800 published pages. Some of these are now on their third major rewrite, and one is coming up for a fourth.

I've rambled down the byways of desktop publishing. When I started, our manuals were printed on lineflow with a nine-pin dot matrix, photocopied and spiral bound. They are now standard size (A5), in ring binders, and I have learnt the typesetting program PC-TEX to prepare my photo ready copy. (I've also looked at other IBM compatible desktop publishing software, but will be sticking to TEX for the manuals, because it handles books so well.)

I've had a manual favourably mentioned in a review of its progtram.

I've bought an IBM compatible to use at home. Trouble is, the husband and children all want to use it, and I keep finding myself in a queue. I have fallen in love with a laptop, but I can see the same problem arising. I want to write the Great New Zealand Novel in the garden, catch up on letters in the bus, take notes in the library, and write articles in the air between Dunedin and Wellington. Husband thinks laptop are purpose-built for polytech tutors to take away to motels for two-week training courses. Maybe we'll have to get two.

All that aside, I love my job. I'm having a great time. And I continue to hope that someday someone might read one of my manuals. ■

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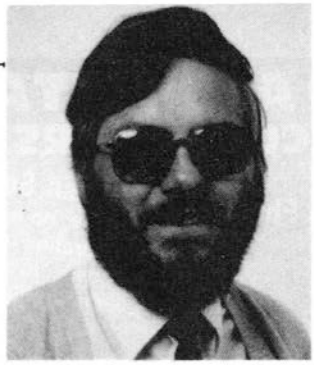
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Low-cost utilities

by Selwyn Arrow

Following on from last month's look at Automenu, from the Public Domain, I have been asked to write about my favourite utility PD programs. Two basic types of programs are available: Public Domain and Shareware.

Public Domain

The first are usually (but not always) short programs, written by someone for a particular purpose, usually to make some aspect of computer use easier for them. These have been donated by their authors for public use and have found their way into one (or more) of the major Public Domain disk collections.

And there are certainly plenty of them; my guess is that more than half the programs available from the major collections are in the Public Domain. Incidentally, the author of such a program usually reserves copyright for his or her program, and most copyright notices usually state that it is **not** to be sold or distributed for commercial gain in any way.

Shareware

These programs are usually much larger and in most cases are very sophisticated. Each must have taken very long hours for its author to write and improve upon, so it is not unreasonable that the author reserves the right to ask for a donation from anyone who tries the program and who plans to use it regularly. The suggested donation can be anything from $US25 up to $US99.

The idea is that the program is distributed along with the Public Domain disks so that you can try it out at minimal cost, and then if you like it you send the author the suggested donation. For this you quite often receive a properly printed manual, and can usually expect to receive updates as they are brought out.

This system has allowed some excellent programs to be released at minimal cost to the author, and for the better ones it usually reaps a well-earned reward for the time the author has invested.

Disk charges

Both types of program usually state that there is a limit of $10 that can be charged for copying, which causes some wonder about some of the "copying charges" advertised in this magazine! Even at the highest USA/NZ exchange rate they should be no more than $NZ12 to $NZ16.

In the true spirit of this requirement, all the programs and disks I mention here are quite often available for less than $10 from local computer clubs. Those lucky enough to live in Palmerston North can go along to Advantage Computers and do their own copying for free! The club with the largest known collection is the NZ Microcomputer Club Inc, which now has the entire current PC-SIG collection up to volume 705 plus many more disks from the PC-BLUE, PC-UK and San Jose collections. These are available to club members for the copying charge of $5 per disk. As one year's membership is only $35 and it covers many other benefits too numerous to go into here, it is well worthwhile joining.

PC-Write

I am writing this article with PC-Write version 2.6, a Shareware word processing program. I have only been using it for the last couple of months, but it compares very well with the commercial WP programs I have used. Version 2.6 comes with a 41-page Quick guide (.DOC) file and a 16-page tutorial. It was available on PC-SIG vol 78, but now that version 2.7 has been released as a two-disk set it is now on PC-SIG vols 78 & 627. It has some added features such as 45 help screens (only 40 in my version!) and a built-in spelling checker. Its only drawback is its limitation of a 60kb file size, about 30 pages. Very highly recommended. Registration is $US89 and for that you get a hardbound manual, updates and even commission on registered copies you supply!

The copying service is available via post as long as you send pre-formatted, labelled disks and provide the correct return postage, and each label must show your name and the disk volume number you require. The NZ Micro Club, P.O. Box 6210, Auckland has more details (please include a stamped addressed reply envelope), and remember that it is a voluntary organisation with all the work (including disk copying) being done in someone's spare time.

I would suggest that you first obtain the four PC-SIG catalog disks so that you can choose from the multitude of offerings. Printed copy of these is a pile of paper about 50mm high so of course it is not avaialble. Instead, a scan utility is provided to locate and read volume and file information on the disks. A short (12kb) PC-SIG index is also available for downloading by Micro Club members on the MICRO FIDO BBS, (09) 498-315, as are the first programs I am about to describe.

My favourite utilities

First prize goes to a file listing program called LIST.COM, my current version being 5.68. Its function is to display the contents of an ASCII text file of any size. It offers: scrolling up down left and right, finding text regardless of case, scanning for case sensitive text, printing text, help screen and more. An eight-page LIST.DOC file is also provided. I have renamed my copy to just L.COM as it makes life easier, and to use it I just type L (disk:)(path)filename(.ext). The items inside the brackets are optional, of course.

Next most useful is WHERE3.EXE which is invaluable for a busy hard disk, as it will search for every occurrence of a file or part of a filename. I use it to locate programs that have not been used for a while, or to see if a particular program is on my system. Again I have shortened its name to WHERE.COM.

A program I use all the time is simply called CLOCK-ON, which is installed in my AUTOEXEC.BAT file and appears as a 24-hour clock in the top right hand corner of my screen. If it should get in the way of a particular program I just type CLOCK – and it is gone. It also has an alarm setting that beeps when I set hh:mm:ss.

Again space has run out on me this month, so I will continue later with more of my PD favourites plus some programs that have been highly recommended by users. We now have a DOS Forum running on MICRO FIDO (09) 498-315 so if you have a modem why not tune in to see what's new? Don't forget to drop me a note there.

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Trying it until it works

Almost everybody I know who owns a computer has at some time tried to write a program on it. Most of us who have tried to program a computer probably started with a language such as Basic and, probably depending on how successful you were and how much help you had, you might have "progressed" to a programming language such as Pascal or C.

I write 99.9 per cent of all my programs in Turbo-Pascal, the Pascal compiler generally known as the unofficial industry standard. In this semi-regular column, I would like to share and discuss some topics and techniques that I have gained by doing things the hard way: trying it until it works.

Although techniques will be illustrated in Pascal, they are generally applicable to other languages. The reason I like Pascal for examples is that it is reasonably self-documenting, which means that by choosing variable, procedure and function names cleverly, source code can be very close to English.

What I will assume, however, is that you have the most rudimentary knowledge of Pascal: the syntax and general structure of the code.

The beauty of block-structured languages such as Pascal is that you can write modular solutions easily. All you really need to know are what function it performs, what information it needs to work on, and how to interpret the results. I have acquired several routines in which I shove something in the front, pull the result out of the end, and have absolutely no clue how it was done. For any serious programmer it is very important to collect a library of these routines, whether they are yours or not.

One routine that you will find in any program I write is one that determines what type of display adapter is being used on the computer. I need to know this because I always write directly to the screen memory. To do this I need to know its location.

Table 1. ($B000 = B000H = &HB000)

Adapter type:		Address:
Monochrome	(MDA,Hercules)	$B000:$0000
Colour	(CGA)	$B800:$0000
Enhanced Graphics Adapter	(EGA)	$A000:$0000
	...or	$A800:$0000

Table 1 shows the starting addresses of the various display adapters. One way to find out is to ask the computer to tell you, which can be done with a BIOS call. The BIOS is the chip in your computer that has all sorts of handy little routines that you may need from time to time. It is used by Pascal itself, but sometimes we need to get down and use it ourselves.

Turbo Pascal provides a very convenient way of doing this, and the routine in Listing 1 gives an example.

You may have noticed that this method only reports back whether you have a monochrome or colour adapter. As a matter of fact, it only confirms that you have a colour adapter, and it's up to you to deduce that if it is not a colour then it must be a monochrome (or an EGA).

We therefore have to find a more precise way to see what adapter we are using. the second way to do it is by interpreting the **current display page.** The computer has 15 of them as illustrated in Table 2.

Table 2.

Page:	Adapter:
0,1,2,3,4,5,6	CGA
7.	Monochrome
8,9,10	not applicable to us
13,14,15,16	EGA

BIOS or direct memory

There are two ways of finding out which actual display page is used. We can use the same BIOS call, or we can do the unthinkable: inspect a direct memory location. Listing 2 shows how to do both. As a matter of fact, the BIOS call does more or less the same as we do in Listing 2, Example2, Method1.

Now that we know what display is being used, what do we do with it? You may have noticed that the off-the-shelf programs pop their screens on your monitor, while yours are definitely showing the tell-tale signs of slow writing. If we know the display page that is being used, we know the starting address of it: $B000 for mono, $B800 for colour, and $A800 (page 13, 14, 16) and $A000 (page 15) for EGA. This will allow us to manipulate our screens directly.

One built-in Turbo-Pascal procedure will make all this very possible:

Move (Type1,Type2,BytesToMove);

This procedure moves BytesToMove from Type1 to Type2. And Type1 and Type2 do not even have to be of the same type as the bytes are swapped directly over. This allows us to set up a background screen in which we can quickly put the existing one for later use. An example can be found in Listing 3.

How can we use it properly then? To do a pop-up window, first save the

by Peter Belt

screen, then write the pop-up window directly to the screen, and when you have finished with it, swap the saved screen back. This will give the very definite illusion of the smaller superimposed part of the screen 'popping'! Next time we will have a closer look at the screen, and discuss an even better way to save and manage screens in memory.

(To keep his facts straight, Peter has consulted *The Peter Norton Programmer's guide to the IBM PC*, which both Peters recommend to anyone who is serious about programming. All source code in this column is available for $7.50 incl GST from JPS Services, P.O. Box 73039, Auckland International Airport.)

Listing 1.

```
PROGRAM Example1;
{ Reports whether a Colour adapter is being used }

CONST
  Mono          = $B000;
  Colour        = $B800;

VAR
  Adapter       : Integer;

  PROCEDURE TheAdapterUsedIs(VAR MonoOrColour: Integer);
  {-------------------------------------------------}
  VAR
    Registers   : RECORD      { Special register record }
                    Ax,Bx,Dx,Cx,
                    Bp,Si,Di,Ds,Es,Flags  : Integer;
                  END;
  BEGIN
    Registers.Ax:=$0F00;
    Intr($10,Registers);      { Pascal procedure to request }
                              { a BIOS 'report'             }
    IF Lo(Registers.Ax)=3
      THEN MonoOrColour:=Colour
      ELSE MonoOrColour:=Mono;
  END;

BEGIN
  TheAdapterUsedIs(Adapter);
  IF Adapter=Colour
    THEN WriteLn('Colour - CGA')
    ELSE WriteLn('Mono - Hercules');  { OR EGA !!! }
                                      { See text.  }
END.
```

Listing 2.

```
PROGRAM Example2;

CONST
  Mono          = $B000;
  Colour        = $B800;
  EGA1          = $A800;
  EGA2          = $A000;

VAR
  Adapter       : Integer;

  PROCEDURE Method1;
  {---------------}
  BEGIN
    CASE Mem[$0000:$0449] OF
      1,2,3,4,5,6   : BEGIN
                        WriteLn('CGA - Colour');
                        Adapter:=Colour;
                      END;
      7             : BEGIN
                        WriteLn('MONO - Hercules');
                        Adapter:=Mono;
                      END;
      13,14,15,16   : BEGIN
                        WriteLn('EGA - Enhanced colour');
                        IF Mem[$0000:$0449]=15
                          THEN Adapter:=EGA2
                          ELSE Adapter:=EGA1;
                      END;
    END;
  END;

  PROCEDURE Method2;
  {---------------}
  VAR
    Registers   : RECORD      { Special register record }
                    Ax,Bx,Dx,Cx,
                    Bp,Si,Di,Ds,Es,Flags  : Integer;
                  END;
  BEGIN
    Registers.Ax:=$0F00;
    Intr($10,Registers);
    CASE Lo(Registers.Ax) OF
      1,2,3,4,5,6   : BEGIN
                        WriteLn('CGA - Colour');
                        Adapter:=Colour;
                      END;
      7             : BEGIN
                        WriteLn('MONO - Hercules');
                        Adapter:=Mono;
                      END;
      13,14,15,16   : BEGIN
                        WriteLn('EGA - Enhanced colour');
                        IF Mem[$0000:$0449]=15
                          THEN Adapter:=EGA2
                          ELSE Adapter:=EGA1;
                      END;
    END;
  END;

BEGIN
  Method1;
  Method2;
END.
```

```
PROCEDURE AlterTheScreen;
{----------------------}
{ Alters the screen so it is not in original condition }
BEGIN
  Window(12,12,38,18);
  ClrScr;
  GotoXY(3,3);
  WriteLn('Hello!');          { Any old rubbish... }
  WriteLn('Hello??????');     { ... and more of it }
  Window(1,1,80,25);
END;

BEGIN
  GetAdapter;
  MakeAScreenToUse;
  SaveTheScreen(BackGroundScreen);
  AlterTheScreen;
  Delay(2000);                        { Change to suit }
  RestoreTheScreen(BackGroundScreen);
END.
```

Listing 3.

```
PROGRAM Example3;
{ Demonstrates a quick method to save a screen and return  }
{ it at a later time                                       }

TYPE
  ScreenType          = ARRAY[1..4000] OF Byte;
                        { The size is 4000 bytes due to  }
                        { 2000 characters and 2000       }
                        { attributes (about that later)  }

VAR
  Adapter             : Integer;
  BackGroundScreen    : ScreenType;
                        { Storage for 'background' screen }

PROCEDURE GetAdapter;
{------------------}
{ Quick and dirty way to get the current display page }
BEGIN
  CASE Mem[$0000:$0449] OF
    1,2,3,4,5,6   : Adapter:=$B800;
    7             : Adapter:=$B000;
    13,14,16      : Adapter:=$A800;
    15            : Adapter:=$A000;
END;

PROCEDURE MakeAScreenToUse;
{------------------------}
{ Creates a screen to be saved }
VAR
  I             : Integer;          { counter }
BEGIN
  ClrScr;                           { Clears the screen }
  FOR I:=1 TO 2000 DO               { 80x25 characters per screen }
    Write('X');
END;

PROCEDURE SaveTheScreen(VAR Screen: ScreenType);
{---------------------------------------------}
{ Copies 4000 bytes from a Memory location starting at }
{ address Adapter:$0000 into Screen                    }
BEGIN
  Move( Mem[Adapter:$0000], Screen, 4000 );
END;

PROCEDURE RestoreTheScreen(VAR Screen: ScreenType);
{------------------------------------------------}
{ Copies 4000 bytes from Screen back into the memory }
{ starting at address Adapter:$0000                  }
BEGIN
  Move( Screen, Mem[Adapter:$0000], 4000 );
END;
```


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Useful and accurate

a book review by David H. Smith

Newnes Computer Engineer's Pocket Book
Michael Tooley
Published by Newnes, $29.95.

Technical computer books are not all that common and I regularly scan the shelves of libraries and bookshops looking for books to further my knowledge of computer hardware. I was therefore very pleased to see that the Newnes *Pocket Book* is now available in New Zealand.

I carried it around with me for three weeks to see how useful it would be, and during that time the little book proved to be a goldmine of ready information. Sure, most of the information contained in it is already available, but Michael Tooley has cleverly brought together and condensed some of the most important information.

When I do find a book relating to hardware I invariably judge it on three points. How useful is it? How dated is it? How accurate?

In spite of the title, the author has written the book for the 'Software Engineer', the name he gives for the computer professional whose work now encompasses hardware, software and telecommunications. A distinct departure from similar pocket books is that not all the book is given over to tables, charts and diagrams, but Michael Tooley has written a good deal of text, which is very informative and readable.

The book was published in 1987, but I think Newnes must have had the author's manuscript for a couple of years prior to publication. For instance the CPU chip of the IBM PC/AT, the 80286, only gets a very passing mention and the 80386 does not appear at all. While the V21 and V23 modem standards are listed, there is no mention of the now-popular V22 standard. However, this is a first edition and I am sure that subsequent editions will be closer to the state of the art in this fast-changing field.

The scourge of computer hardware books is the unreliability of some of them. Some books are pathetically inaccurate and have obviously been written by journalists with little technical experience. Most books on computer hardware have mistakes – but not this one. Michael Tooley knows his subject and the information in the book can really be trusted.

This book should appeal to many computer professionals – not just hardware engineers. I highly recommend it.

What's a split second?*

a book review by David Cass

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Rex Malik
published by Angus and Robertson, $7.95 incl GST

December is the season of the office party, and among the goings-on there's usually somebody trotting out the same old computer jokes! Get your nose into this book and you may be able to counter with a few of your own.

They are not all one-liners, or the sort you can tell over a jug of beer or glass or two or wine, as some of them depend on the written word for their humour and others are cartoons, but there should be some at least to tickle anyone's sense of humour. Author Rex Malik has cast his net pretty wide, so there's a few fresh ones in there, including a collection of prize-winners from the British Times/CMG Computing Humour Competition, plus a couple of Russian jokes and one French cartoon.

For your $7.95 you get 92 pages, with 15 cartoons, including one "Andy Capp", a selection of hilarious definitions, and 12 pages on "The Definitive Laws of Computing", including offerings from Bouggere (really!), Caan, Ginsberg, O'Toole, Peter, and others, and of course, Murphy! There is a whole chapter of IBM jokes, includiong the Virtual Universe Operating System, and you will find some answers to the question "How many programmers does it take to change a light bulb?", if you really want to know.

Lots of other gems, short and long, are included, and for once in the computer book world, it's value for your dollar. A nice present for Christmas, or the holiday break!

* It's the amount of time between quitting a program and realising you haven't saved any of the work you have spent the last seven hours on.

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Lingscrol

by Joe Colquitt

This month we'll take a first look at scrolling, a graphics feature seen almost every time you use your machine. Future articles will cover pseudo-, bit-map, fine, and interrupt scrolling.

Besides its widespread use in games, scrolling has applications in more serious programs, such as word processors and spreadsheets. The two sorts of programs generally have their own particular scrolling. Games seem to be predominantly fine scrolled, ie one pixel at a time, while business-type programs tend to have a coarse scroll, ie 8 pixels or one character at a time. Because 'serious' programs use only whole characters, a coarse scroll is all they need. Examples cited in the articles are fairly general, and will probably run more smoothly if adjusted to fit your program.

First to be covered is the techique of coarse scrolling, which you need to understand because it's a prerequisite for fine scrolling. As I was swamped by a deluge of absolutely nobody else's ideas, I can offer only my views on the subject. For those unfamiliar with scrolling, it's the process of shifting the screen, or a portion of it, so that as text or data is moved off, new data is brought onto the opposite side.

At this stage I should point out that to be visually effective, all of these operations should be done in machine language. Readers who have been keeping up with the Machine Language column will be competent enough to design their own routines, based on those shown here. Some areas of scrolling are, naturally, commercially valuable and not documented. I will stubbornly continue picking other people's programs to bits for you, and present techniques as I dismember them (still time to get those routines in folks!).

There is no acceptable Basic code to perform horizontal scrolling, but upward coarse scrolling can be done in Basic by using SYS59626. For your digestion this month, here are the more common whole/part-screen coarse scrolls.

Listed below is a typically simple right-to-left coarse scroll. This is the hardest to achieve smoothly, mainly because of interference caused by the raster scan, which goes from top to bottom, left to right, of the screen. Thus, a scroll opposing the direction of the screen refresh will not be as smooth as one that goes with it.

A curious phenomenon occurs, however, if fewer screen lines are scrolled. The scroll routine can outpace the raster, and an apparent pixel scroll results, even when moving only whole characters. If you try fewer lines, note how the screen is 'bent' the faster the scroll goes. I'm sure this is an optical illusion and nothing to do with Einstein's Theory of Relativity. (If it was, would it mean a screen that did more fast scrolling would age less than one that didn't?)

By changing the values of registers or start addresses, any rectangular portion of the screen can be scrolled. For example, setting X at $C096 to #$0A would scroll only 10 lines. LDY#$14 at C09D scrolls the right half of the screen. LDY#$00, CPY#$14 scrolls the left half and so on.

By successively adding 40dec to the values at C089 and C08D (and incrementing the #$04 if necessary), the scroll starts at successive lines down the screen. To find the address of any screen line, use the formula HIGH%=(1024+LINE#*40)/256:LOW=((1024+LINE#*40)/256)-HIGH%*256. This gives a low and high byte value, which are Poked into zero-page.

Space doesn't permit an explanation of zero-page indexing, which has been fully covered in the ML column. After you've performed a scroll, you'll need a subroutine to put new data to the screen, which will involve at least one external counter. Remember that if you scroll one way, when you scroll back the other way, the original data should come back. ■

up

```
C000 LDA#$00
C002 STA$F8
C004 LDA#$28
C006 STA$FA
C008 LDA#$04
C00A STA$F9
C00C STA$FB
C00E LDX#$18
C010 LDY#$27
C012 LDA($FA),Y
C014 STA($F8),Y
C016 DEY
C017 BPL$C012
C019 DEX
C01A BEQ$C038
C01C CLC
C01D LDA$F8
C01F ADC#$28
C021 STA$F8
C023 LDA$F9
C025 ADC#$00
C027 STA$F9
C029 CLC
C02A LDA$FA
C02C ADC#$28
C02E STA$FA
C030 LDA$FB
C032 ADC#$00
C034 STA$FB
C036 BNE$C010
C038 LDY#$27
C03A LDA$D012
C03D STA$07C0,Y
C040 DEY
C041 BPL$C03A
C043 RTS
```

down

```
C044 LDA#$C0
C046 STA$F8
C048 LDA#$98
C04A STA$FA
C04C LDA#$07
C04E STA$F9
C050 STA$FB
C052 LDX#$18
C054 LDY#$27
C056 LDA($FA),Y
C058 STA($F8),Y
C05A DEY
C05B BPL$C056
C05D DEX
C05E BEQ$C07C
```

simple stick code

```
C120 LDA$DC00
C123 CMP#$7F
C125 BEQ$C120
C127 CMP#$7E
C129 BNE$C12E
C12B JSR$C000
C12E CMP#$7D
C130 BNE$C135
C132 JSR$C044
C135 CMP#$7B
C137 BNE$C13C
C139 JSR$C088
C13C CMP#$77
C13E BNE$C143
C140 JSR$C0CD
C143 CMP#$6F
C145 BNE$C120
C147 RTS
```

fill screen

```
C148 LDX#$00
C14A LDA$D012
C14D STA$0400,X
C150 STA$0500,X
C153 STA$0600,X
C156 STA$0700,X
C159 LDA#$03
C15B STA$D800,X
C15E STA$D900,X
C161 STA$DA00,X
C164 STA$DB00,X
C167 INX
C168 BNE$C14A
C16A RTS
```

left to right

```
C0CD LDA#$00
C0CF STA$F8
C0D1 LDA#$01
C0D3 STA$FA
C0D5 LDA#$04
C0D7 STA$F9
C0D9 STA$FB
C0DB LDX#$19
C0DD LDA$D012
C0E0 BNE$C0DD
C0E2 LDY#$26
C0E4 LDA($F8),Y
C0E6 STA($FA),Y
C0E8 DEY
C0E9 BPL$C0E4
```

```
C060 SEC
C061 LDA$F8
C063 SBC#$28
C065 STA$F8
C067 LDA$F9
C069 SBC#$00
C06B STA$F9
C06D SEC
C06E LDA$FA
C070 SBC#$28
C072 STA$FA
C074 LDA$FB
C076 SBC#$00
C078 STA$FB
C07A BNE$C054
C07C LDY#$27
C07E LDA$D012
C081 STA$0400,Y
C084 DEY
C085 BPL$C07E
C087 RTS
```

```
C0EB INY
C0EC LDA$D012
C0EF STA($F8),Y
C0F1 DEX
C0F2 BEQ$C110
C0F4 CLC
C0F5 LDA$F8
C0F7 ADC#$28
C0F9 STA$F8
C0FB LDA$F9
C0FD ADC#$00
C0FF STA$F9
C101 CLC
C102 LDA$FA
C104 ADC#$28
C106 STA$FA
C108 LDA$FB
C10A ADC#$00
C10C STA$FB
C10E BNE$C0E2
C110 RTS
```

right to left

```
C088 LDA#$00    ;get start addresses
C08A STA$F8     ;into zero-page pairs
C08C LDA#$01    ;ie F8/F9=0400
C08E STA$FA     ;   FA/FB=0401
C090 LDA#$04    ;ie FA/FB=F8/F9+1 char
C092 STA$F9     ;
C094 STA$FB     ;
C096 LDX#$19    ;X=# of lines to scroll
C098 LDA$D012   ;wait for raster to be off
C09B BNE$C098   ;screen (minimises jitter)
C09D LDY#$00    ;Y=chars per line
C09F LDA($FA),Y;get source data
C0A1 STA($F8),Y;move it 1 char left
C0A3 INY        ;repeat for rest of line
C0A4 CPY#$27    ;till 40 chars
C0A6 BNE$C09F   ;
C0A8 LDA$D012   ;get random data, store
C0AB STA($F8),Y;F8/F9+27 ie right edge
C0AD DEX        ;lines=lines-1
C0AE BEQ$C0CC   ;if lines left=0 exit
C0B0 CLC        ;else add #28 (40dec)
C0B1 LDA$F8     ;to low byte of address
C0B3 ADC#$28    ;
C0B5 STA$F8     ;
C0B7 LDA$F9     ;if carry generated
C0B9 ADC#$00    ;then add to high byte
C0BB STA$F9     ;
C0BD CLC        ;ditto for source
C0BE LDA$FA     ;
C0C0 ADC#$28    ;
C0C2 STA$FA     ;
C0C4 LDA$FB     ;
C0C6 ADC#$00    ;
C0C8 STA$FB     ;
C0CA BNE$C09D   ;jump back for new line
C0CC RTS        ;exit
nb random data in these examples could
be replaced by a JSR to a sub-routine
to get your own data. eg replace
 C0A8 LDA$D012 with JSR$ new data routine
```

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Privacy and access control



by Roger Hicks

Living down on the underside of the world, miles from anywhere, it is easy to get overlooked by those that are up on top. Our small population and economy, our relative isolation and our lack of high profile computer research have meant that New Zealand's presence on the world scene is notable for its absence.

When a major international computer magazine discusses us, it can be seen as a significant event; when nearly a whole page of complementary editorial is published, that's a huge success.

The *UNIX/WORLD* magazine for October 1987 contains just that: an article about the Unix scene in Australia and New Zealand, and nearly half of it is devoted to Godzone.

Highlighting the small size of the installed base and the large number of Unix boxes available, the article assesses the Unix software industry as being well-educated and competent. However, the small size of the marketplace is a major problem in the supply of software, and *UNIX/WORLD* considers that efforts being made in this area could easily result in the doubling of hardware sales in the coming twelve months.

This review of Unix in New Zealand refers to the significant impact that has been made by the Unix User Group. Describing the annual Unix conference as being "the most unusual and arguably the best Unix gathering in the world today", the article ends with a final exhortation for "Unix aficionados" to be sure to attend the 1988 conference.

File security

One of the things that distinguishes a multi-user system from a single-user one is that of file security. I don't mean the file security that you get by ensuring you have copies backed up on floppy disks and stored in your grandmother's bottom drawer. Neither do I mean the file integrity gained by having a proper file or record locking system. No, I mean the security of knowing that your files are not being read or, what's more, changed without your knowledge or agreement.

There are many different methods that operating systems can use to provide levels of privacy and access control. Unfortunately, complex, powerful, highly flexible schemes usually become so tedious to implement that systems administrators and users become disenchanted and don't use them.

At the other end of the scale, there are schemes that are so simplistic that they're not much use at all.

The approach taken by Unix is elegant, simple and requires minimal extra effort to use. The result is that Unix provides a good level of file security, easily.

Every file in Unix is owned by somebody, normally the creator of the file. This provides the basic division that is used in Unix file security: there is the owner of the file, and everyone else (or the general public).

This view of the world (from the file's point of view) is usually too simplistic. My spreadsheet is referred to by my colleagues and the order processing files will be accessed by all the order entry clerks. In other words, there are groups of users that need to have a different level of file access to that specified for the general public. However, they don't need all the power of the file's owner.

When someone logs up to a Unix system he or she is automatically made part of a group, the members of which are chosen because they have common file security and access requirmeents. For example, the members of a programming project will be in one group, and the typists and administration staff will be in another.

Unix file security is based on these three divisions: the owner, the owner's group, and the general public. Anyone accessing a file is considered to be either the owner (represented by the letter o), a member of the owner's group (the letter g), or a member of the general public (the letter p).

Unix takes a positive approach to file security, permitting actions rather than restricting them. If a file has the appropriate permission code set for you, then you are allowed to perform that action on the file.

What are the types of access that are permitted on a file? Unix permits reading or writing and specifies them using permission codes 'r' and 'w'. Alternatively, if the file is a program, or executable file, then permission code 'x' will allow it to be used.

Unix, therefore, has a matrix of permission codes: three types of user and three types of access. For each of the three classes of user (o, p, g) there are three permission codes (r, w, x). These nine permissions are represented by a sequence of nine codes found at the beginning of each line in a Unix directory listing. A dash at the beginning of the line indicates that this is an ordinary file, the sort we are talking about.

After the first dash, the following three codes show the permissions for the file owners. They are always shown in the order 'rwx' and the appropriate code letter is used if the owner is permitted to use that type of access. A dash is used to show that the access is not allowed. Similarly, the next three permission codes are used to show the permissions allowed to someone in the same group as the file's owner, and the rightmost three codes are used for those people who are neither the owner nor in his group, or in other words a member of the general public.

Thus the directory listing showing '--rw-r--r--' means that the owner of the file may read and write to the file, but everyone else may only read it. The sequence '--wx--x---' shows that the owner may execute or overwrite the file and members of the owner's group may execute it. However, no-one else has any access to the file.

The Unix utility 'chmod' is used to change file security permissions.

This program uses the codes 'o', 'g' and 'p' to describe whose permissions are to be changed. The codes 'r', 'w' and 'x' are used to indicate which permission codes are being changed and the symbols '=', '+' and '-' to show the change required. The equals sign shows that the permissions codes are to be set exactly as specified, the plus that the current permissions are to be added to as shown and the minus that the permissions are to be removed.

An example will show that this not as complex as it sounds. The command 'chmod g+r mydata' will add read access to the group permissions for 'mydata'. Similarly the command 'chmod o=x myprog' will make 'myprog' executable by me (the owner), with no other access allowed.

Using this program it is possible to set any of the 511 feasible combinations of permissions, including removing all access from yourself as file owner. But don't worry, you'll be able to change them back again just as easily.

This approach to file security is straightforward, consistent, easy to use and, above all, provides all the necessary components for file security that is as strict as you wish to make it. ■



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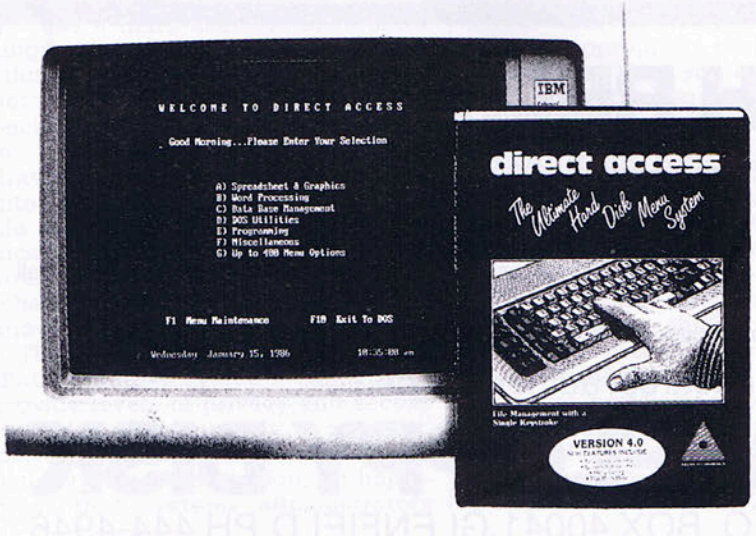
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Dear Sir,

I read with interest your correspondent Jankowski's letter on page 74 of your November issue dealing with the cost of upgrading his Microsoft QuickBASIC package that he purchased from the US.

The following facts are pertinent:–

- The cost of a QuickBASIC upgrade to a user who purchased a Brimaur-sourced copy via our dealer network is $95 plus GST. For those users who elect to obtain their Microsoft products outside the normal NZ distribution network then a higher upgrade price is charged that more properly reflects our costs.

  Such costs, inclurred in sourcing and administering upgrade services and components, are considerable. Whilst we want to provide this service to our NZ end-users at the lowest possible price, we have no such obligation to those who purchase elsewhere.
- Your correspondent is no more forced to buy his upgrade from us than we are forced to sell it to him. We only have an obligation to upgrade those packages originally imported by Brimaur. May I suggest he source his upgrade and any support he requires from whence he obtained his package.
- The NZ RRP for QuickBASIC is $195 plus GST, not $299. A major Auckland computer dealer, Financial Systems, quoted the Borland Turbo BASIC Compiler at an RRP of $225 plus GST.
- Answering Mr Jankowski's musings about the cost of the latest PC WORD upgrade to version 3.1, it is $65 plus GST. All upgrade costs include return by courier service.
- The RRP is for Word 3 is $995, and the wholesale price is a matter between Brimaur and its dealers. Happily your correspondent signs himself as BSc(Econ) so he is probably equipped to judge for himself that the wholesale price would be less than the "about $900" mentioned in his letter.

As a piece of helpful guidance, I would suggest Mr Jankowski check with his local dealer from time to time so that next time he puts pen to paper he has a fair chance of writing about facts.

Brian Eardley-Wilmot
Managing Director,
Brimaur Computer Services

A privileged deal

Dear Sir,

Ashton-Tate is sending conflicting signals to software users. On the one hand they say "piracy is theft", which if not technically correct is a fair representation of the ethics of software piracy.

On the other hand they offer pirates an "amnesty" which in fact is more than an amnesty: it amounts to a privileged deal for software pirates.

This move may please the pirates, although one wonders how many will want to pay up to 40 per cent of retail for a product which they have already acquired illicitly at no charge. Legitimate users who have paid full price for the product, and those who have gone without Ashton-Tate products because they could not afford Ashton-Tate prices, will not be impressed.

Do Ashton-Tate really see pirates as the prodigal sons of the software industry? Are those who have respected the rule of copyright to be cast in the role of the spurned elder brother? Whatever the Biblical precedents, a policy which favours the dishonest user at the expense of the honest one is ethically unacceptable, and ultimately will hurt rather than help Ashton-Tate's position in the market place.

Geoff Fischer,
Whangarei

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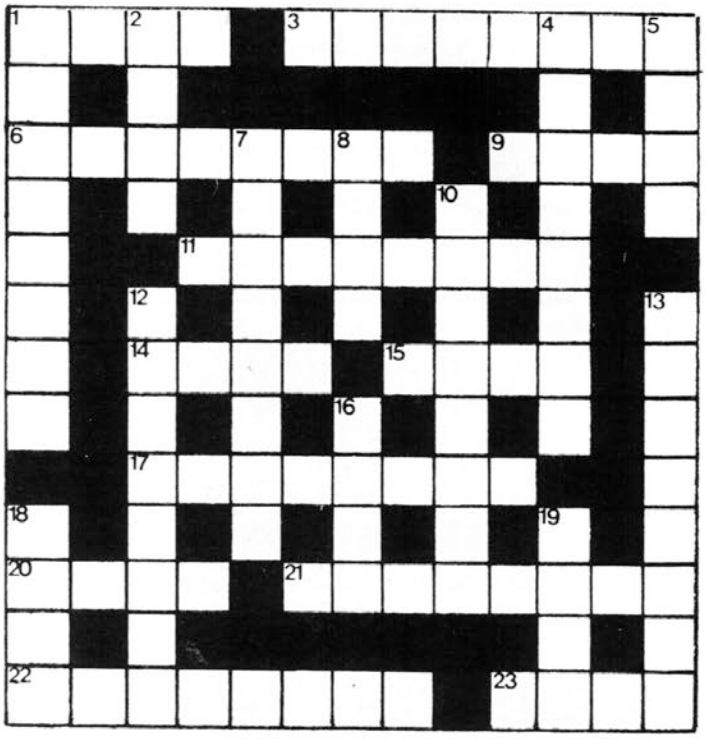
compiled by David Cass

Across

1. To copy a program or document in the computer memory onto a storage medium. (4)
3. One of the classic early computer games, involving knocking bricks out of a wall! (8)
6. A removable assembly of disks for easy placing on, and removal from, a disk drive. (4/4)
9. The number prefix signifying one trillionth. (4)
11. Describing memory which is unable to retain data when the power is switched off. (8)
14. The abbreviation for "Mean Time To Repair", an important figure for all equipment purchasers! (4)
15. To prepare or correct data or text for subsequent processing. (4)
17. Equipment with usually a visual display and keyboard, allowing communication with a computer. (8)
20. The abbreviation for the International Federation of Information Processing. (4)
21. Word processing term to describe the transfer of a word too long for the remaining line space onto the next line, without hitting return. (8)
22. One million bytes. (8)
23. A symbolic or pictorial presentation on screen of a program command. (4)

Down

1. One of the first and most successful pop-up utility programs. (8)
2. Abbreviation for Very Large Scale Integration. (4)
4. Major European computer and office equipment manufacturer, provider of AT & T's Personal Computer of 1984. (8)
5. The acronym for on-screen diagnostic tracing of program errors. (4)
7. Equipment (plural), used to draw graphs, charts, or graphics, from dots and straight lines, based on x and y coordinates. (8)
8. US manufacturer of top supercomputers. (4)
10. Term used in sorting routines, to indicate a very loose or unspecific sorting parameter. (8)
12. The "E" of LED. (8)
13. Device containing a photo sensitive cell in its tip, that interacts with bar code or computer screen to communicate with the computer. (5/3)
16. The classic acronym describing the principle that unreliable data produces unreliable results. (4)
18. The Cambridge – – – – was a pioneer Local Area Network, developed in the UK by Cambridge University. (4)
19. Early home computer that rivalled the Vic-20 and Spectrum, but offered Forth as an alternate language! (4)



Last month's solution



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Here's some advice on accounting software from a motel proprietor and a freight forwarder . . . (. . . and an accountant.)

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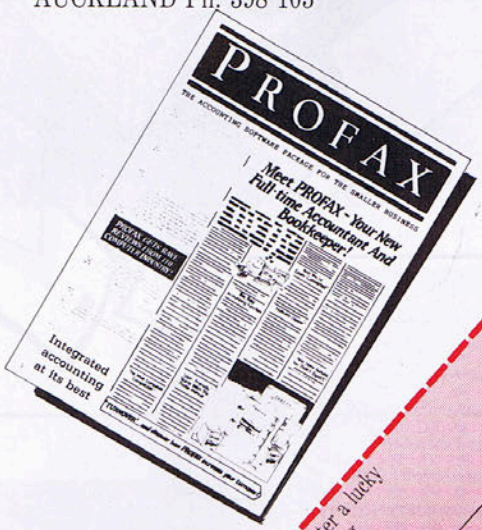
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