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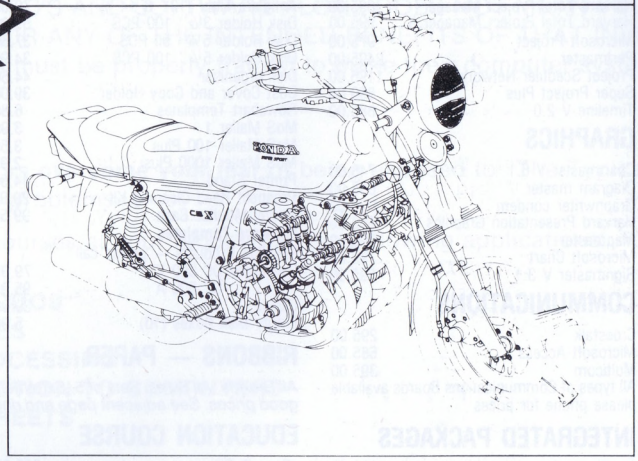

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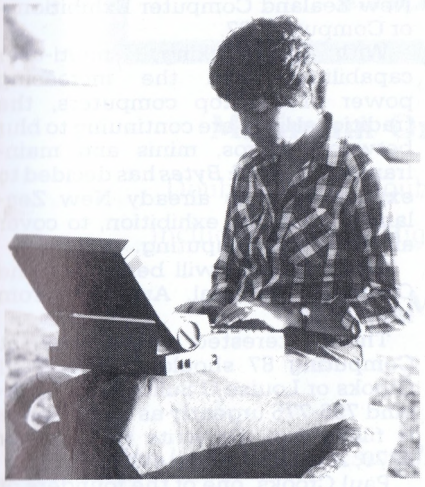

Cover review – the Wang LapTop portable p.35

COLUMNS

HARDWARE REVIEWS

SOFTWARE REVIEWS

FEATURES

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Paul Woods, manager of Verbatim New Zealand, presents a cheque for $5,000 to Beth Christoffersen, purchasing officer for Coopers and Lybrand and Associates. She won a draw after returning a coupon in a batch of Verbatim disks in the Christmas promotion, and intends using the money to buy a car.

It's tough at the top

In announcing its preliminary financial results for 1986, IBM has said it was "a difficult year". Worldwide nett earnings at $4,789 million were down 26.9 per cent on 1985, although gross income was up 2.4 per cent from the previous year's $50,056 million.

Contributing to the downtrend, according to IBM chairman John Akers, were sluggish capital spending in North America, moderating economic performance in some non-US countries, and what he described as "unsatisfactory levels of demand for parts of our product line."

Big Blue has cut back for 1987, otherwise known as "streamlining", by a combination of several methods. Staffing levels in the US have already been reduced by some 5,000, with a further 12,000 to go this year with an early retirement scheme and similar incentives in four other countries. Investment in plant and other property has been reduced by more than 20 per cent, and inventories by more than 10 per cent.

Such capital spending and other cost reductions will further be used this year, says Akers. "We will continue to sharpen our focus on customer needs, by dedicating more people to direct customer support and further enhancing our product line."

No sign of demand improvement in its worldwide business operation can be seen by IBM at the moment, and because the benefit of some cost and expense actions will not be apparent until the second half of 1987, the company believes it will be difficult to match last year's financial performance in the first quarter of this year.

Flag of convenience

The sale of some 50 IBM PCs to the accommodation group Flag Inns has been announced by Powercorp Group. These will supersede the dumb terminals used by about 30 New Zealand motor inns to connect with the reservations system Super Sally co-ordinated through the IBM System/38 mainframe in Melbourne, which have worked well but are proving expensive to operate.

Intelligent workstations, connected through the Post Office Pacnet system, were considered the obvious choice, with their added ability to run a front office accounting and booking system as well as the networked reservations. Flag Inns recommended Pericomp software and the IBM PC-JX as the base model, although some individual motor inns have opted for other models such as the PCG, XT and AT.

Flag Inns will be installing the machines and providing training and support for the motor inn owners, using its own personnel.

PC 87 now Computing 87

Reflecting trends within the computer industry, the Personal Computer Exhibition has been renamed the New Zealand Computer Exhibition – or Computing 87.

With networking, multi-user capabilities, and the increasing power of desktop computers, the traditional lines are continuing to blur between micros, minis and mainframes. So *Bits & Bytes* has decided to expand what is already New Zealand's computer exhibition, to cover all aspects of computing.

Computing 87 will be held at the Overseas Terminal, Auckland from May 28-30.

Those interested in exhibiting at Computing 87 should contact Paul Crooks or Louise O'Sullivan on Auckland 796-775 urgently as stand space is filling fast. Or write to P.O. Box 9870, Auckland for an exhibitor kit.

Paul Crooks, one of the founders of *Bits & Bytes* has returned from his OE to head the exhibitions unit. Other *Bits & Bytes* exhibitions this year are the Wellington Computer Show from July 9-11, and the Christchurch Computer Show from November 4-6.

Huge response

A near 20 per cent return rate made an overwhelming response to the readership survey in the December/January issue of *Bits & Bytes*. A wide cross-section of people was noted, predominantly male, with a fairly mature average age, and it was pleasing to see the number of over-60s using computers in business.

Another point was the number of people who use a small PC at home, but the opposite extreme at work.

Comments and suggestions made in the returned surveys will be noted, although it will take some time to analyse the data contained in all those forms. In the meantime, we are pleased to announce the six winners of the draw for storage bins and 30 double sided double density disks from Verbatim.

In alphabetical order they are:
Ian Ashley, Howick.
G. Franks, Christchurch.
Lala Frazer, Dunedin.
Geoff Jenkins, Waihi.
Mark Langsford, New Plymouth.
Craig Young, Palmerston North.

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Reflections abroad

by T. Mark James

I recently returned from a working holiday, spending two months in three countries and seeing a number of computer shows. These are some of my thoughts on what I saw and experienced.

Japan

In the northeastern part of Tokyo is a district called Akihabara, well known for its electronics bazaar. In the streets of Akihabara are tiny one-man shops and multi-storied department stores selling everything electrical, from car batteries to stereo systems, from individual transistors to full CAD workstations. You can wander around picking up various components and haggling over the prices; when you're ready to buy, you take the merchandise to the counter, where a polite young man will add up the bill and fill out the appropriate receipts – all by hand.

Yes, folks, you are in technocratic Japan Inc., the home of some of the most advanced computer equipment available. They make it, sell it, sometimes even buy it, but they never use it.

Go into one of Tokyo's mammoth banks to cash a traveller's cheque. I'm not talking about changing money: this cheque is already in yen and I just want some cash. I wait at the appropriate window while three clerks scribble various receipts and records. They hand me a token with the number 14 on it, and I sit down and wait until they call number 14 at another window, where they hand me my cash. The irony is that the bank has batteries of computer terminals with up-to-the-second information on exchange rates and interest rates, but no one seems to have thought of using them to automate the simplest of transactions.

Japan has a problem with the man/machine interface. The Japanese are just as frightened by computers as everyone else. The abacus is still the prevalent calculating machine, although Casio calculators are not far behind. The average Japanese sees a computer as a means whereby a higher authority provides instructions to and receives information from subordinates. There is little concept that the computer could help clerks or accountants get their work done faster or more accurately. The problem is partly keyboard input: few Japanese can type Western characters, and even fewer can type in Japanese. When someone invents an RS-232 abacus, things may change.

France

Four years ago France embarked upon a massive, government-sponsored videotex system called Teletel, with small, cheap terminals called Minitels intended virtually to replace telephones in many situations. Minitels were actually given away free in the city of Rennes during the introductory period of Teletel; the idea was to do away with the telephone book entirely. However, as soon as the introductory period was over and people were expected to pay for their Minitels, most people turned them in.

Teletel is successful because of business users, who can get business information from it, but in spite of great efforts on the part of the government (billboard advertising, on-line shopping, job search databases, even a pornography channel), ordinary people are not shelling out the francs for this gimmick.

United States

A similar phenomenon is occurring in the States. There are many videotex and ASCII dial-up bulletin boards and databases available, numbering in the thousands and dealing with everything from financial information to on-line flute concerto composition to right-wing political propaganda. The big national ones, like The Source and Tymnet, charge a per-minute connection fee and are successful if and only if they can appeal to a sizeable business clientele. The others are free or have low annual charges, and they flourish.

The free databases are not necessarily cheaper to use than the expensive ones. If, for example, you have a Sanyo 550 and want to participate in a dial-up discussion on that machine, the nearest bulletin board dealing with it might be in another state, and you pay long-distance telephone charges to use it. (The big commercial databases generally have access lines in most cities, avoiding this problem.) Nonetheless, people will gladly spend far more on telephone toll charges than they would for Tymnet fees. They don't object to spending money; they simply resent access fees.

BIX (the much-touted *Byte* magazine information exchange) falls into the same category as Tymnet: no-one uses it, other than hard-core Apple or IBM PC systems programmers, whose companies will pay. It's too expensive to be the cult object that *Byte's* hype pretends it to be. The high level of technical discussions in BIX's interactive conferences is nothing unique, either, except perhaps in the number of highly-placed people (Microsoft, Apple, Commodore) involved. Several programmers' magazines offer equally profound (and better edited) discussions: *PC Tech Journal, Programmer's Journal, Micro-Systems Journal.*

If you stick with cheap bulletin boards (and even a town like Birmingham, Alabama has dozens of these, telecommunicating is an inexpensive pastime. Most personal computers in America now have modems, and public-domain terminal emulation software is available for every conceivable type of computer.

Radio Shack sells a 300-baud modem for $US39.95, and Hayes compatibles (300/1200 baud, auto-dial, auto-answer) sell for $119 and falling. The latest Hayes modem has CCITT as well as American Bell protocols (CCITT is used in Europe and Australasia) and sells for $US549, but a Japanese company called Infotech already has something that sounds similar and is marked at $307, which means that you could probably buy it for $US250 or less in Akihabara.

Prices like this must soon appear in the States and in other countries where the postal-telephone monopoly is melting (England and Germany in particular), and when this happens, the electronic database village will indeed turn global. New Zealand is far behind the times on this scene – more on this later.

What's coming

One thing you miss in New Zealand is being in touch with the great rumour mills. You have to be in Silicon Valley to go to a party and meet an Apple project manager, or eavesdrop on people getting a senior DEC sales rep drunk and pumping her for rumours.

Apple is said to be working on two new open-architecture Macintoshes (that means Macs with slots for add-on cards), due for release sometime between March and June. They are the Mac ES (68000, one megabyte of RAM, and a single sixteen-bit slot) and the MAC II (68020, one megabyte, six or eight – depending on the rumour – 32-bit slots, and 32,768 colours). The slots are intended primarily for IBM compatibility; apparently Apple already has an 80286 coprocessor card in beta test in a Mac ES. It has a Phoenix AT BIOS, serial and parallel ports and a clock card. Stories of an 80386 co- processor abound. Imagine a Mac with both a 68020 and an 80386!

Ben Rosen, the enormously successful venture capitalist who was behind the likes of Lotus and Compaq, is said to be placing his bets this year on 80386 machines and software that uses protected mode is also

likely to get his ear. He's not the only one, either: Trends Consulting, a firm that is paid $20 million a year to predict fads and fashions among the moneyed yuppies, says that the 80386 will become a class item in 1987, along with denim formalwear, Caribbean cuisine and dark beer.

Some interesting new products have been released at recent trade shows. Computers in the mini range are now coming out as laptops. FirstMate makes portable PDP-11s with electroluminescent flip-top screens, starting at $US5000; rumours say there'll be a Micro-VAX soon. MegaTape has a streaming tape cassette that holds 630 Mb and looks (to the controller) like a Pertec nine-track tape. US Design has a 636 Mb (formatted) hard disk whose average access time is claimed to be 12 msec (it is based on SCSI; they have SCSI controllers available for both Q-bus and IBM PC). Everyone has laser disks, laser printers and desktop publishing software. Multi-user microcomputers are also the rage.

Other new products: East Coast Computer Systems has the closest thing I've yet seen to an MS-DOS shell running under UNIX. It's called Simul-Task, and runs only on the AT&T 6300 Plus (a PC/AT-type machine). Eutectic Electronics makes a three-dimensional vector graphics display system for IBM PCs or PDP-11s. The monitor weighs 18 kg and the processor six. Convex Compouter is now selling its C1-XP "micro-Cray" supercomputers, claimed to do up to 160 megaflops.

The latest fad in New York (predicted, they say, by Trends Consulting) is the "video dog". This is a hat-box-sized screen showing the image of a cute puppy. It responds to voice commands like "sit" and "beg" – the thing actually obeys. It is apparently a strictly New York phenomenon, like coloured popcorn; no one outside of the city has ever heard of it.

Back home

Freeways (sorry, motorways) may be the blood vessels of Los Angeles; cars, however, are not the lifeblood – they are the cocaine. A frazzled traffic jam on the Santa Ana Freeway one day, and driving on Auckland's laid-back Northern Motorway the next, provide the perfect summary as to why I live here now. Even apart from ANZUS and the America's Cup, New Zealand is a hot topic of conversation in the States. Many people asked about emigrating, while the word Chernobyl kept coming up. Some were even rooting for KZ7, and everyone I spoke to was embarrassed about Conner's sportsmanship.

Some comparisons, however, are less favourable. Let's talk New Zealand dollars for a moment. I bought a hair dryer for under 20 dollars ($US9.99), but try to find one here for less than 40. Retail markups rarely exceed 30 per cent in the States; here they are more like 100 per cent. This is a serious drag on New Zealand's participation in the computer age. Atari has an IBM-compatible PC for $US499; that's less than $NZ1000. Can you find one here, even from Taiwan, for even double that? Taxes account for 15 per cent of the markup. Who takes the rest?

Or modems: aside from the high prices, Post Office regulations limit the availability of modems, and thus ensure that most computers remain alone and unconnected. The official reason is fear that 220 deadly volts of mains current will somehow infect the telephone lines. Most modems I know live in computers and run on five and twelve volts DC. Why aren't they approved?

New Zealand has long suffered from an outflux of skilled computer people, salaries being cited as the main reason. I don't believe it. Now that the Australian economy is worse off than ours, why aren't the Kiwis coming back? If just one hardware importer decided to try to be a bit competitive in price, or if the Post Office decided to free up its lines a little, I'll bet they would come back.

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Education sale

In what Zenith Data Systems calls its first major education sale in the South Pacific, Auckland University electrical engineering students have placed an order with local distributors Warburton Franki for more than 80 Zenith PCs.

The Z-148 was the preferred unit after months of evaluation and negoatiation by the students for personal purchase and use in conjunction with their course. The base unit has twin floppy drives, 256Kb RAM, colour and monochrome graphics card and MS-DOS 3.1, but more than half the students will be taking delivery of Zeniths with more memory, hard disk drives, and high-resolution and colour screens.

The university's Department of Electrical Engineering currently has five Zenith PCs, with 17 additional enhanced units on order for a classroom set.

Takeover

Barson Computers Australasia, already owner of half the New Zealand Barson company, has acquired total ownership on buying out former directors Doug Pauling and Graham Bristow and their other organisation, Dragon Data Products. Barson thus joins the ranks of local computer companies which are wholly-owned subsidiaries of their Australian parents.

According to Greg Magness, Barson sales manager, the Australian company has already taken an active role in its subsidiary's operations. An early recommendation is to hire professional public relations assistance in the wake of adverse publicity resulting from a financial argument with Machinehead, a former dealer.

Theatrical grant

The restructuring of Auckland's Mercury Theatre, in the wake of Arts Council grants being withheld last year, has seen the computerisation of its accounting system. The chartered accounting firm Arthur Young recommended the use of CBA Business Package, and Cowan Bowman Associates donated the general ledger, payroll and accounts payable modules of the package, worth a total of nearly $4,000 and now running on Mercury's AWA Corona micro.

Non-recoverable floppy

Dear Sir,

I would like to take your reviewer, Mr Peter Biggs, to task over his review of the MACE+ utility program (Dec/Jan *Bits and Bytes*), specifically his remarks about the claimed ability of the program to recover accidentally re-formatted floppy disks.

His comments about formatting fixed or hard disks are substantially correct and agree with the PC-DOS 3.10 manual. Page 7-109, paragraphs 8 & 9, say that FORMAT determines the disk type, and if it is a hard disk, checks all locations within the DOS partition, but does not physically format them again. Thus the data is still in the sectors, and with suitable techniques is recoverable.

Formatting floppy disks is another matter. A FORMAT on a floppy disk, causes the computer to write track and sector information on every track of the disk, filling every sector with F6H bytes as it goes. These are then read back and checked, using the just-written track/sector information. Any error found by this means is taken to be due to a faulty disk. That area of the disk is 'locked out' by the appropriate codes in the File Allocation Table (FAT), and thereafter will not be used.

When a floppy disk is re-formatted, the same procedure is followed. All sector information is overwritten with F6H bytes, *and is irrevocably destroyed, rendering recovery impossible.* This can easily be verified by re-formatting an unwanted disk and then examining the sectors with Norton or Super-Utility or other disk utility program. Every sector except 0 will be found to be filled with F6s. (Sector 0 contains a 'Non-system Disk' message.)

Now, Mr Biggs says he was cowardly not testing MACE+ on his hard disk. He would have plenty of company there, including me. However, he claims to have re-formatted a floppy disk, and recovered the data thereon 'with ease'. Since this cannot be done,I am concerned that he has made a mistake, and a PC user with perhaps less experience could be trapped into losing valuable data or programs after reading Mr Biggs's review.

C.J. Donaghue,
Levin

Of course Mr Donaghue is correct. Formatting a floppy disk does destroy all data as it is overwritten with the F6H character. Somehow an error appeared in the MACE+ review and MACE+, or indeed any other utility, cannot retrieve data from a formatted floppy disk.

P. Biggs

PUZZLE: find the IBM man as Jim Centre of the Auckland office presents four new IBM typewriters to the Poutama Training Assistance Programme in Epsom, Auckland. Poutama runs a variety of training modules geared to Maori and Pacific Islander youth who need to develop skills which are considered 'marketable' by employers, and is assisted in its aims by the Labour Department, the Presbyterian Support Services Association and the wider business community.

ANSWER: Jim Centre's the fellow wearing the tie and dark suit.

Commodore shakeout

European news sources report puzzlement over the departure early last month, with a minimum of fuss and advance warning, of Nick Bessey, Commodore Electronics president and general manager. Commodore's UK and US offices refused to comment, only confirming the facts of his leaving.

Bessey's career with Commodore UK has been short and meteoric. After 12 years with IBM, he joined Commodore in April 1985 as general manager, and a year later switched to Commodore Electronics. Now, after scarcely another year he was moved again, and UK sources have been speculating on his return to the IBM fold, although there are suggestions that Atari UK might be headhunting.

But see the next item. How long will they take to trace him to New Zealand?

Recovering

Following a year of rationalisation and what it calls a "back to basics" philosophy, Powercorp Group has recorded a modest half-year profit of $208,000 to reverse the trend which saw a $2.6 million loss in the corresponding period last year. Sales of $9.1 million were less than the previous year's $13.2 million, reflecting the sale of six provincial branches, but the group reports the remaining branches in Auckland, Wellington and Christchurch are trading profitably.

And in a change of structure at the top, Powercorp's chairman and managing director, Dr M.B. Spencer, has relinquished his role of chief executive while remaining group chairman and heading research and development. The new managing director is Nick Bessey, formerly vice president of Commodore International and recognised as one of Europe's foremost computer executives.

More power to the lap

Launched internationally in mid-February was a new laptop from Compaq. Full details weren't available as we went to press, but Scott Green of Datatronic Systems cagily admitted to a few facts before the New Zealand announcement during the last week of the month.

"It addresses the market currently enjoyed by the Toshiba T2100 and T3100 types, being mains powered," he said. "It will have a fixed disk in minimum configuration and a capacity previously unseen in the laptop market, and will be the most powerful of its type, bar none, although it will not be a 386."

With a detachable keyboard after the style of the Sharp PC7000 and an enhanced gas plasma screen, the new Compaq is intended to give a "bit more flexibility in the desktop environment" than its competitors and the key objective is compatibility.

But in the light of supply problems with the Compaq 386 it remains to be seen what impact the new laptop will have in the local market.

Social welfare contract

Washington State's Department of Social and Health Services plans to save $US22 million a year as a result of buying a $US15 million computer and software package. Unisys Corporation has contracted to supply the equipment necessary to computerise the state's welfare system, a sophisticated on-line arrangement for determining the eligibility of beneficiaries.

The contract includes the supply of 1300 desktop workstations, an A10 large-scale mainframe and 13 A3 computers, as well as the Christchurch, New Zealand developed LINC II application system, a fourth generation generator which will enable the compilation of the social welfare software.

Singapore computer mart

Travellers to Singapore are always on the lookout for a well-priced bargain. Computer users are now well catered for. The Funan Shopping Complex, a modern large shopping centre located in North Bridge Road, has allocated the whole sixth floor to computer stores. Here some 100 different stores all compete to provide the shopper with a very special deal.

Naturally most of the stores have a large range if IBM clones and associated hardware, but a careful survey will expose IBM, Apple, Atari, Commodore and other well-known brands. Prices are very good, at least compared to NZ prices, and most stores will offer a mail-order service.

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The programmes have been carefully selected, tested and documented. They'll run on a wide variety of computers that accept 5¼" disks. We have tried to choose programmes as machine-independent as possible. However we cannot guarantee the suitability of programmes for your particular machine. Wherever possible we include source-code.

MS-DOS programmes are aimed at the IBM-PC and close compatibles. The NEC APC III will often require the software library extension card to be able to execute these programmes.

Documentation is included on the disks where required — often it is very extensive. Unfortunately, we are unable to provide telephone tutorials on using the programmes.

MS-DOS disks are formatted for standard MS-DOS 2.11 360K. Testing has been carried out for CP/M disks on a Z80 Kaypro II.

About 120 different formats are supported, including Kaypro, Osborne, Tandy, Microbee, Bondwell, Commodore 128, Televideo and Apple II.

MS/DOS

GAMES

M11: MONOPOLY NEW RELEASE. Now contains three versions of this popular board game. New addition is 109K.

M1020+: MORE GREAT TRIVIA. A two disk set which includes categories for science and nature, entertainment, sports and recreation, and general. $36.

M1021+: EAMAN ADVENTURES. A classic two disk set which not only provides sophisticated adventure games but also a menu driven facility to design your own games. Requires Basic. $36. They can grip your attention for hours.

M1023: GREAT BASIC GAMES. More than a dozen specially selected games written in Basic, including Wizard, Xwing, Combot, Mars, Racecar, CIA.

M1024: PHRASE CRAZE. An entertaining quiz-type games which asks you part of a phrase and requires you to complete it. Highly regarded.

M1025: AMULET OF YENDOR. Adventure with graphics. A Dutch programme with 20 levels of play against many monsters and powerful magic. You have choice of roles.

M1026: 5 TEXT ADVENTURE GAMES. Of different types, including a murder mystery, horror, pirate, etc.

M1027: SUPER HANGMAN. Highly acclaimed version that has larger vocabulary than most and includes quotations, riddles and music. Fascinating and educational.

M1028: SUPER COMPILED GAMES (3). Another excellent selection of compiled games ready to run. Includes Flightmare, Solitare, Jumpjoe and more.

M1029: LANDING PARTY. You select the crew (friends, movie stars, etc), which is stranded on a planet searching for energy crystals. The adventure confronts you with different situations and characters.

M1030: PROVOCATIVE PICTURES. A collection of hi-res digitized graphics, which are printed. These are naughty pin-ups and not suitable for or available to children.

M1031: WILLY THE WORM. This is a high quality game which allows you to build your own game board.

M1032: GREAT BASIC GAMES (3) AND ZORK UTILITY. A very entertaining selection including Boogers!, Fun, Rieman, Godcreat, Pirate, Temple and more.

M1033: SUPER COMPILED GAMES (4). A super collection of arcade-type games, including Astro, Chase, Crisis, Dilemma, Mazel, Q-Bert, and more.

M1034: TRIVIA GAME (3). The third in our popular series. This time questions are in the categories: TV shows, Science, Star Wars, Star Trek, Words, Astronomy, General.

M1035: MORE DUNGEONS, MORE DRAGONS. Good text-based descendant of the dungeons and dragons fantasy. Does not require graphics board.

M1036: MAHJONG. An outstanding Australian programme of the Chinese tile game with good graphics. It works with mono or colour. Can be addictive.

UTILITIES

M2021: UNIX COMMAND SHELL. Have you been wanting to control your programmes with commands similar to these available in Unix?

M2022: TSHELL-DOS MANAGEMENT. Provides an efficient environment for managing your operating system. Also has help screens.

M2023: BATCH LANGUAGE ENHANCEMENT. DOS's "batch" capability is similar to a language, with nouns and verbs to automatically combines (batch) and execute commands. This programme gives you more features and control when operating .BAT files.

M2024: CODE BREAKER. For those with an interest in deciphering codes/ciphers, this is a useful analytical aid.

M2025+: DOS EXTENSIONS: A two disk set of enhancements for the command of DOS. The first disk contains documentation; the second has the executable programmes. Two disks for $36.

M2026: CALTECH UTILITIES. A special collection which includes resident cut and paste, printer commands, pop-up tables, graphics characters, bad sector fix, hex file editor, directory utilities, ansisys replacement, echo replacement, and more.

M2027+: EXCEPTIONAL FILE & DOS UTILITIES. A two-disk collection of many powerful tools — such as fast format, alarm clock, disk wipe, display colour as shades of gray, file sorter, text reader, line counter, read squeezed library files, create files from memory, digital clock display, dos syntax reference, cursor speed-up, create secret directories, etc. $36.

M2028: ENHANCED CONSOLE DRIVER. Fansi Console offers many time saving and convenient features by controlling keyboard and screen. Create keyboard buffers, backscroll, keystroke macros, etc.

M2029: DART'S DOS UTILITIES. A special collection which includes file copy and move, file preview, sorted directories, file protection and more.

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M3017: PRINTING PREVIEW. Many word processors do not show you the end product on the screen — italics, bold, etc. This previewer lets you see what you'll be getting before you print.

M3018: DIAGRAMME AND TEXT EDITOR. If your needs combine text with simple diagrammes then this editor is for you. It takes special advantage of full-screen control.

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LANGUAGES

(For tutorials, see Education Section)

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M5021: SCREEN GENERATOR: PC-Input is a new aid for designing screens in Basic. Has lots of nice features that help you improve the screen appearance of your programmes.

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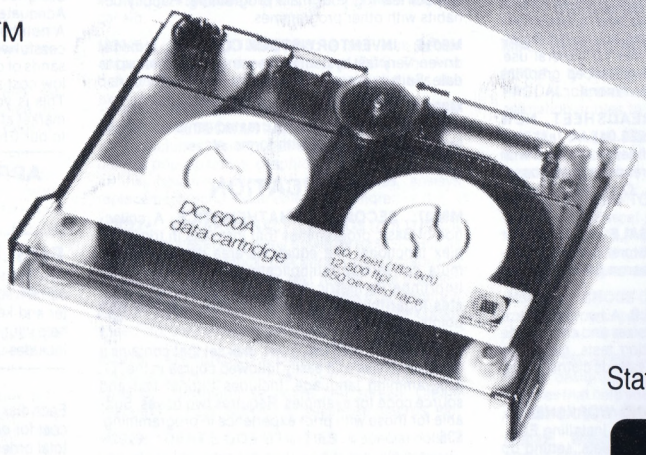

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Reluctant returns

by Larry Elliott

In the December-January issue of *Bits & Bytes* two new modems from CompuSpec, a local manufacturer specializing in computer communication products, were announced. These have now been released, and are part of a new range of modems that will be introduced over the next few months.

The M50 is a V21,V23 model (300-300, 1200-75) with Auto Answer, and is listed at $499.00. The circuitry is based upon the now standard AMD 7910 chip, often known as the world chip. The case design allows for an NZPO telephone to sit on top, thereby not requiring any additional desk space. A very worthwhile feature in my book!

The front panel contains LED indicators for each mode of operation as well as indicators for Phone/Data, On-Line, Carrier Detect, Receive Data and Transmit Data. Rather than several mode selector switches, a single switch is used to step through the various modes. Interestingly, this switch is only operative when the phone/data switch is set to phone.

For regular use the M50 can be preset to "wake up" in a specific mode, set by dip switches inside the unit. The factory default settings are: 300 BPS originate, non auto answer. When set to auto answer the LED of the selected mode flashes at approximately 1 pulse per second.

The rear panel houses the RS232 serial port, the line interface cable, the BT socket for the extension phone and the cable for the remote power supply. The M50 is microprocessor controlled which allows for power-on testing.

Setting up and using this modem was completely trouble-free. Either a full RS232 cable or a simple three-wire system can be used, the modem detecting which is connected and making adjustments accordingly. If a full RS232 cable is utilized in conjunction with a "smart" communications program, auto hang up of calls can be accomplished, a useful function for those using the Packet Switch Network where charges are determined by the length of connection.

I was delighted with this product. Not only was it an example of good technical design, but it also functioned extremely well. I had only one minor criticism of the M50: I would have preferred a longer line interface cable. However, I must quickly add that I was testing this unit at home rather than in the office environment where the telephone outlet would be located close to the desk. Anyway, telephone extension cables are readily available nowadays. Careful thought to other than just the technical requirements makes this an excellent product.

M50, with telephone attached

M1200

The other unit released is the M1200, a V22 (1200-1200) intelligent modem. This unit can be operated manually from the front panel or completely under software control using the standard Hayes control codes, and is able to recognise what parity the local computer is using and configures itself accordingly. It can operate in an auto dial mode using either pulse or tone dialling, and is also capable of auto answer.

By utilising the Hayes command codes the M1200 is capable of supporting almost all of the communication packages available on the market. I tested it with PC Talk, Procomm and Crosstalk. All performed faultlessly. The ability to utilise some of the automated operation features of these packages for the first time really whetted my appetite for such a unit.

The unit supplied for review was a pre-production model and some refinements had not been implemented. For example, the production models come with a loudspeaker, which enables monitoring of the phone line prior to instructing the modem to dial out. Not having this facility did cause some consternation on a couple of occasions when I decided to dial out while someone was using the telephone. Other than that it was a delight to use, and it was a very reluctant reviewer who returned the sample.

With a recommended list price of $1,195.00 the M1200 is competitively priced, but it is not cheap! But given the fact that four times the information can be exchanged than is possible with a 300 BPS unit over the same duration, the resultant savings in time charges will very quickly account for the intitial capital outlay, especially if the majority of your calls are on the international Pacnet as most of mine are.

Another useful application for the M1200 is that of an auto dialler for the telephone. Many of the utility programs available incorporate an auto dialler section, and although none of these were specifically tested there is no reason to believe they wouldn't work with the M1200. Users of Sidekick, from Borland, should note that this program is pre-configured for Bell 300 BPS dialling protocol and will not work as standard with a M1200. A software patch is available which will make Sidekick compatible.

The manual for the M1200 is very comprehensive, detailing all of the program commands and result codes together with instructions for changing registers should a specialized requirement be needed. It should be noted that for normal usage a software package, which supports all of the Hayes commands, and an RS232 cable are all that is required to get the M12090 up and running.

Both of these modems conform the NZPO Specifications CSA5001, CSA5002, CSA5003 and CSA5004, with the M50 also conforming to CSA2008. They will automatically release the line in the event of a power failure, upon the loss of an incoming carrier, or if no carrier is detected from the answering modem within 30 seconds of dialling.

Compuspec deserves to be congratulated on these two very fine products, having chosen to develop them here in New Zealand rather than import from SE Asia and coming up with two excellent units. Functional design and superb technical performance would ensure that the M50 and M1200 could hold their own against any imported product.

Review units supplied by CompuSpec, Auckland.

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A sense of balance

by Tony Sanders

Every Monday morning at a time when few of us are actually able to handle more than the most easy of listening music, Jim Higgins (President of the New Zealand Computer Society) finds himself on the National Radio *Good Morning New Zealand* programme in conversation with Maggie Barry. This five-minute broadcast is beautifully understated and precisely structured. It is, and the pun is quite intentional, a model programme.

I remember particularly one broadcast late in 1986 in which Mr Higgins tried to put into perspective the speed at which a PC microprocessor works. An average present-day personal computer microchip processes about 24,000 instructions per second. If this was slowed down to one instruction per second, said Mr Higgins, then an attached printer would print at a speed of one character every 24 hours.

This, of course, can by no means be described as heady stuff. Its very lack of breathless enthusiasm is reassuring to the computer novice who is, after all, the target audience. The more experienced of us could do worse than go out of our way to listen every Monday morning as well, not so much to get things into perspective as to retain a sense of porportion.

A sense of proportion is especially important to those on both sides of the software review fence. The December/January issue of *Bits & Bytes* carried an article by Dennis Lally in which he reviewed Direct Access, a menu utility programme, and a product which he was quite breathlessly enthusiastic about. I read the review several times over the Christmas period and, although I already had a perfectly adequate menu system on my machine, went out and bought a copy as soon as my bank balance had recovered from the festive season.

As with so many installation processes on machines with non-standard configurations (my Sanyo 885 has two floppy drives installed, a 20 Mb hard disk and is toggled for up to two ramdisks), the installation procedure fell flat on its face, twice! I resorted to copying the files one by one to the appropriate sub-directory, amended my autoexec file, and rebooted. A good thing I wasn't a novice!

The menu system I was already using is called Automenu (PC-Sig software, supplied by Remarkable Enterprises Ltd), a low budget program to which Direct Access bears an uncanny resemblance. Automenu also has a screen blanking routine, supports sub-menus and displays the time and date, has a similar screen layout, and loads programs with a single key stroke.

Direct Access is certainly an improvement over the low-cost ($35) Automenu: it takes up only half as much memory, is more flexible and provides far more features... but perhaps we should question whether it is really $200 better. Especially, for example, when a powerful, fully-featured and reliable hard-disk management programme like Q-Dos (Gazelle Systems) can be bought for around $100.

Value is, of course, a subjective thing. Any product that protects the inexperienced from the standard MS-DOS interface and the possibility of making those input errors that so often lead to the novice concluding that he or she will never understand computers, is of great value to the industry as a whole, let alone the end user. That is why it is important that the cost of making MS-DOS what it should have been in the first place be kept as low as possible.

Direct Access is a very good program, but not a great one. This far down the PC software development track it really should be a much better product. If the copyright notice is anything to go by, it has been around since 1984, which means it is well overdue for upgrading anyway. It is glossily packed, but then so is toothpaste these days.

The manual is adequate, although it doesn't so much as document one feature of menu maintenance (F3,Move) as mention it in passing, which is just as well as with my copy it doesn't work.

Make no mistake, Dennis Lally in his software review did me, and no doubt many others, a service. He told me about a product that I had already heard about but thought I didn't need. But my sense of proportion tells me that it isn't the inexperienced that I wish to shield from the hostility of MS-DOS, so much as myself.

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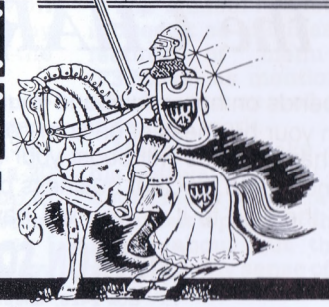


Two new DTP products

Just released by Hewlett Packard are two new products aimed at the desktop publishing market. The Scanjet scanner, a flatbed desktop machine, will electronically scan printed images from a variety of documents, making electronic copies to be stored on a hard disk and used directly by some of the currently-available PC compatible DTP programs.

Selection resolution can be anything between 38 and 300 dpi, with image size reduced to as little as 13 per cent or enlarged up to 1578 per cent, depending on the selected resolution. The HP Scanjet can distinguish 16 different levels of grey, and supports three image-data types: binary, for line art and straight text; dithering, similar to halftone reproduction used by newspapers; and 4-bit grey scale allowing scanning to edit the image before conversion to a dithering pattern for printing.

The Laserjet Series II, described by HP as the next generation of desktop laser printers, is an eight page/minute unit based on the Canon LBP-SX engine, with expandable memory (from standard 512 Kb to a total of 4.5 Mb) and two font cartridge slots to enable two users to use different fonts in a shared environment. It also has a 200-sheet input bin and 100-page correct-order output bin.

Distribution agreement

Tech Pacific, the Australian computer product distributor, has announced a multi-million dollar agreement with the Nevada firm of Migent International Corporation, giving exclusive rights to the distribution of Migent's range of software and peripherals in Australia and New Zealand.

According to Tech Pacific's managing director, Jim Kennedy, the first product to be marketed will be Ability, Migent's multifunction package with word processing, spreadsheet, relational database, professional business graphics, communications and presentation graphics.

If its news. . . . . call John King, Ph: 796-775

Kiwis win in Fremantle!

Trying hard to make a local hedge resemble an exotic West Australian seascape are Tim Manning, Managing director of MoS, and Sue-Anne Hall, international business manager of Lotus Corporation, with the Lotus Dealer of the Year award.

It's become a well-worn phrase, perhaps, but not only yachting has been keeping the local interest high on the far side of Australia. Another excuse for a jolly January outing was the NZ Dealer of the Year awards sponsored by such leading software companies as Lotus, Micropro, Ansa and AST, and recognising commitment and effort in promoting the product range as well as sheer volume sales.

The ceremony took place aboard the *Captain's Lady* off the coast at Fremantle, and Mailorder Systems took two separate manufacturers' Dealer of the Year awards. "We're proud to receive these awards and delighted that the American manufacturers can appreciate the efforts made here in New Zealand," said Tim Manning, MoS managing director.

Enhanced convertible, new mainframe

IBM last month unveiled new products designed to enhance the slow-selling PC Convertible. Included are a 256Kb card to bring memory up to 640Kb, a Hayes-compatible internal modem, and a new supertwist LCD display screen. Many analysts suggest that the move by Big Blue is a direct result of the success Japanese laptops, particularly the high-flying Toshibas, are having on the marketplace.

The PC Convertible, for the most part, has been a case of too little, too late. For example, the original builtin modem for the Convertible was not compatible with the Hayes, meaning most of the good communications software developed for the Hayes wouldn't work.

Big Blue last week also announced a new top-end mainframe– the 3090 Model 600E, with up to 60 per cent more computing power than its previous high-end machine. IBM will also start producing a new one megabit chip to support the new mainframe, to be made at IBM's Essex Junction, Vermont, plant.

C version of PSimulator

Version 3.00 of MicroSim's PSpice analog electrical circuit simulator has been converted from Fortran into C, resulting in a reduction in program size, more compact datastructures, and a doubling of maximum circuit size. Execution times are said to be improved over earlier versions.

Monte Carlo analysis is also available as an option for PSpice, allowing component values and device model parameters to be given device or lot tolerances.

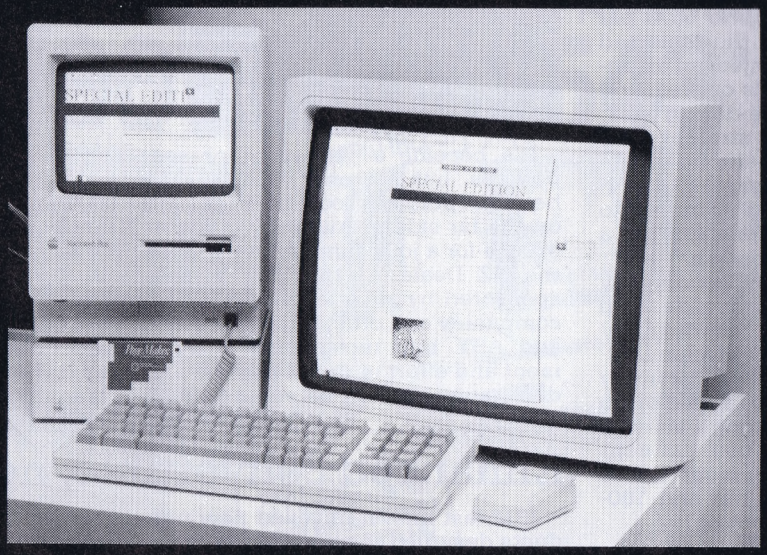
Architectural update

Autodesk has announced that it will begin deliveries of version 2.5K of AutoCAD AEC Architectural, containing user-requested additions and correcting all known errors. Among other things, it will now be possible to insert doors and windows in walls thicker than 30cm, said to be an improvement over the previous version.

Version 2.5K will be sent free of charge to all registered users.

Macintosh Plus Users –

Open your eyes . . . and see what you've been missing!



MEGASCREEN Monitor for the Macintosh Plus –

The 19" monitor fully supports the Macintosh environment, allowing you to increase your workspace by more than five times. Compatible with off-the-shelf software, MegaScreen further enhances all the performance and capability of the Macintosh Plus as a Professional Desktop System.

Enhance your Publishing Performance

The ability to compose and edit full page documents at high-resolution supports your creativity. MegaScreen helps you meet deadlines, cutting time required to produce printed matter by as much as 50%.

Broaden your Design Horizons

Visualize your concepts at full size without window cropping. MegaScreen eliminates time-consuming zooming and scrolling to hidden parts of your drawing.

MegaScreen Product Specifications:

MegaScreen components are housed inside the Macintosh Plus. Cabling to the 19" diagonal external monitor is passed through the securty port on the Macintosh Plus case back. MegaScreen is not a user-installable product, and must be installed by an authorized dealership technician.

MegaScreen Monitor Specifications:

Resolution:	1024 x 900
Refresh Rate:	58 Hz
Phosphor:	P-4
Screen Size:	19"
Size:	Width 18", Height 14", Depth 15"
Weight:	40 lbs
Shipping Weight:	45 lbs

Sole New Zealand Distributor –

Delairco Electronics Limited

Auckland
111 Franklin Road
Freemans Bay
Auckland
Fax: (09) 789 328
Telex NZ 21640 (Delarco)
Ph: (09) 788-798

Wellington
27 Kings Crescent
Lower Hutt
Wellington
Fax: (04) 694 680
Ph: (04) 693-166

Registered Apple Dealers

Export award

Major export awards announced recently by the Minister of Overseas Trade, Mike Moore, were won by Paxus Information Services Group, of Auckland, and the Christchurch manufacturing company Resinart Plastics.

Paxus won the New Zealand Added Value Export Award for its Charter business software, described by Mr Moore as "probably the most successful microcomputer software exported from New Zealand". More than 5,000 companies and individuals have bought Charter, with more than $4.5 million worth going overseas.

Amstrad edges out IBM

Amstrad's market dominance in the UK continues apace. With the acquisition of the Spectrum range of computers last year, the company's market share of the UK home computer business is around 60 per cent. This success was mirrored in the PC market during December when, for the first time, Amstrad achieved a 26 per cent slice of the dealer PC market, pipping IBM into second place with its 25 per cent market share.

The market research backing up Amstrad's claim to PC fame was carried out by Romtec, a leading London-based MR firm quoted as saying that the December figures will have been surpassed by now.

IBM executives won't be shedding too many tears, however, as the bulk of the money-making PC deals are made via direct contract channels, leaving their dealer network to mop up the crumbs.

Short supply

The initial promise of the Conpaq 386, the first to take advantage of the Intel 80386 32-bit chip, has not yet been matched by deliveries in numbers to match demand.

The reason is twofold,according to Scott Green, marketing manager for the NZ distributors, Datatronic Systems. Stock has been difficult to obtain from Australia because of a customs work-to-rule in Sydney, which has also affected other products, and an unforeseen demand for the 130Mb hard disk version has led to initial shortages of that model, although he reports the 40 and 70Mb 386s as having no problems.

Compounding the situation was the fact that Compaq Computers Australia has been in the process of shifting its warehouse base at the same time.

Find the spike

An alternative to installing equipment to protect computers and peripherals against spikes in the power supply is to identify those unwelcome high-voltage pulses at source. Vickery Electrical Ltd of Wellington has available a British test set and recorder made especially for the job, and also offers the more common grounded mains interference suppressors for protection when spikes do occur.

Pedigree technology

Bloodline, a database with information on half a million thoroughbred racehorses on both sides of the Tasman Sea, has been set up by Michael Sissian. Subscribers with PCs can access the database, located on two ICL 2966s in Sydney, by data links, and also have access to information in Northern Hemisphere countries.

The basis of the bloodstock database is the Dalgety system of computerisation of catalogues, still not completed after seven years' work but now reconstructed to meet the specific needs of breeders, trainers and buyers. Breeding information is continually updated with race results for current pedigrees.

United industry body

The Information Technology Association of New Zealand (ITANZ), a united computer industry group, has been formed by a merger of the Computer and Office Products Industry Federation (COPIF) and the Computing Services Association (CSA). Initial president is Gordon Hogg, former president of CSA and chief executive of Databank Systems, who will be succeeded in July by Trevor Eagle, chief executive of the Auckland-based Eagle Technology.

COPIF formerly represented mainly overseas interests and CSA local industry, and ITANZ is seen by Hogg as opening up new opportunities for special partnerships between overseas computer suppliers and the local industry. "For the first time, we have an opportunity to push the development of information technology with a truly united front."

Technology joint venture

Emtall Information Systems has been formed in Wellington as a joint venture between Crown International, the export and marketing arm of Crown Corporation, its equity investment and business development arm Crown Ventures, and the Wellington-based information technologies company Emtall Group.

According to Noel Bates, Emtall Information Systems chairman, "The new company will specialise in providing innovative and practical technology solutions to clients, with a primary focus on the horticultural and rural servicing industries. Several large-scale software packages in this area have already been designed and will not only improve the performance of the horticulture sector clients in New Zealand, but will also be marketable overseas."

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A128 Creditors/General Ledger (Integrated Creditors, General Ledger – available March 1987)	$599 & GST
A128 Real Estate Prospecting Suite (Real Estate agents selling aid. **Requires SUPERSCRIPT 128)**	$599 & GST
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Clip-on DOS – the Sidecar for the Amiga

by Peter Biggs

If you are an Amiga owner and are envious of the software that runs on your friend's cheap IBM clone then look no further... Commodore has released its Sidecar here in New Zealand and it runs IBM PC programs. However, there are some inevitable odd limitations in function, but for Amiga addicts they should not prove a problem. For others, think carefully about what you want.

I come from using a 20Mb 8MHz IBM compatible using EGA colour, so when I was contacted regarding reviewing Sidecar I was interested. I had seen an Amiga only at a distance.

Sidecar comes in one box and consists of a unit 27cm wide, 38cm deep and about 14cm high, coloured the Amiga colour. It has a single 5.25 inch floppy disk drive.

The disks supplied are the Amiga 3.5 inch Workbench v 1.2 and Kickstart v 1.2 disks, and a 5.25 inch MS-DOS system disk with two MS-DOS tutorial disks. The manuals are the 40-page Sidecar User Manual (not indexed) and a 200-page DOS manual (indexed). The Sidecar supplied has a version number 1060.

Taking the cover off Sidecar to look inside requires removing four screws. However, if it has been installed then the units will need to be detached first because two of the screws are inaccessible when the units are assembled. I found this irritating. Inside is a fan, three 'long' slots, dip switches and a socket for an 8087 coprocessor.

The only external port from the Sidecar is an external disk drive connection. Either another 5.25 inch drive or a 3.5 inch drive can be attached, the 3.5 inch drive holding the standard 720Kb. The Amiga 3.5 inch drive does not act as drive B but Commodore is attempting to change this in future. To provide hard disk capacity either an internal hardcard or an external hard drive can be fitted.

Cards

Cards that can be fitted inside are a monochrome, AGA, parallel and RAM memory cards. The configuration I reviewed used the Amiga for its video handling. Although it can be configured for either monochrome (white on black) or colour, the resolution for both is CGA in both cases. I did not test a monochrome or AGA card. The standard bootup configuration is for monochrome, but this can be altered with internal dip switches.

The monochrome card is fully compatible with standard PC video cards and supports all standard video attributes. The advanced graphics adapter (AGA) card is a special video card which combines IBM colour graphics, IBM monochrome and printer facilities, Hercules, and Plantronics ColorPlus (an EGA display card). It can display 132 characters in monochrome as well as 640 x 200 pixel graphics in 16 colours. The bad news is that to switch the AGA card between monochrome (including Hercules) and colour requires dismantling the system and setting internal dip switches. Also, blinking of text is not supported by Sidecar.

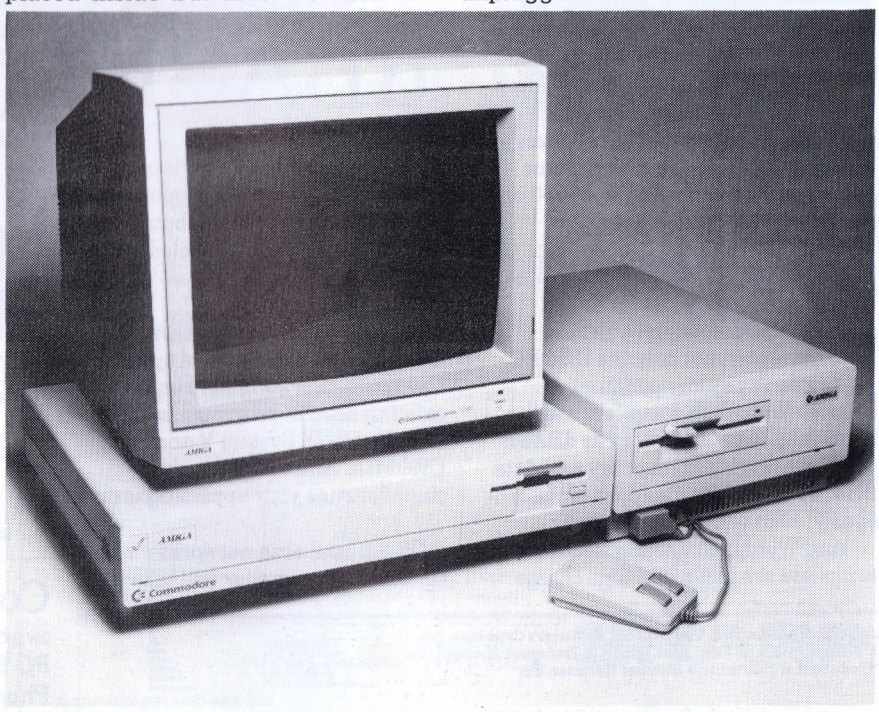
A parallel interface card can be placed inside but must be used as LPT2 (Printer 2) because the RAM addresses used by LPT1 (Printer 1) are used up in the expansion port. A serial interface card can be added but must be set to COM1 because COM2 is used up in the expansion.

Standard RAM is 256Kb, but more can be installed on the main board up to 512Kb. To get 640Kb a RAM expansion card must be installed.

Installing it is fun. The manual is brief and circuitous, but in hindsight it is all there. The manual is too wordy in many places and a few well-placed diagrams would be appreciated. Some screen dumps would also be useful.

The keyboard does not have the keys Num Lock, Scroll Lock, Prt Scr/* or + on the keypad. The emulation of these is achieved with control sequences using the right Amiga key and N, S (or HELP), P, and + respectively. This is essential for the Pg Up, Pg Dn, Home, End, etc, keys. Yes, the Ctrl-Alt-Del key combination will reboot DOS.

Sidecar is attached to the expansion port on the right-hand side of the Amiga. I removed this cover and unplugged the mouse. I sat the



Sidecar beside the Amiga and slid the Sidecar expansion port into the Amiga port. I then plugged the power supply from the Amiga into the Sidecar and plugged a power cable from the Sidecar into Amiga power supply. The mouse was then plugged into a front port on the Sidecar.

All this makes the Amiga immovable. Any upward movement of the combination would damage the expansion ports. The unit extends 5cm behind the back of the Amiga and sits 3cm higher than the top of the Amiga box. It looks cumbersome next to the sleekness of the Amiga.

Vital action

I switched on the Amiga first then switched on Sidecar. This step is vital as the Amiga can be damaged if Sidecar is switched on first. I taped down the ON switch on the Amiga!!

I placed the DOS system disk in the Sidecar drive and closed the door. Inserting the Kickstart disk booted up the Amiga and inserting the Workshop disk started the rest. From then on it was mouse time. I discovered that I needed to open the Workshop icon and 'point and click' to the PC colour option.

The screen blanked and then I typed in <Return> MODE C080 <Return> blind – that is, no letters were echoed on the screen but – lo and behold – the prompt A> appeared.

At this point I thankfully abandoned the mouse and proceeded to test everything I had. The result – Sidecar works and it will run all software, but with some potential problems as outlined below.

Pull-down menus are available while DOS is running. These change the configuration of a number of items.

PROJECT MENU enables colour setings to be Saved or default colours to be restored, some brief information and to close the window. DISPLAY WINDOW will enable the DOS display to take up the full size (80 column by 25 lines) or a smaller size, show/hide the border, select colours, set the cursor blink rate, redraw the display, select the depth of text display in 2-16 colours, set the display task priority and toggle the interface.

The manual is brief and circuitous, but in hind sight it is all there.

However, it is slow!!! Sidecar runs at the standard 4.77 MHz (why not 8 Yes, I could get it to run two PC applications, as long as they were both on the same disk.

That's the plus side. If you need to run MS/PC-DOS software you can make it work.

On the negative side there are a few inevitable glitches.

One. When it is acting as a PC compatible it is not an Amiga so that Amiga and PC/MS-DOS programs cannot always be run concurrently. This is because AmigaDOS 1.1 will not allow for the extra 30-40Kb required by the Sidecar system. Amiga software that has been written for AmigaDOS 1.2 is required or else an error message occurs. This is fatal and the system needs to be switched off and rebooted.

Two. There may be some printer problems. Only some software can use a parallel printer attached to the Amiga itself. For example 'PrtSc' will not work reliably and other printing functions may not operate well. Trial and error is required for any given software.

Three. PC monochrome text appears in 4 colours and PC colour text can appear in up to 16 colours. The more text colours that are used then the longer it takes to refresh the screen. This usually should not be a problem.

Four. When the PC display is

changing a lot, the Sidecar display emulator will consume a lot of the Amiga system resources. If the display priority runs at a lower priority than other tasks in the Amiga then the display is rendered uneven. If the display priority is too high, other tasks will be held up. This priority can be changed from within DOS. Again, only trial and error with a given program can resolve this.

Summary

What is it like to work with? In a word... adequate.

Yes, it runs DOS programs more or less satisfactorily and Commodore is to be congratulated for mating an elephant with a jaguar. I would only ask, was it worth it? Obviously Commodore, aware of the possible market vacuum of Amiga software, had to make DOS software available on the Amiga. It has taken almost five years of software development to begin to take full advantage of the 8088 chip, and the 80286 chip on the AT has hardly been touched. Data interchange software is still being written by Commodore.

Research on user-friendly computer interfaces was done by Xerox at its Palo Alto labs in the late 1960s and 1970s and the mouse, pull-down menus and graphic icons all came out of these labs. The Macintosh, Amiga, Atari ST and Microsoft Windows all owe a debt to this seminal work. It is probably the future for computers, and the Amiga performs best in this graphics-intensive stuff and does its own thing best. When mated with the restrictions of hardware that reflect what was happening at least eight years ago, then it degrades its potential performance.

Pull-down menus are available while DOS is running

For the cost of Sidecar one can buy a dual disk drive, (admittedly) monochrome standard PC with eight slots and full keyboard printer/video capability. The Sidecar could only appeal to someone who wanted some of the Amiga functions, wanted to save deskspace, but lacked the software required. Also, PC software really requires two disk drives to be reasonably functional, so an extra drive would need to be purchased. I am told by Commodore that a 20Mb hard disk can be partitioned for AmigaDOS and MS-DOS, thus giving the Amiga owner hard disk access.

My advice to an Amiga owner would be to decide which tasks you want and to buy Amiga software for that purpose. If you want PC compatibility then buy an IBM PC compatible. Transferring data can then be done with a good comms program such as PC-Talk and an RS232 interface.

A comment on the Amiga itself. I found the copious disk swapping on the single disk drive quite unacceptable. Who knows, one day Commodore might do it properly and release a computer with truly adequate disk storage first time up. After all, it is 1987, not 1977.

System supplied by Commodore Computer (NZ) Ltd, Takapuna.

Costs: (including GST)

Amiga $4295
Sidecar $1995
Amiga and Sidecar purchased together $5895
Upgrade to 640K RAM $400
20 Mb Hardcard BASF Brand $2385
5.25 inch floppy drive $350 approx.
3.5 inch floppy drive $795
Total: Amiga plus 640K 20 Mb Sidecar $8680 Retail
Value for money: It depends on what you want.
Documentation: Sidecar 5/10
DOS 8/10

Rupert Murdoch's first computer company

A subsidiary of The News Corporation Ltd, parent of all Rupert Murdoch enterprises, has acquired a controlling interest in Comsell Inc., an Atlanta-based publisher of interactive video catalogues and training courses. Comsell had been handling projects for 20 Murdoch magazines, including *New York, Elle* and *New Woman* for about a year.

The acquiring subsidiary is called Murdoch Magazines, headed by John B. Evans, a former publisher of *Village voice*. Both firms are private, and no financial terms were released.

NZCES Conference 1987

The conference of the New Zealand Computer Education Society will be held in Christchurch from August 30 to September 2. Apart from the usual fare of papers and workshops the programme features five overseas speakers including experts on Domesday systems and Logo programming. More particulars are available from the conference secretary, Ross Polsen, 49a Good St, Rangiora.

Details on the overseas speakers will appear in a future issue.

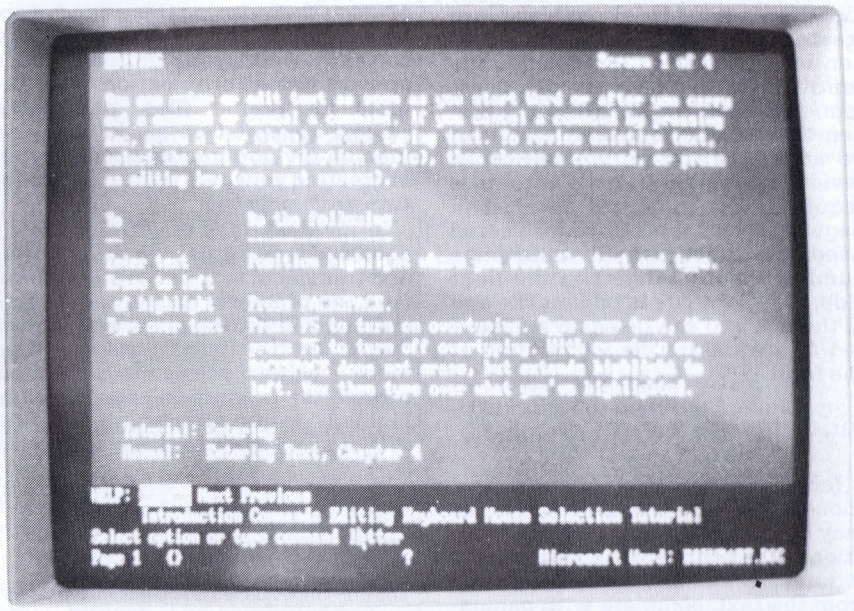
Domesday evaluation

At the Australia-New Zealand Association for the Advancement of Science Congress in Palmerston North in January the New Zealand Geographical Society announced support for a working group to evaluate the geographic potential of Domesday System Technology. The group is assessing the Domesday system itself, its potential for geographic education and research, its development potential and its implications in a New Zealand context.

The group's members will work on assessing different aspects of the system and will hold a symposium on the topic later in 1987. Anyone interested in keeping in touch with its progress should contact the convenor, Dr Pip Forer, Department of Geography, Canterbury University, Private Bag, Christchurch.

Total flexibility

by Peter Taylor, ANZIM

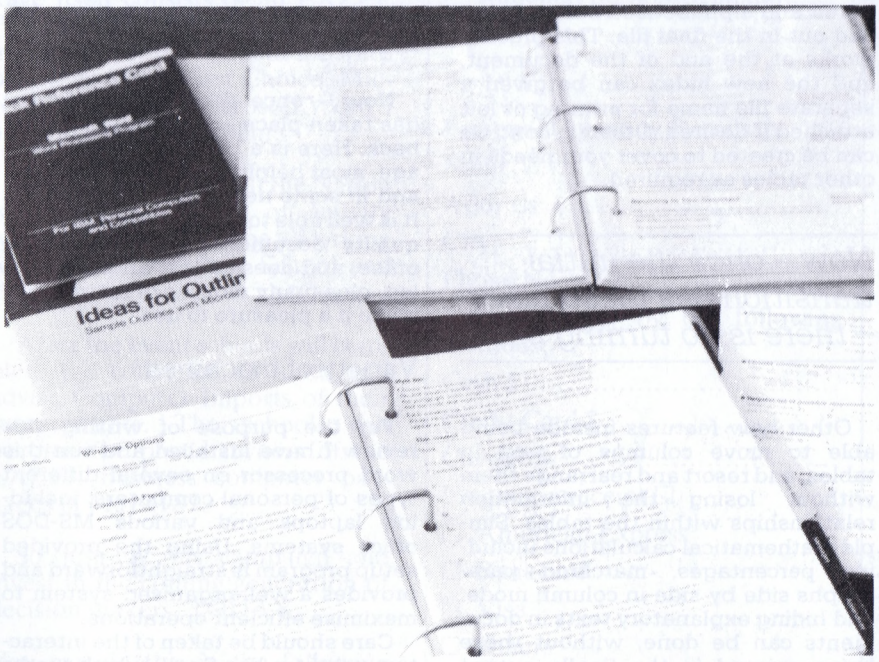


Microsoft Corporation has really moved forward in the market place with its latest international edition of Microsoft WORD 3. This word processor offers outstanding new features together with a significant group of further enhancements and a faster system operating them all.

Imagine – just listing the key points of your letter/article on the screen, popping into outline mode and adding subsidiary points to these and then proceeding to add the text under each. However familiar this may seem to your normal method, what you can do now is very different. Perhaps you need to check those main points again; just a quick key stroke and there they are, without all the text. Should you wish to change the order of things, no complicated delete and insert (or cut and paste); just grab a heading and it will take all the subheadings and text with it, and if you are using any style of numbering, will automaticaly renumber in the new situation.

Outlining provides a new strategy to approach your creative work, and supports a useful range of helpful features to further enhance this activity. When in this mode, simply Shift/F5 between text edit and outline edit, and see the difference.

There are many variations of this type of operation available in Word 3 which can save so much keyboard time and allow easier construction in most complex documents, including the legal kinds as well. Using the powerful features of the glossary does allow so many standard forms, texts and statements to be imported and quickly modified at the work face. Again the various style controls are available to produce different layouts throughout documents or during setting up. Total flexibility is the user's experience with this package over the widest range of word processing requirements.



Upgrades

My having come into the word processing scene through PC Write, Wordstar, and then Word 1 for MS-DOS and Apple Macintosh, has helped me appreciate the upgrades offered during the past two years. Menu-driven word processors, correctly integrated with their operating systems and hardware, can produce some outstanding work indeed. With the current high-quality dot matrix printers, complete with bins (three) all controlled by this program, we have an excellent tool fit for any office situation, as well as supporting the professional in various activities away from the office. An example is the merge facility which allows complex document preparation for individual postings plus envelope typing too, in the same operation.

With the development of the use of screen Windows, Microsoft has included some very helpful features here. Windowing does make it so much easier to share the screen, and see notes, outlines and other parts of the document or other files, or import text or make more notes in the corner, all without leaving the program. Convenience is yours, being able to have the screen cover a number of areas, opening and closing these at will.

Mouse controls can be used in many areas and often speed up the actions through built-in shortcuts. A few simple Control and Alt commands will open up the extra facilities.

The Contents and other suchlike tables you may wish to construct, together with Index tables, are created by a new feature using hidden text. Similar to the C language control method used in the UNIX system, these are the .c. indicators hidden throughout your text. They can be added as you go or later on in review mode. When your Contents is required, the program lists, then paginates, and sets out your selected headings, together with their page numbers neatly ranged on the right side. The Contents is built at the end of the file, and can be easily transferred to a separate file for printing at the front.

Indexing

Index creation is a similar action, though this time .i. is used and items may be given various types of punctuation in the listings. When Indexing is required, a memory file is generated from the text, complete with pagination, and this is automatically numbered and alphabetised before being laid out in the final file. This process works at the end of the document, and the new index can be given a separate file name for printing or left attached if desired. Other .x. controls can be created to cover your needs in other tables as required.

Now – once the initial transition has taken place – there is no turning back.

Other new features include being able to move columns of text in tables, and resort and rearrange them without losing the information relationships within the tables. Simple mathematical calculations including percentages, matching paragraphs side by side in column mode, and hiding explanatory texts in documents can be done, without these being printed in the finally output material. Many actions are now simpler to select, and operate more quickly. All these new features, together with the enhanced regular ones in other Word activities, provide a significantly improved tool for producing an exciting range of work.

Other enhancements to former features include: automatic line spacing based on font sizes; glossary printing; time/date marking when creating or printing; multiple page footnotes; variable tab settings throughout documents; and expanded graphics support (640 x 400) for your screen displays.

Those who have used Word before will notice changes made to various areas (like the format commands and layouts), and through my experience of using them during this period of six weeks I found once mastered they are certainly worthwhile in giving more speed and ease of operation. New formats for printer files, plus more printer support files and a separate manual giving directions for altering or creating your own printer file structure are handy too.

In my daily task of writing, I have agonised for months over the creation and transfer of text between systems (and the problems encountered), formatting and setting up for still further output for the laser printer. Other tasks such as monthly magazine and newsletter production, have further highlighted the supporting features of Word 2 programs further enhanced here.

Total flexibility is the user's experience over the widest range of word processing requirements.

Now – once the initial transition has taken place – there is no turning back. Here is a truly upgraded package, most helpful in all general areas, and in some new areas outstanding. It is well able to produce the excellent quality documents required of the office, and doesn't cost an arm and a leg, plus many months of learning, to make it a pleasure to use.

Variety of machines

For the purpose of writing this review I have installed and run this word processor on several different types of personal computers, including laptops and various MS-DOS office systems. Using the provided setup program is straightforward and provides a well-organised system to maximise efficient operations.

Care should be taken of the interactive program like Spell, which works very quickly and well, but does create hidden files. It is a pleasure to use, and corrections come up fast and can be corrected and added to your dictionaries. A 215Kb main dictionary is provided, and in this international version tested, provided British spellings without faulting. User and document dictionaries are also provided. Other functions in this version include decimal, time and date styles.

Ease of action and real speed with Word 3 are seen on the new Compaq 386, where the high resolution screen, together with this vastly improved system, produce spectacular results. Used here in connection with Windows, Mouse and the Aldus Pagemaker, it performs most efficiently. Files transfer into the Pagemaker program through the Windows Write interface very quickly (few seconds) and then through the Pagemaker system design and layout actions into laser printer documents.

My own gear includes both daisy and dot matrix printers, which are easily managed from the menu screen when selecting printing. A good number of choices of daisy wheel font are supported too. Much less movement is now required with the improved mouse control system.

This word processor comes in two larger A5 manuals, one (*Using Microsoft Word*) containing all supporting information for the introduction to, and operation of, the program. The other (*Reference Microsoft Word*) is a complete reference to this system, with A-F appendices covering useful information like preparing documents for exchange (Multiplan & Wordstar), extended character sets, changing file formats, and other spell tools.

Another smaller manual contains all the helpful printer information. Other helps include the quick reference cards and the readme updates on the disks. The software comes on six disks, and the Learning programs cover two of these, one each for the mouse or keyboard control systems. They are easy to use.

Get a demonstration disk today (Brimaur or your dealer) and see for yourself this much-improved word processing program, which could so easily support your needs in the work place. It is useful for the discerning home-user too, and is available for network operations with suitable hardware arrangements.

Review system supplied by Microsoft Australia.

The chapter headings of the manual *Using Microsoft Word* give some indication of the functions available in Word 3. The first nine chapters run through the expected areas, but labelled under More Skills the subsequent chapter headings are:

10 Windows: Two Views at Once
11 Repeating Actions
12 Searching and Replacing
13 Using a Glossary
14 Page Formatting
15 Outlining with Word
16 Adding a Footnote
17 Adding a Table of Contents, Index, and Annotations
18 Working with Tables
19 Sorting Text
20 Spelling and Hyphenation
21 Creating Form Letters
22 Formatting with a Style Sheet

SPONSORSHIP
NATIONAL SECONDARY SCHOOLS FUNDRAISING PROJECT

During the month of March a national large scale fundraising campaign is being undertaken open to all secondary schools throughout New Zealand, culminating in the installation of several thousand business computers in all of these schools. Computer Imports as the major sponsor and organiser has underwritten the project to the extent of approximately $1,000,000.00.

Indications from these schools are that some 6000 computers are required. We have organised a national fundraising campaign, encompassing;

a) Major sponsorship by large national companies.
b) All secondary school children working for funds in the last weekend of March.
c) The selling of discount vouchers by all school children throughout the campaign.
d) The collecting of small donations by all householders and small business houses.

The entire campaign will culminate on the weekend of 27th, 28th and 29th of March with the "Working to EXZEL" weekend which is based on the "bob-a-job" concept. Students will be out in the community earning money through sponsored work. Naturally, the people who will be providing this work, the parents, business community and general public, will need to be informed of this project. Computer Imports have instigated an extensive advertising and public relations campaign planned to commence Monday, 16th March running through to the weekend itself. This campaign includes informative yet pacey 30 second television and 30 second radio commercials, and page dominant press advertisements. The schools will have placed large four colour posters throughout the community, and the students will be wearing identifying stickers as well as carrying official collection envelopes. So, by the time the project actually commences the nation will be well informed and highly motivated.

Computer Imports has prepared a full presentation to Principals which they will receive during February at the commencement of the new school year. This presentation clearly details the business computer package offered and the details of how the fundraising project will operate. This project will be highly significant to Principals as they need not expend any of their annual budget. The computer package itself consists of an EXZEL PC with monitor and keyboard along with four prominent software packages – PFS First Choice, Microsoft MS-DOS, Microsoft Word 3 and Microsoft Multiplan.

On the weekend itself the Nation will witness a flurry of activity whereby students will be "Working to EXZEL" for their School and their future.

After the event schools will complete the collection of funds and advise Computer Imports of their requirements. The schools will become the proud owners of the EXZEL business computer packages in May 1987.

So join in this campaign and invest in the coming generation of decision makers, TODAY.

You can do this in the following ways;

1. Make a donation.
2. Purchase a discount voucher book.
3. Provide a job for a secondary school student.

To facilitate this please utilise the following form:

RESPONSE FORM

Please complete and return to
The National Secondary Schools Computer Fundraising Trust
Freepost No. 1948, Auckland.

We wish to contribute to the National Secondary Schools Computer Fundraising Campaign in the following ways;

☐ I wish to make a donation of
$ .....

☐ I wish to purchase ..... (number) discount voucher books @ $10.00 each totalling
$ .....

☐ I wish to provide a job for a Secondary School Student and require ..... (number of students) for approximately ... (hours).

Personal/Company Details:
Name: .....
Address: .....
City: .....
Phone No: .....
I wish to pay by the following methods;
Cash $ .....
Credit Card $ .....
Cheque $ .....
I require a receipt ☐
☐ American Express
☐ Bankcard
☐ Visa
☐ Diners
Expiry Date: / /

☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

Signature: .....
Please credit .....
(name of Secondary School) with my donation.

The only communications network ECL doesn't service.

It's not surprising. Two tin cans and a piece of string was never the most efficient communications system. It only worked in a straight line and wasn't particularly private.

Today effective communication is the lifeblood of industry. Communication systems take many forms and perform many tasks from simple telephone, intercom and paging duties to the more complex energy and security monitoring functions.

Electronic Components Limited specialise in the designing and installing of sophisticated communication systems in commercial and industrial buildings.

Whatever business you're in ECL can tailor a system to suit you now and in the future. A well designed system would be able to cope with a network of computers, videos, televisions, telephones, smoke detectors, burglar alarms, temperature controls and be able to receive and transmit signals from satellite receivers, all using the same cable system.

Ideally ECL should be involved in the design stage of your building to enable them to work closely with the architects. This allows them to cater precisely for your needs at minimum cost. And when business expands the network will have the capability of growing with it.

ECL's association with Tisco means they can offer you a complete 'Turn-key' service.

(1) ECL will, in conjunction with you determine exactly what you need.

(2) ECL will design a system to suit.

(3) ECL will install the system.

(4) ECL will instruct your personnel in its usage.

(5) Tisco will then service and maintain the system.

If you're considering updating your present system, or thinking of installing one, your best bet is to start communicating now, with ECL.

Call us on (AKL 669 591) when you can get an outside line.

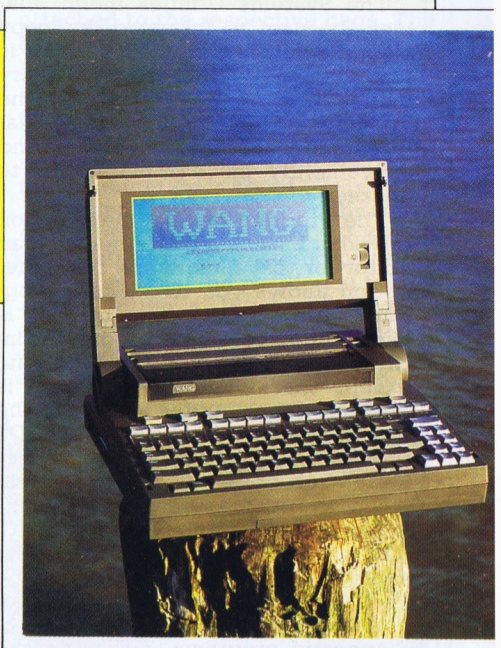
ECL

ELECTRONIC COMPONENTS LTD.

BGH1905E

Functionality and portability

by Jim Barclay



Christmas came a few days early for me recently when I was offered the Wang LapTop for evaluation. This computer is the newest member in the Wang family of Professional Computers. It weighs just 6.6 kg and contains in one unit all the tools necessary to create, view, store, print and transmit information whether at home, while travelling, or in the office.

It was an ideal opportunity to demonstrate the usefulness of the portable computer as our family travelled away for a few days' holiday. I loaded the program I was currently working on onto the internal 10 Mb Winchester drive using an external 5¼-inch floppy drive. (The Winchester is the only disk drive in the computer, there being no internal floppy drives.) A few minutes later when that was completed I zippped the Wang LapTop back into its case and slipped it into a spare corner in the boot of the car. A check of the manual quickly confirmed that Wang has taken care of travelling as the Winchester drive is insulated with a high tolerance for shock and vibration so that portability of the unit is not hindered.

The Wang PC is truly portable as the computer, LCD display, 10 Megabyte Winchester drive and thermal printer may all be powered from the internal rechargeable nickel cadmium battery (NiCad).

The Wang PC Portable came with 512 Kb of memory and both a 3½-inch and 5¼-inch external floppy disk drives. A large number of support documents were provided, together with five 3½-inch discs and seven 5¼-inch discs, the smaller number of 3½-inch discs being due to their higher 720 Kb capacity. In addition to the system disks there was also a disk for installing external printer drivers and a diagnostic disk.

The keyboard has a nice gentle feel, and when the positions of the additional keys are learnt, easy to use. The cursor keys to the right of the typewriter keyboard are arranged with the down cursor key straddled by the left and right cursor keys on one row, with the up cursor key on the row above. I found it took a little while to get used to this layout, as did the use of the EXEC key. Coming from a computer where the RETURN key is the primary action to implement a command, I had to check myself a number of times to ensure I was using the EXEC key rather than the RETURN key. However, no harm normally occurs when this happens as the computer is usually waiting for only a limited range of keys. The keyboard is quiet in operation, highlighting the light mechanical sounds of the internal 10 Mb hard drive when it is being accessed.

The Winchester drive rotates continuously when the computer is first turned on, but after a period it automatically turns off to save power. The drive automatically reactivates itself when disk access is required, but this appears to be for shorter periods than when it is first turned on.

When the external AC adapter is connected the internal 12 volt NiCad battery is being automatically charged. Charging a flat battery takes about six hours, and when the AC adapter is in operation there are some sections of the lower surface of the computer that are warm to touch, noticeable especially when it is being used as the name says, on the lap.

Having the computer away on holiday demonstrated the convenience of the Wang LapTop, as it allowed those "midnight inspirations" to be entered, tested and printed with the minimum of effort, without having to wait those anxious days to see the effect of the lateset program change.

Software

The LapTop system consists of MD-DOS 3.20 and Wang enhancements such as systems utilities, menus and industry standard emulation. When the PC is turned on, and after the power up initialisation, the screen displays the Wang System menu. Here you may choose between application, communication and printer programs. The items in the Main Menu may be obtained by pressing either the space bar or the first letter of the name of the task you want to perform. The manuals also provide a pictorial representation of how the menu screens relate to one another, giving the user a quick appreciation of the Wang menus. I found this particularly valuable.

When the DOS Command Processor option is selected there are three operating environments in the Wang system software. Wang PC applications, such as Wang Integrated Word Processing, systems and menus are run in the Wang mode. The LapTop supports software from the Wang Professional Computer series, including the system glossary, PC database and Microsoft Chart. In addition to the Wang application software many other standard applications can be run in the industry standard modes.

There are two of these modes that make this machine's keyboard and screen emulate the modes widely used by industry, the industry standard monochrome and colour modes. Changing from one mode to the other is very simple, only a few keystrokes being required, with the actual mode displayed on the screen to the left of the prompt.

The documentation provided included a list of the industry standard compatibility testing undertaken by Wang. This list featured most popular applications programs in both monochrome or colour versions. Of the nearly 100 programs and versions tested, 10 had remarks in respect of compatibility. These differences, however, were generally trivial in effect. Both my Wordstar and Multimate word processors were satisfactorily used, together with Lotus 1-2-3 and a cross assembler program XASM48. This latter program cross assembles code for the Intel 8048 single chip microcomputer family.

The Systems Utilities menu enables the user to format disks, copy files, display files etc. This menu is further divided into two auxiliary menus, one of these being for the Winchester drive. All of these features allow the user to rapidly, and conveniently, move from one task to another.

The Program development option provides Basic 3.20 together with an editor for text files, while the Other option allows you to execute programs without using menus. This is similar to executing a program from the DOS Command Processor menu, except that when the program is finished the computer returns to the System menu, rather than the DOS prompt. Both the Utilities and Other option can be readily accessed from any of the other screen menus.

The Wang LapTop is supplied with a number of disks. In addition to the system disks there is a diagnostic disk to enable the user to test for hardware faults by running a series of diagnostic programs, either on the Winchester or the external floppy drive. The progress of the diagnostic program can be monitored on the LCD display by the user. Some portions of the testing require user interaction, such as the test of the keyboard.

Although not provided with the review model, the Wang literature refers to the availability of the Wang Standard Network. This allows the computer to be networked with other computers in the Wang Professional series. Wang VS terminal emulation is available through the networking software, while other optional terminal emulation software is also available.

Communication

The Wang LapTop is well equipped for remote communication. Removing the expansion slot cover on the back of the computer allows the user to install one of the two optional modems. Both modems support either synchronous or asynchronous communication, but with different speeds, in the range of 300 to 2400 bps. The internal modem is also powered by the internal NiCad battery, further enhancing the portability of the computer. Two BJ-11 telephone jacks are provided, one intended for connection to a telephone line and the other for connection to a telephone.

Adjacent to the telephone jacks is an external RS-232-C connector. This interface is fitted as standard, enabling optional devices such as external modems or printers to be used. To use a parallel printer, a serial to parallel interface must be used, but this is also a Wang optional device. The communication menu allows the user to readily toggle between the communication port and the RS-232-C interface.

The Wang LapTop is well equipped for remote communication.

A total of seven ports is fitted to the computer. In addition to the three ports on the left hand side described previously there is an AC power adaptor port on the rear with the numeric keypad and SCSI ports on the right hand side. The external colour monitor port is located inside the right hand LCD support, readily accessed by releasing the two catches and lifting out the complete LCD and cover assembly, exposing the colour monitor connector. The numeric keypad port is used for Wang supported input devices such as the optional numeric keypad, and will also support devices with data transmission rates up to 9600 bphs.

When the computer is turned on the system automatically begins the start-up diagnostic tests. These check major parts of the system to see they are operating normally, and normally take about 30 seconds. A warm start is accomplished by pressing the 2nd(Alt) and Command(F13) keys together with the Cancel key.

The main NiCad battery has a typical duration of up to four hours. To conserve power the system software loaded during installation includes an automatic shut down feature. If the computer is in the System menu for more than 10 minutes without a keystroke, the computer will automatically shut off, but this time may be altered to other values by the user. When the main battery is running low, with about four minutes remaining, there is a continuous beep and a screen message advising the user to plug in the AC adapter. A small secondary battery is also provided to ensure continuous operation of the computer's internal clock when the main NiCad battery is depleted or when the user wishes to install a more fully charged battery. Provision is also made for the power to be supplied from a car cigarette lighter power adaptor.

Although the LapTop is designed as a portable computer commonsense is still required to minimise the possibility of damage during travel. Wang recommends that heavy or shifting items should not be placed on the computer, and also that the computer should not be checked through as airline baggage.

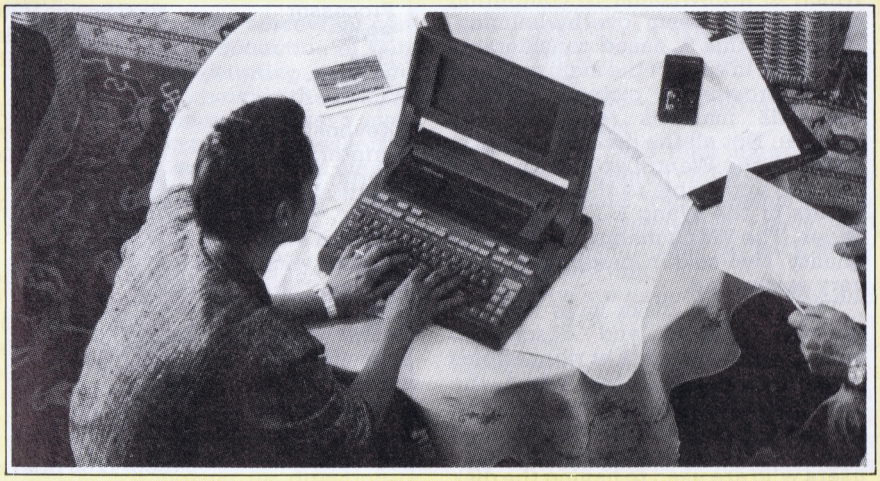
Printer

An Epsom MX-80 compatible printer is integral to the Wang LapTop, mounted to the rear of the keyboard. The thermal printer is capable of NLQ dot matrix printing at 18 cps, and also supports graphics, enlarged, and condensed printing modes. It may also be used with standard paper when the small ribbon cartridge is installed, but the print quality is better with thermal paper. The printer ribbon is a one-time thermal transfer ribbon with a life of 40,000 characters.

A paper roll attachment is supplied and fits to the rear of the computer, but alternatively single sheets of paper may be used. The printer ROM contains two character sets. The WISCII character set is used by the Wang Integrated Word Processing program while the standard ASCII character set is used by some other Wang programs and most industry standard programs. Two escape codes are used to move between the two character sets.

The knobs and levers for the printer are unobtrusive and are located in positions that will minimise damage, particularly when the computer is being transported. The printer platen knob, for example, is recessed in the support arm for the LCD display. A switch near the main power switch allows the printer to be turned off or on with one of two darkness settings. I found the printer silent in operation, partly attributable to the modest printing speed of 18 cps.

The printer utilities disk supplied provides printer drivers for a number of serial printers. Parallel interface printers are not supported directly, but indirectly through an optional serial to parallel interface.



The final port is the SCSI (Small Computer Systems Interface) port. This port provides an industry standard interface for external storage devices and peripherals. It is capable of interfacing with up to six devices simultaneously. However, not more than two external disk drives may be included in this number. The 3½- and 5¼-inch disk drives provided with the computer for review each has two SCSI connectors, enabling daisy-chaining of the devices, with a line terminating plug being required in the last drive.

The power supply for the devices used on the SCSI port of the computer must be supplied externally. Power for the 3½-inch disk drive is provided by a second low-voltage lead on the AC power adaptor, while the 5¼-inch drive requires AC power. Should this configuration be used, reasonable space allowance should be made for the disk drives and all the associated leads and cables.

Hardware

The Wang LapTop comes in a rigid grey case, and when the LCD cover is closed the computer is a compact unit that fits into a soft padded carrying case, equipped with both a handle and shoulder strap. An accessories bag is also provided, which may be attached to the carrying case when one end of the shoulder strap is attached to the respective bags. The accessories bag is large enough to hold the AC power adaptor and a paper roll for the printer, also leaving enough room for either a 3½-inch disc drive or an accoustic coupler and numeric keypad. The total weight of the combination is about 13 kg.

Releasing two catches on the top of the computer allows the LCD screen to be raised to the viewing position. The screen may be positioned to any angle, within a 180-degree arc, to enable the best screen display to be obtained, and a brightness knob is also provided. I found the SuperTwist display screen very readable in many different lighting situations, including both bright daylight and poor night conditions. The LCD supports graphics and text modes with resolutions of 640 x 200 or 320 x 200 pixels. A CGA-compatible controller is included with each computer, and CGA applications may be displayed in monochrome on the LCD display or in colour on an optional separate colour monitor.

The keyboard is equiped with full-size keys that show both Wang and IBM legends. The layout is closer to that of a typewriter with the Control, Alt, Backslash and Back Apostrophe keys on either side of the space bar. Some of the 76 keys are used for the printer, help function and cancel etc. There are a further 16 function keys in a row above the main keyboard, and a function strip carrier is provided next to the format keys. Wang provides an Editor function strip together with a blank strip.

Of the three green LED lights, One is located in the Lock key to indicate uppercase alphabetic characters, another indicates the Winchester drive is in use, and the third is used by certain applications for message signalling.

The Wang LapTop is built around a CMOS 8086-compatable 16-bit microprocessor operating at 8 MHz. Wang states the processing speed is

improved at least 10 per cent over the speed of the 8086 chip.

Although only some of the optional hardware was provided I found it readily installable, either using the external connectors or else to sockets on the main PCB accessed when the expansion slot cover is opened. Small booklets, provided for each of the optional devices, provide ample guidance on how to install that equipment.

Documentation

The Wang LapTop has a very extensive range of documentation which to a newcomer to computing may initially seem overhwhelming. However, this is eased considerably by a chart in each of the main manuals which provides a pictorial view of how the manuals relate to one another. Not all the manuals are exclusive to the Wang LapTop, as some are also applicable to the other computers of the Wang PC Professional series. The Wang manuals are a high quality two-colour production, and very easily read.

The 5¼-inch disks have both an orientation label and descriptive label. These labels are at right angles to each other so that when the descriptive label is readily readable, with the disk in the dust jacket, the disk is not correctly orientated. Those users who are used to having the disk description on the outside should take extra care, particularly when withdrawing a disc from its dust jacket.

Other benefits

The internal NiCad battery pack allows operation without external power for up to four hours. A further advantage of the NiCad is that when it is coupled with the external power pack, a very reliable power supply is provided for critical realtime applications.

One example of the use of this computer would be in the scoring of sports events. Many of these, such as motor racing and gliding, require recording of time and other information on a real time basis. The combination of the AC power pack and the internal NiCad battery pack provides a secure power supply for these applications, an important consideration when normally-powered computer equipment is used on mains supplies of poor reliability. This computer has the ability, with the addition of the AC power adapter, to provide a very reliable sports scoring system, whether indoor or outdoor, with the ability to enter and store data then both display and print the processed data.

Microcomputer Summary

Name:	Wang LapTop
Manufacturer:	Wang Laboratories Inc, USA
Processor:	NEC Series V30 8086 compatible (8MHz)
RAM:	512 KB expandable to 1 MB
Disk:	Internal – 10 Mb Winchester drive
Display:	High Contrast LCD, 320 x 200 or 640 x 400, 25 x 80 characters, 220 x 95 mm display
Keyboard:	Full size keys with IBM/Wang legends
Printer:	Integral thermal transfer printer
Ports:	RS-232-C SCSI (Small Computer systems interface) Colour monitor 2 x telephone Numeric keypad
Options:	External – 3.5" (720 Kb) battery operated and/or – 5.25" (360 Kb) AC powered disk drive Acoustic coupler Numeric keypad Serial to parallel adapter Memory expansion module 300/1200/2400 bps modem 300/1200 bps modem
Power Supply:	AC adapter 220-250 V AC / 21 V DC Rechargeable NiCad battery
Weight:	6.59 kg – portable computer 4.18 kg – carrying case, bag, AC adaptor
Price:	$8995 Wang LapTop $9500 Wang portable and 5.25 inch drive $9995 Wang portable and 3.5 inch drive

Overall rating

With the Wang LapTop you do not have to compromise functionality for portability. The LCD display provides an easy to read reference and hard copy can be obtained using the internal thermal printer. In the office you may attach an optional colour monitor or else operate as a fully functional workstation connected to a Wang VS minicomputer.

When you take the computer home all the software and files you have are able to go home with you. When you go away the battery power and communications facilities allow you to keep in touch with the office and enable you to obtain up-to-date information on produce, pricing and orders.

The Wang LapTop must rate very high in its ability to undertake such a wide range of computer tasks, with the convenience of portability and the ease of use through the extensive screen menus.

Public Domain Software

Many may wonder what this term refers to, the sort of products available, and how to get access to it.

Public domain software (PDS) is product that has been written by computer buffs and developed to the general public free of charge. The programmers do not secure copyright for their work but merely pass it over for general release. As well as a vast range of games and operating system tools, there are accounting systems (of a basic nature), word processors, databases and spreadsheets available through the public domain.

Naturally, there are disadvantages over standard software products:

- There is no guarantee as to product stability.
- Generally no documentation exists in the form of manuals, though text files on the disk give the user some useful advice and assistance.
- No support is offered.
- No regular product updates occur.
- It is unlikely any logic errors will be fixed.

PDS is for the enthusiast, the user who is able to spend hours tinkering with his PC, playing games or developing his computer knowledge.

There are some fun products about, but do not consider them potential drivers of your business sytems. Direct access to PDS can be gained through computer user groups where the cost to you is likely to be the price of a disk and perhaps a small handling fee.

If you retain the philosophy that any valuable piece of software will be charged for, PDS will receive the level of recognition it deserves.

Cheap PC clone users – was it worth it?

Having witnessed the inroads cheap IBM clones have made into the marketplace, we are now totally convinced that the typical NZ consumer has one prerequisite and one prerequisite only – price.

What we continually wonder is whether those who have bought the cheaper PCs, often with bundled software, now consider it was a sound move. We hope so, because there is a good number of you out there.

Where we became somewhat concerned was the introduction of bundled business accounting software, which seemed to provide the magical ingredients to convert a user's manual system to computer, hassle-free. Did the buyers succeed or, as we suspect, did the support vaporise when it was so critically needed?

So long as your hardware is reliable and has adequate capacity (memory and disk storage) and you have purchased software that has a reputation for dependability, then there is every chance you can make the computer system pay for itself. Often it is just a case of having an experienced person behind you making sure you are kept on track.

If you are looking for direction or help, contact MicroLab. We can put you into touch with people that can assist you.

At last – system audit trails

Those of you used to running under MS-DOS will be conditioned to the lack of system audit trails which monitor the activity on your computer system.

This month we have read about a product, Logger, resident in memory, which records who is using the PC, what systems are being worked on, what software is used, what data files are being accessed and how long a user is logged on.

It would seem to have the answer to the problems encountered when a site must restore from backup. The question always asked is, "What have we processed on the computer since our last backup?" Confusion and doubt invariably set in.

A product that monitors activity would be invaluable in a "restore from backup" situation. Those activities that were performed could be reprocessed in the same sequence by following the system log or audit trail.

Logger includes a security protection system to prevent unauthorised access to your software. It is designed for an IBM or compatible PC with hard-disk and minimum 384Kb. (If your machine is less than 384Kb, the upgrade is likely to be inexpensive.)

Logger will replace your manual system log and will add considerable integrity to those businesses using no system monitor of any kind. It has application, we are told, also in areas of: client and account billing (recording times spent); system cost analysis; and staff productivity control.

Laptop portables

For those unsure how a laptop compares with a portable, there is a simple explanation.

- Laptops are truly portable, light and compact.
- Portables take their name in the loosest meaning of the world. They are noteasily transportable in that they are frequently heavy and bulky, though they do pack away into a tidy unit.

Laptops are generally the size and weight of a typical businessman's briefcase, easily portable and designed to be robust.

Unlike the standard computer screen, the laptop incorporates LED or gas plasma display which allows the viewing screen to be much more slim and therefore compact. Clarity does vary and it seems from our evaluations that amber on black offers the best option.

Laptops can offer hard disk storage as well as floppy drives, and generally allow significant RAM upgrades, some to 2.5 Mb.

There are three new laptops on the market: the Toshiba T3100, the Data General/One Model 2 and the Wang. The former we have evaluated whilst the Wang and the DG we can only assume are worthy of consideration. We agreed that the Toshiba is a very fast and powerful machine with a high level of IBM compatibility. With its 80286 chip it is both PC and AT compatible.

As with any new technology it suffers from being expensive. At almost $11,000, it hurts. However, you must pay for quality in this industry.

If you need mobile computing because you are a frequent business traveller, or need to work at home or would like to introduce the family to computing, then laptops are the only answer.

MicroLab is Coopers & Lybrand's micro computer consulting arm providing independent advice on business systems.

Through this column MicroLab offers a commentary on developments in the computer industry as they affect the business person.

Programming Solutions can be as elusive as the Cheshire Cat.

Alice will help you through the Pascal maze.

To a lot of people, computer programming is a Wonderland inhabited by March Hares and Hatters, speaking a language of their own, and about as accessible as Lewis Carroll's strange looking-glass world.

Though now, if you own an IBM or compatible personal computer, you've got a personal guide – ALICE: The Personal Pascal.

ALICE is a unique and powerful piece of software which enables you to write your own programs, and introduces the world of Pascal, the computer language. For the novice, ALICE makes learning Pascal simple, with an "intelligent" editor making the mechanics of writing a Pascal program nearly as easy as "filling in the blanks". Experienced programmers will find ALICE's interpreter the most advanced source-level Turbo Pascal de-bugging tool available.

"What is the use of a book," thought Alice, "without pictures or conversations?"

The same comment applies to a programming environment – ALICE provides over 500 "Help!" screens, with context-sensitive help, ranging from "What can I type here?" to "What program called up this sub-routine?". At the same time ALICE provides immediate assistance with problems, instructing the user about Pascal – so programming gets easier and easier.

"That's the reason they're called lessons" remarked the Gryphon: "they lessen from day to day."

There are no language tricks, because ALICE knows all the rules of Pascal. This allows you immediate type and syntax verification as you go along – ALICE won't let you make a mistake!

"I can't explain myself, I'm afraid, sir," said Alice...

Our ALICE certainly can explain herself. In fact, explaining is one of her biggest features. Contact us, and let ALICE be your guide to the Wonder land of computers. Available through Microway or your local dealer at a price that makes ALICE truly wonderful.

ALICE

The Personal Pascal™

Yes, please rush me a copy of ☐ ALICE. ☐ all the literature

Name .....

Address ..... P/C

Ph: ..... Signature .....

292 Chesterville Road, Moorabbin, AUSTRALIA 3189. Phone (03)555 4544

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Expansion capability

the Panasonic Business Partner 286 FX-800

by John Lau

Yet another review of an AT compatible personal computer. There has been a flood of them on the market lately. Everybody is trying to capitalise on the popularity of the 80286 standard, with each trying very hard to market something special. The standard has been set by IBM with the PC AT, so for anybody else to be successful, they must be seen to be 'better', in more ways than one.

This package is put out by Panasonic Industrial Company which is a division of Matsushita Electric Corporation. You may know them as one of the giants of the electronic industry which manufactures all sorts of electrical appliances, and I am prepared to say that one would not have to worry about getting parts and support, or about the stability of the parent company.

Opening the cover reveals that the FX-800 offers a total of 10 slots, seven long and three short ones.

Some of you would have come across other computers from this company. Among the portable PC-compatible range are the Panasonic Senior Partner (RL-H7000 series), Silent Partner (JB-3300 range) and Executive Partner (FT-70, FT-80 series), while the desktop XT equivalent is the Business Partner FX-600. The Business Partner FX-800 is the top of the Panasonic range.

The whole package comes in the familiar two cartons. The big box contains the main processor plus keyboard and manuals, while the colour monitor completes the other box. Both cartons are securely packed and should withstand the rigours encountered during tranportation.

It took me about ten minutes from unpacking to connecting all the interfaces and switching it on. So if you are well versed in the PC fields, you should experience no problems in this area. Nowadays PCs are more or less classified as consumables, i.e. pay your money and take your product. Seldom are they accompanied by servicemen who have to set them up in a specialised way.

The Panasonic Business Partner 286 main unit consists of a 5¼ inch half height 1.2 Mb diskette drive (A) and a 360 Kb drive (B), also a 5¼ inch half height unit. They are stacked one on top of the other, occupying the right third of the enclosure. There is an internal 20 Mb hard disk to the left of the floppy drives. There is space to install a further device, be it another hard disk or a streaming tape back up unit. The rest of the front panel consists of a keyboard key lock, socket for the keyboard interface, and three LED indicators which show that power is on, processor speed (fast or slow mode) and the third when accessing the hard drive C.

The FX-800's main processor unit is the 80286 chip running at 6 or 8 MHz, dip switch selectable. However, the dip switch is located inside the unit and it will take some time to fiddle with the switch after taking the cover off the unit.

It goes without saying that a 80287 co-processor socket is provided on the motherboard. When installed it will boost the calculation intensive applications a bit.

Expansion

The system comes with 512 Kb of RAM, which can be expanded to a total of 15 Mb should the need arise. A total of 1 Mb can be accommodated on the motherboard, but further memory would necessitate the purchase and installation of expansion boards.

Opening the cover reveals that the Business Partner 286 offers a total of 10 slots, seven long and three short ones; long slots meaning 16 bits and short ones 8 bits. Two of these are already occupied by the Centronics parallel port and a colour/monochrome graphics adapter. There is no doubt as to the expansion capability of this system.

As in most personal computers these days, the FX-800 comes with a built-in clock and calendar with battery backup. This enables the computer to keep the correct date/time even after you power it off, to save the hassle of entering date and time every time you boot up. Also MS-DOS will date/time stamp your files with the

right values. Do not forget to adjust to daylight saving time in the summer seasons.

Facing the computer, to the bottom left, is a dual function security key which enables you to lock the keyboard to prevent someone else accidentally or maliciously corrupting your data. In addition, it can lock the unit, preventing unauthorised access. However, my criticism is that the key is symmetrical, which makes it very hard to tell whether the key is in locked or unlocked position.

Keyboard

The keyboard is a cross between the old IBM AT and the new AT keyboard; old meaning the 6 MHz version and new, the latest 8 MHz model. The 10 function keys are in two columns on the left, and it also has a separate set of cursor control keys. This is a moderately convenient feature when using the numeric keys a lot. It saves having to use the Num Lock on and off key continually. On the top right are two LED indicators showing status for Num Lock and Scroll Lock. The Cap Lock is located under the right shift key.

Personally I find the keys make a rather irritating and noisy clackety-clack sound, far too much for my liking. The keys' springs are lightly loaded and thus not firm enough. Really need a sports suspension package here. No keys are marked in any way like those on some other keyboards, quite a lot these days having slightly raised '–' on F, J or 5 keys.

I am prepared to say that one would not have to worry about getting parts and support, or about the stability of the parent company.

However, the return (Enter) key is comparatively large which would be a joy as it is one key that one can hit without missing (for all you two finger typists out there).

Monitor

The RGB monitor displays 80 columns by 25 rows. Without any EGA card, the colour graphics card only shows 640 by 200 pixel in two colours, or 320 by 200 in four colours. The resolution is very poor. Often two adjacent characters are so close together that reading the screen is a bit strenuous on the eyes.

Unfortunately, the Panasonic monitor and card were not available at the time of review, the monitor being of another make and the card of Taiwanese source. Standard New Zealand equipment will be the Panasonic monitor and FX-BG171 colour/monochrome graphics adapter (normally optional in other countries), externally switchable between colour and monochrome. Apparently it offers much better colour resolution, as well as the high-resolution monochrome so important to text.

IBM compatibility

No problems were encountered in this respect. All software that I could lay my hands on worked on the Panasonic Business Partner 286. These included Symphony, Open Access, DOS 3.2 etc.

It was noticeably faster running in 8 MHz mode compared with 6MHz. If

you are the impatient type, 8 MHz would be your only setting. Since IBM AT (the new ones) uses the 8 MHz version of the 80286 chip, you should be safe with virtually all software written for it.

Summary

In the final analysis, I find that the floppy diskettes arrangement is very convenient although not used to the push button arrangement for unloading the disks. I found no problem using 1.2 Mb AT diskettes or 360 Kb PC diskettes.

If your budget does not stretch far enough for you to afford a genuine IBM AT, then this system is some $3000 less and would probably go a long way towards providing a good quality printer.

Now the features that do not find favour with me are noisy fan, noisy and light keyboard keys, almost inaccessible dip switch, and the keyboard lock key. These few not so good points could be improved for the system to compare more favourably with others currently available in the marketplace.

These days, with so many companies selling PCs and each trying very hard to get its share of the market, you just have to demonstrate that your product is better in some ways than the others (especially IBM). With such a wide range of personal computers available, everybody has now become rather more choosy. I suspect the NZ Panasonic dealer might not have an easy time ahead as I feel the Business Partner 286 is just another AT compatible, nothing too spectacular to boast about, although its sourcing from Japan with good reputation for engineering and reliability must work in its favour.

Computer Summary

Name:	Panasonic Business Partner 286 FX-800
Manufacturer:	Panasonic Industrial Company, Japan
Processor:	80286 6MHz (default) switchable 8MHz
Memory ROM:	64 Kb
RAM:	512 Kb expandable to 15 Mb
Storage:	one Floppy disk, half height 5¼" 1.2 Mb one Floppy disk, half height 5¼" 360 Kb one internal 20 Mb hard disk
Keyboard:	95 keys including separate cursor keys and 10 function keys
I/O:	Centronics Serial
Expansion slots:	7 x 16 bit 3 x 8 bit
Others:	Real time clock/calendar with battery backup Keyboard lock key
Display Monitor:	80 columns by 25 lines 640 by 200 pixel in 2 colours 320 by 200 pixel in 4 colours
Cost:	$9130 including GST

Reviewed system supplied by Microcomputer Electronic Company Limited, Auckland.

The new revolution in the production of printed matter

by John Slane

If the claims of distributors are to be believed, anyone with a 16 or 32 bit computer has the potential to be a typesetter, graphics artist and lay-up expert for only the cost of the necessary software ($1000-$2000). Is this claim fact or fiction?

At long last the experts in typesetting, word processing, computer graphics and software engineering are starting to talk to each other and pool their expertise.

About time too.

Recently the market has had dumped on it so-called Desktop Publishing programs which are competent in only one or two aspects, being perhaps brilliant at graphics and incompetent at typesetting – or vice versa. One of the most widely used, PageMaker for the Macintosh, clearly lacked the input of anyone who knew much about typesetting. It did, however, have designers who knew a great deal about word processing and computer graphics. On the other hand another publishing program, PC/TEX, using rather convoluted commands, can do anything with precision placement of text, but graphics are extremely limited.

Fortunately the developers are listening to the feedback from users, and some of the inadequacies are promised to be remedied in "the next release"!

Let's start from scratch and see what this desktop publishing is supposed to be. First of all, some definitions so we know what we are talking about.

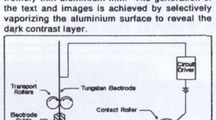
What is "publishing"?

Publishing is generally understood to be the reproduction of many copies of the original material, or "master". In the traditional sense, publishing refers to material with a high text or information content. Books, newspapers, magazines, newsletters, pamphlets and so on fall into the category of published material. Perhaps less obviously, in the context of desktop publishing so do such things as letterheads, business cards, invoice forms, restaurant menus and wedding invitations.

On the other hand, the preparation and printing of a letter to one particular person is not regarded as publishing. A one-off letter should be neat, attractive and produced efficiently, but there is seldom a case to present it as a piece of graphic art. However, there is a case for going to some trouble over the production of an original which will finally be read by many people – millions in some instances!

The Technology Principles

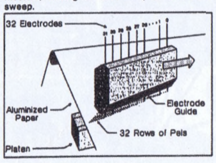
The Electroerosion Process uses special paper and a writing stylus to create text and images. The paper backing is coated with a black varnish; this contrast layer is covered by an extremely thin aluminium film. The generation of the text and images is achieved by selectively vaporizing the aluminium surface to reveal the dark contrast layer.



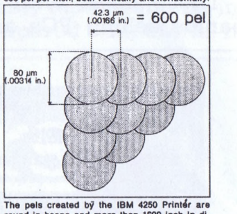
The print mechanism consists of the writing electrode, a very thin tungsten wire, a high precision electrode guide, an electrode driver, which functions as the electronic switch, the current source and the contact roll. Transport rollers compensate for the ware of the electrodes during the writing process. The electrodes and the aluminium form part of an electrical circuit which, when activated, results in a brief but intense current flow that vaporises the aluminium directly beneath the electrode to reveal the varnish underneath. This small, round black spot is called a picture element, or "pel," and is the basic unit with which the images of characters and graphics are formed.

The IBM 4250 Implementation

The IBM 4250 Printer employs 32 electrodes held in a guide which moves horizontally across the medium, writing 32 rows of pels with each sweep.



The guide is carried at a slight angle to its direction of travel so that the rows of pels are spaced 1600 inch apart. As the guide moves across the medium, the electrodes are fired so that the pels in each row are also spaced 1600 inch apart. This gives the printer a resolution of 600 pel per inch, both vertically and horizontally.



The pels created by the IBM 4250 Printer are round in hsape and more than 1600 inch in diameter. Consecutive pels overlap considerably, resulting in very smooth edges on printed characters, rules, and graphics.

The Electroerosion Paper

The electroerosion paper was a major part of the development effort for the IBM 4250. Two categories of characteristics involved the development process:

1. The influence on the writing process
2. The application usage of the paper

The application usage of the paper involves the compatibility of the spectral surface characteristics of the electroerosion paper with regular white paper and photographic paper.

The aluminium surface of the medium is rather abrasive; because the tungsten electrodes are actually held in contact with this surface as the guide moves across the medium, they are gradually worn down. The guide carries a special "feeler" electrode which measures electrode wear. As the writing electrodes are worn down, they are automatcially advanced to mainting optimum length.

This material was typeset and printed on the IBM 4250 printer.

Why "desktop"?

Desktop refers to the capacity to prepare the original printing masters in an office environment rather than a specialised typesetting workshop. The setting up of copy for publication can be done on an ordinary office computer which may already be used for accounting, management and word processing duties.

However, in order for desktop publishing to be an acceptable alternative to conventional typesetting technology, one further item of hardware needs to be linked to the micro computer and its desktop publishing software – a suitable printer that will provide a high definition hard copy suitable as the master from which the printing plate will be made. At this stage the printer most often recommended for the office environment is one using laser beam technology.

Desktop publishing in action

Now let's describe an ideal situation where the software and hardware have no shortcomings. If any reader knows where such a configuration exists,I would be grateful to be told!

Step one

The publication content and layout will be planned. This could consist of rough hand-drawn sketches of each page. It is unlikely the use of the computer would be required at this stage.

The outline will show what standard frames, headers and footers will be used and give an approximate idea of where the text headings will be

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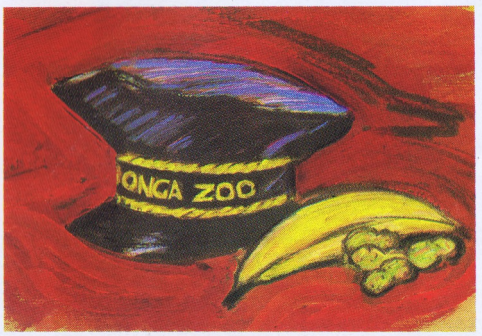

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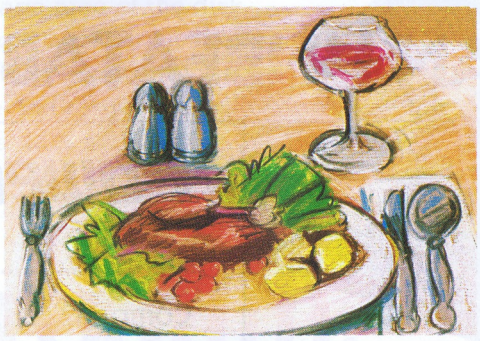
AND DID MORE THAN JUST CATER TO ANGELA'S CUSTOMERS, BUT DISHED UP PRIZE MONEY OF $3,000!*



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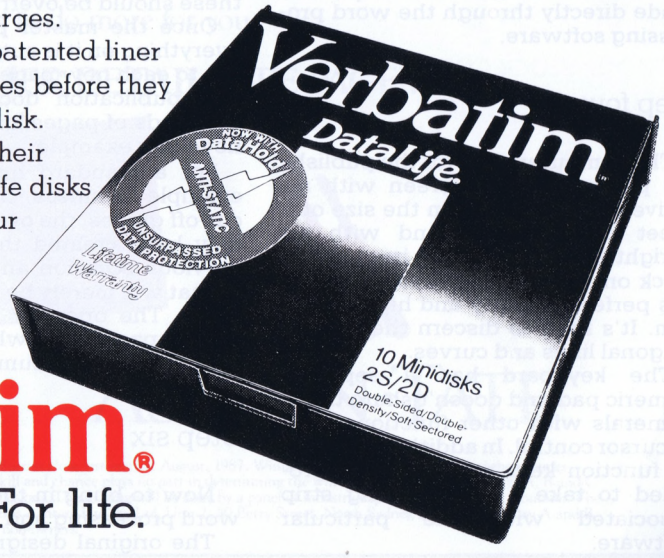

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and their sizes, placement of graphics or photographs, number and position of columns. If the publication will be printed in more than one colour, then the parts that will be different colours will be indicated, probably with coloured felt tips.

Step two

Copy for the proposed publication, if it is to involve a reasonable amount of text, is typed up on whatever is the preferred word processing software and hardware. If all or some of the required copy already exists in a word processing file, it does not need to be retyped.

Graphs, diagrams, logos and the like will be prepared efficiently and economically directly by the computer with its appropriate software. Graphs will be generated directly from the data which is already held in data files.

Photographs and artist-created line or halftone drawings will be put through the image scanner and converted to digitalised graphics objects on named files or separate pages in a "Scrapbook" or "Clipfile". In the case of photographs, the electronic scanning will have provided copies with a resolution of at least 1000 dots to the inch so that if dynamically enlarged later (say up to 10 times) they can still be computer-screened to an acceptable 100 dots to the inch for offset litho printing.

All graphics will be stored as formulae, not bit-image. This makes them capable of infinite reproportioning without degenerating smoothness of definition.

Step three

Everything is proof read from copy produced in high speed draft mode. Corrections and amendments are made directly through the word processing software.

Step four

The computer used for the publishing program has a screen with an active area greater than the size of a sheet of A4 paper, and with an upright orientation. The images are black on a soft white background. It has perfect linearity and high definition. It's hard to discern the dots in diagonal lines and curves.

The keyboard has a separate numeric pad and doesn't share those numerals with other functions such as cursor control. In addition there are 20 function keys with a recess provided to take a key labelling strip associated with the particular software.

The computer is loaded up with the desktop publishing program.

Now the magic begins!

If all or many pages are to have a standard format such as borders, frames, logos, headers or footers and page numbering, then the operator starts by creating a master page with all these requirements on it.

The dimensions of the paper and the size and placement of the maximum image on it are set up. Standard or custom columns and the spaces between columns are entered in a general way and the computer automatically works out and actions the details so that everything fits and balances.

Boxes, borders, lines and shading – all cursor driven – snap automatically as required to the guidelines created from the initial setup parameters or to additional guidelines brought in later. Near enough is good enough in this computer-assisted environment.

All graphics, once created and placed on the page, are capable of any type of modification, redimensioning and reshading.

Text for a headers is typed in, in a mode similar to that for familiar word processing software – word-wrap, tabbing, indenting, etc. However, the publishing program has available a whole new family of options – type size and style (light, italic, bold, bold italic, etc), selected fonts such as Helvetica, Times, Avant garde, Century, Script – around 30 different fonts, selectable space between lines and paragraphs, and full control of the placement of individual letters and blocks of text. Text can literally be picked up and moved around the screen and placed with hair-breadth accuracy to exactly where it is wanted.

Any text typed at this stage automatically wraps between the column margins that were set earlier, unless the operator decides that these should be overridden.

Once the master page is created everything on it is automatically written to each new page as it is opened. The publication document can be hundreds of pages long – a full sized novel, for example.

For a standard master page, for example business cards 4-up with cut-off guides, the operator will probably have created this master on a previous occasion and the complete format will merely be brought in from a file. The operator can cancel the master page items whenever wished for a particular document page.

Step six

Now to bring in the copy from the word processing and graphics files.

The original design outline would have indicated where graphics and pictures should appear on each page, so the operator will probably start by placing these elements of the publication. The appropriate files will be opened and the illustrations selected, placed on the page where required, and cropped and/or sized to fit the spaces allocated. Photographs will be converted at this stage to dots at the chosen density to meet the requirements of the publication (coarse for newsprint publication, fine density for gloss art paper).

If frames are required around the graphics or pictures, these could be drawn now, of if the dimensioning was critical, the frames would have been drawn before the placement of the graphics inside them. Frame drawing requires only a starting and a finishing point – the graphics management software takes care of all the other parameters.

Placement of text is a breeze. Select the text file you want to start with, choose the beginning point on the page, and click the mouse button. Text from the file flows down the page, automatically aligning to the left and right columns you have specified. If any graphics or frames get in the way, the text flows around them.

Everything stops at the botton of the first column. You can start the flow again at the top of the next column or do some tinkering with the text already placed.

Probably the latter will be your choice.

Step seven

The process of "tinkering with the text" is a genuine typesetting task.

It is likely your text will have started with a main heading and perhaps one or two sub-headings. If your word processor has not already done so, the task now will be to size these headings, select an appropriate font style for them, and position the headings according to the indications in the layout plan for that page.

Select the text by highlighting with the mouse-driven cursor. Use the function keys to select the number of the designated font (this is much more efficient than scrolling through a font menu), another function key press and a number to select size, another key to select centred, flush left or flush right, or justified (spread from left to right margin).

Bingo! The heading now appears just as you have described.

Now, how far below the main heading do you want the next heading to appear? Choose the size of the drop – another function key plus a value. The second heading appears in the selected position. Choose the font style, size and positioning of the sec-

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ond heading and the drop to the line below.

Now look at the headings critically. Do they "look" right?

"Art" is not defined by mathematics. Each letter has been allocated a width value by the designer. This width includes a piece of white space to separate the letter from the next one in the same word. Depending on what the two adjacent letters actually are, this mathematical spacing may or may not look right. I'll deal with this aspect in more detail in Part 2 of this article next month.

The point to note at this stage is that if the large sized lettering doesn't look pleasing to the eye, it will be necessary to shift some letters closer to one another or move selected letters further apart. Once again, this will be efficiently done by highlighting selected pairs of letters and using a function key to ease them together or apart. As the screen representation of the page is "what you see is what you get", the task can be accomplished very efficiently.

Now let's look at the body of the text. A font style, size and line spacing needs to be selected to present a page that is pleasing to the eye, matches the nature of the message, and enhances legibility. The operator chooses the appropriate parameters and the text reforms to the new instruction.

Look at the bottom of the page. With the changes we have been making, the text has flowed below the bottom margin. The operator has to make a decision based on context and appearance as to what will be the bottom line of the column.

If the line selected is not the one that presently just rests on the bottom margin, all the text above will have to be shrunk or expanded a suitable amount to ensure "copy-fitting". One way of doing this is to change the spacing between all the lines above by a fractional amount. The other way is to open or close spacing between paragraphs. it's also possible to reduce or enlarge the size of the text – but don't mix text sizes between columns.

In our "ideal" publishing program the above requirements are actioned within a few seconds using the mouse and function keys.

If there is spare text now below the bottom margin, we siphon it up with the cursor, move the cursor to the text starting point in the next column, and start the flow of text again. Because the program remembers the last commands, the second column of text is in the same style, size and spacing as we just finished setting in the first column.

Then we move to page two, and carry on the process. At any point we can interrupt the flow of text or push up and siphon off the overflow. We can then bring in text from a different file and use as much of that as needed. The program remembers where we are in each file so the sequence of text is never lost.

Step eight

When all the pages of text are set up, the whole document (or critical parts of it such as opposing pages) needs to be appraised. Our program can bring in all the pages we want to see and present them in reduced scale on the one screen. This could result in further changes being made – using the criterion of good graphics design.

At this stage the document is ready for its first hard copy.

Step nine

The document is sent to the laser printer. Using its ROM based fonts, the printer reproduces each page exactly as it appeared on the screen, at a resolution of 450 dots per inch. (Currently, laser printers run at 300 dpi, but 450 dpi is theoretically possible although probably about the upper practical limit for this technology.)

Examine the full document, final proof reading and layout approval. If changes to the text are necessary, these can be effected directly within the publishing program since the program also incorporates word processing facilities.

If super-high quality is required, the document file can be read into a commercial typesetting machine. This also uses a laser beam, but the beam scans photosensitive paper and does not use relatively coarse electrostatic toner as in the laser printer. The typesetter is capable of over 2500 dpi resolution.

From the laser printer or the typesetting machine, hard copy is produced which then becomes the master for plate making and printing of as many copies as required.

Colour separation

The appearance of a document is generally improved with a splash of colour somewhere – although this usually about doubles the price for printing! Commonly the designer will select headings and borders to be printed in a colour.

The printer requires a separate plate for every colour. Desktop publishing programs provide a very efficient and elegant way to provide copy for these colour separation plates.

Suppose we just require two colours – black and red. Headings and borders will be red.

One conventional process is to produce a hard copy of the full page. The printer, following the customer's instructions, tapes strips of white paper over all the non-black areas and photographs the makeup to produce a plate that will be run on the press using black ink.

Then that masking is peeled off, and stips are pasted over all the non-red areas. The new makeup is used as the master for the second plate, which will be overprinted using red ink. It's a slow and fussy business and really only suitable for plates which are made by a platemaker's camera (which doesn't register the shadows made by the edges of the masking papers).

Of vital importance in the colour separation process is the maintenance of "register". This means that all the red images will maintain their original relationship with the black areas so that nothing is out of alignment. If the same master is used for both plates the only misalignment possible is if the printer doesn't do his or her job properly when running paper through the printing machine.

But desktop publishing software enables all the colour separation to be done in the computer itself. I create two identical copies of each page that will finally be printed in two colours. These copies are in perfect register with each other.

"Masking" is done by hiding all the images of the non-required colour – borders are made "no lines", text is set to white-on-white or black-on-black so it is invisible. If the print is over a textured background, then I "send the print to the back" as well as adjusting its colour. Graphics and pictures can be covered with a no-lines rectangle or freeform shape, filled with white, and pasted in front.

Twice as many pages have to be printed (on the laser or typesetting machine), but each page is a colour separation master. No hand masking is necessary. Using a blue pencil, label each page by its colour and the job is camera-ready for the printer.

Can you or your typist now be a publisher?

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Part 2 will look at the practical considerations in setting up in-house publishing, the special tasks and skills in creating "typeset" material, and the role and future for the hundreds of firms whose present business is based on providing typeset copy for printers and publishers.

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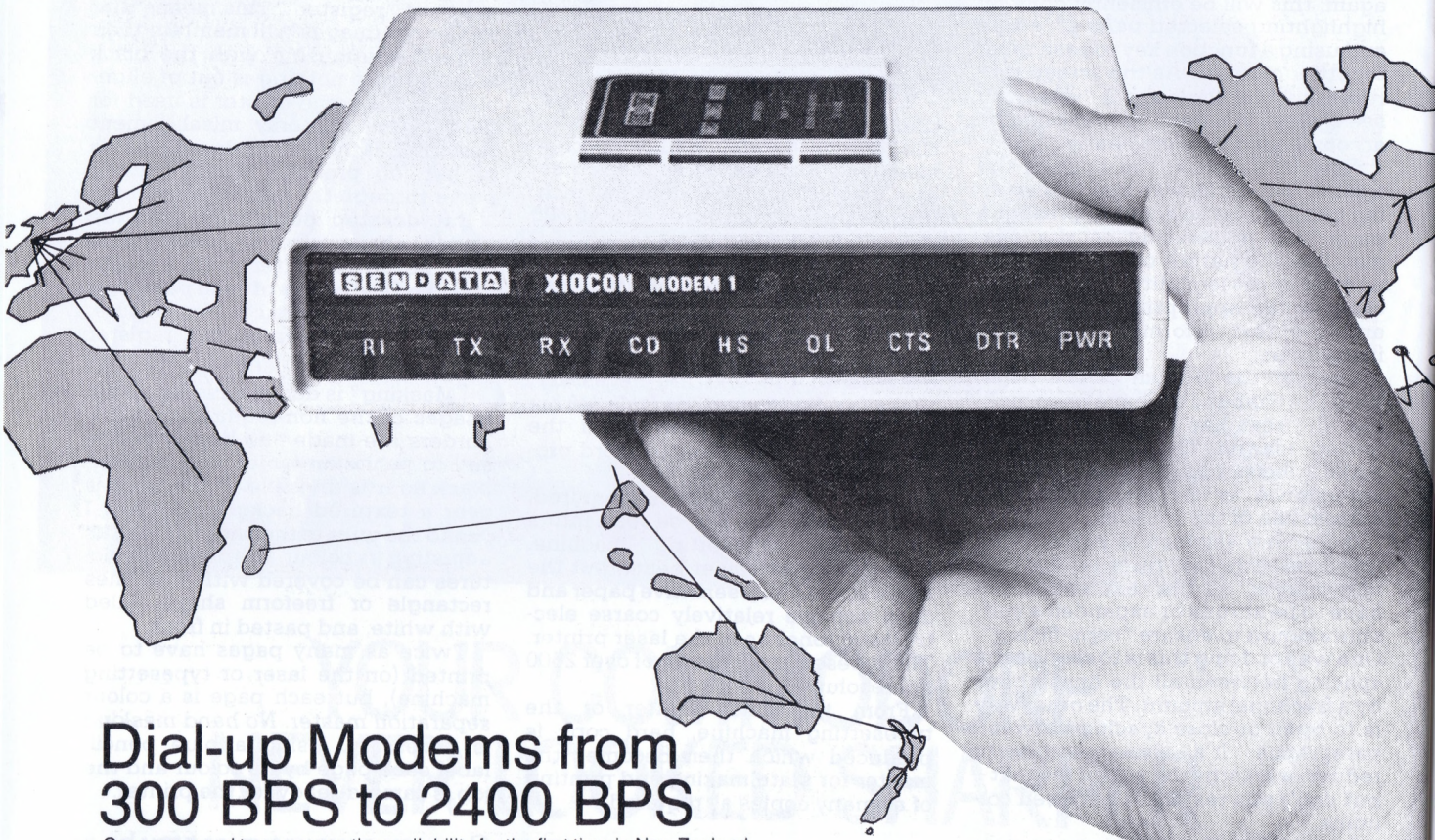

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Is this the answer?

software review by Dennis V. Lally

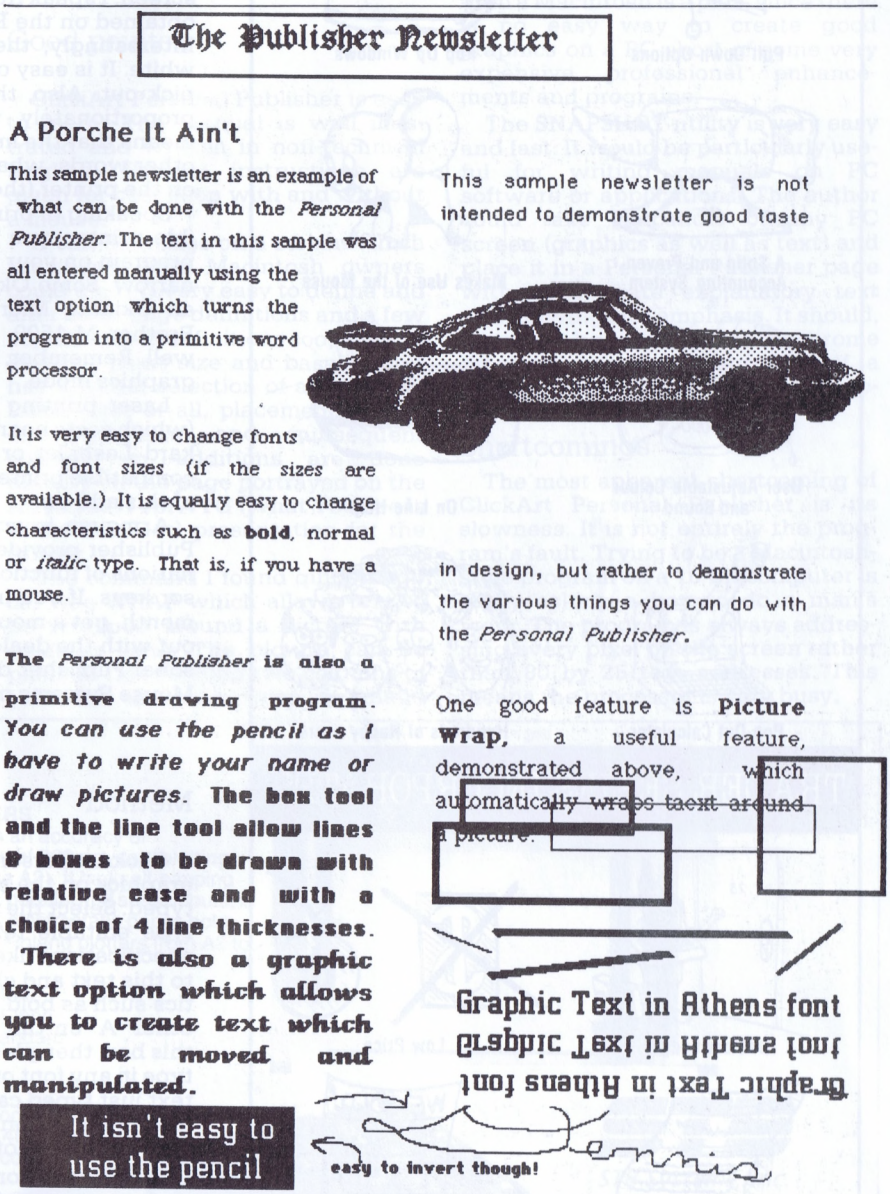
Desktop Publishing is perhaps the most exciting development in microcomputing in the last twelve months. Some people have gone so far as to say that desktop publishing will prove as revolutionary as Gutenberg's movable type. There may well be some truth in this.

Although the typewriter replaced the pen and in turn was replaced by the word processor, the improvements in typesetting and page layout have involved more expensive and technically complex apparatus such as the Linotype machine and photo page composition equipment. The advent of desktop publishing does not simply introduce greater speed and efficiency as the word processor did; in addition, it has the potential of putting the power and sophistication of a printing shop on a humble desk.

I say *potential* because only some packages come very close to handling all the typesetting procedures a professional typesetter would typically employ. Only some packages operate with remarkable ease and, what's more, are easy to learn (the envy no doubt of all apprentice typesetters). As well, only some packages provide on-screen displays which allow direct manipulation and placement of text and graphics.

Currently the Apple Macintosh is paramount among personal computers in the field of desktop publishing and the leading software on the Mac is Pagemaker by Aldus. Nothing currently on an IBM-type PC can touch the Macintosh with Pagemaker. A PC version of Pagemaker is due in 1987, and its introduction is awaited with anticipation.

That said, it's time to examine the topic of this review, which is a desktop publishing program for the IBM-type machine, but with a Mac-like screen presentation. ClickArt Personal Publisher by T/Maker Graphics costs $495 and is advertised as a "professional, cost-effective alternative to expensive and time-consuming typesetting and paste-up services."



Description

T/Maker Graphics is known in the Macintosh world for clip-art graphics and a few desk accessory programs. It is perhaps not surprising then, that for their first PC product they chose to imitate the Mac interface as far as possible. ClickArt Personal Publisher is presented in graphics mode on the screen and has the Macintosh features of pull-down menus, tool selection bar, scroll bar and mouse operation. Text and images can be selected and cut, copied or pasted and a selection of fonts can be presented in various sizes and styles.

Personal Publisher wil operate on any IBM-type PC with at least 384 Kb RAM, but I would recommend an AT as the minimum. More on that later.

Other boxes on the screen allow the creation of pencil drawings, straight lines and hollow boxes. A selection rectangle and a hand image can be used in sequence to select a graphic element and then with the hand cursor move that graphic to a new location.

The program has a disk full of illustrations. These graphics cover a wide range of topics from houses to cars to trees, etc. Some thematic pictures are included for special occasions. Interestingly, all the illustrations were originated on a Macintosh and correspond to some of the clip-art T/Maker Graphics sells for the Macintosh. These illustrations are on file with a MAC suffix. They are retrieved through the Art pull-down menu and once on the page can be moved and resized at will.

Screen displays supported are IBM Colour Card, Hercules Graphics Card and EGA (Enhanced Colour Graphics Adaptor). It's hard to say which is best. The monochrome display has the best resolution of all, but the unfortunate use of bright green as the background to dark green text means you will suffer terrible eyestrain after an hour at the screen. I speak from experience. The best colour display is obtained on the EGA screen with 128K on the EGA card. Interestingly, the colour display is in greyish black on white. It is easy on the eyes, but detail is more difficult to pick out. Also, the shape of the colour screen, which is proportionately wider than the monochrome screen, means that the image is slightly stretched horizontally. In other words, what you see will not be quite what you get on the printer (the printer will look better).

Speaking of printers, unless you have an Epson compatible printer, you had better ask your dealer to test this program on your own. The range of printers supported is narrow. Some Okidata printers are supported, but I tried an Okidata Microline 84 without success. I found the Brother M-1509, DIP switched to Epson mode, worked well. Remember, with this program all printing is done in graphics mode.

Laser printing is supported by an additional package (which costs nearly as much as the program). Hewlett Packard LaserJet or Apple LaserWriter and any PostScript compatible printer is supported by the appropriate version of this add-on.

A mouse is not necessary, but is essential! Personal Publisher provides for mouseless operation using combinations of function keys, Alt key plus another key and cursor keys. If you intend to produce more than one page a month, get a mouse. If you already have a mouse, check it out with the dealer beforehand. As with the printers, Personal Publisher does not support all mice. Microsoft and Mouse Systems mice are okay.

Method

ClickArt Personal Publisher allows you to enter text and graphics on the screen. Two forms of text can be directly typed. Select the topmost 'A' from the tool bar and you can type editable text which conforms to line and column specifications like a word processor. You can later go back to this text and change fonts, letter sizes and characteristics such as bold and underline to any text you want. The other 'A' on the tool bar represents graphic text. Select this box, then place your cursor anywhere on the page and type in any font or size available. Click your mouse and the text just typed can be moved as an element anywhere on the screen. It can be duplicated, reversed, inverted or flipped, but it cannot be edited. It is really a picture of text.

Other boxes on the screen allow the creation of pencil drawings, straight lines and hollow boxes. A selection rectangle and a hand image can be used in sequence to select a graphic element and then with the hand cursor move that graphic to a new location.

The program has a disk full of illustrations. These graphics cover a wide range of topics from houses to cars to trees, etc. Some thematic pictures are included for special occasions. Interestingly, all the illustrations were originated on a Macintosh and correspond to some of the clip-art T/Maker Graphics sells for the Macintosh. These illustrations are on file with a MAC suffix. They are retrieved through the Art pull-down menu and once on the page can be moved and resized at will.

At any time the page specifications can be set or reset through the pull-down menu under the heading 'Baselines'. Up to four columns can be set and their width nominated. Line spacing, margins and gutters (the space between columns) can also be controlled.

Text and graphics can be imported from other programs. Personal Publisher will import text from any word processor which can save text in ASCII format. There is, however, a limitation of a maximum of 5000 characters on the size of text file that can be imorted. Graphics which are in the form of clip art can be stored in two ways: as .MAC files and as .ART files (these are the DOS suffixes). A .MAC file, as mentioned before, is a page full of clip art in Apple Macintosh MacPaint format. Each .MAC file can have several illustrations on one page. The .ART files are individual illustrations usually taken from .MAC files. It is from an .ART file that an illustration is pasted into the page being worked on.

.ART files can also be created using two utilities supplied with Personal Publisher called SNAPSHOT and SNAP2ART. The first utility captures a screen image and the second program 'processes' it, allowing for adjustments such as cropping and compensating for screen scaling. These utilities are very useful since they can reputedly capture a screen from any program on a PC. The ability to translate MacPaint files could also be a boon, but no reference is made in the manual about importing MacPaint files although there are many programs on the market which allow such transfers, such as PC to Mac & Back and the communications functions of Lotus's Jazz and Symphony. Alternatively, T/Maker Graphics has several Graphics and Letters packages which can be bought to augment the original picture library and fonts selection respectively.

Good points

ClickArt Personal Publisher is easy to learn. The manual is well illustrated and written in non-technical English. Parallel instructions are given for operation with and without a mouse.

It can do things on a screen which previously only Macintosh owners could do. It is very easy to define and alter basic page definitions and a few sophisticated definitions too, such as leading, point size and baselines. It has a useful selection of a variety of fonts. Best of all, placement of text and graphics and subsequent changes or additions are done directly on the page portrayed on the screen in WYSIWYG (What You See Is What You Get) presentation for the printer.

One command I found quite magical was WRAP which allows text to be wrapped around a picture with amazing ease. The picture can be plonked right among two columns of text and then the wrap command selected from the Baselines menu. The next and final step is to select the picture by clicking on it. The computer pauses to ponder the job for 30 seconds, then the text is rearranged around the picture.

The potential to import graphics from a Macintosh is a plus, since there is no easy way to create good graphics on a PC short of some very expensive professional enhancements and programs.

The SNAPSHOT utility is very easy and fast. It would be particularly useful for writing manuals on PC software or applications. The author could take snapshots of any PC screen (graphics as well as text) and place it in a Personal Publisher page with appropriate explanatory text and drawings for emphasis. It should, however, be noted that monochrome monitors can only capture half a screen, while colour displays can capture a whole screen.

Shortcomings

The most apparent shortcoming of ClickArt Personal Publisher is its slowness. It is not entirely the program's fault. Trying to be a Macintosh-style program on a 16-bit computer is really asking a boy to do a man's work. The program is always addressing every pixel on the screen rather than 80 by 25 text addresses. This means the processor is very busy.

On an IBM XT a very poor average typist with one and a half fingers can get ahead of the machine. The word wrap on full justification is so slow, it is disconcerting. You can virtually sit and watch it being worked out! If you choose to delete or alter something the cursor turns into a little watch for 20 to 60 seconds while the computer shuffles around inside rearranging things.

Retrieving files is also time consuming, not because of the disk access time, but the period of waiting which follows while the file gets set up. However, if the screen processes seem slow, the printing must redefine the meaning of the word. Before printing just one page be sure to have a good book to read. The page shown as figure one took 24 minutes to print on an Epson-type printer!

There is a significant improvement in speed when using an IBM AT. At one stage in preparing this review, I was going to suggest nothing less than an AT for this product. However, further evaluation showed that a turbo board will speed things up on an ordinary PC by a factor of 3. It would take an 80386 processor to bring this program to Macintosh speed.

Although you can place graphic text anywhere on the page, it is sometimes very difficult to place editable text where you want it. For instance, if you want to put some imported text at the top of the second column on a two-column page and there is nothing yet in the first column, the program will persist in placing the text at the start of the first column. There are ways around such problems, but the problems shouldn't exist in the first place.

A mouse is not necessary, but is essential!

When importing text from another program, the file must not only be an ASCII format, but must also have a .TXT extension. Not all word processors will save text in pure ASCII format and even fewer will add the .TXT extension for you. I created an ASCII file using Symphony's word processor by printing the file to disk. This gave the file a .PRN extension. Then I had to exit to DOS to use the REName command to change the .PRN extension to .TXT. Only then was the file ready for importing to the Personal Publisher.

It is unfortunate that only .TXT files are recognised. It makes for unnecessary extra steps. Preparing a file for import isn't the only chore associated with importing text. Sometimes the files can come across with strange results, such as broken lines replacing continuous text.

Finally, among shortcomings, it must be stated that however Mac-like the ClickArt Personal Publisher appears it is really only a 75 per cent imitation of the Mac user interface. There are no double clicks for speedy selections, the page will not scroll up or down as you push the cursor to the top or bottom of the window, and the scroll bar is very fussy – if you move the cursor off it while holding the button down the scroll will not happen. There is no UNDO function to allow a mistaken command to be forgotten and to return to where you were beforehand. The two-stage process of choosing the selection rectangle to select an area of the page and then choosing the hand cursor to move the selected area is cumbersome. Someone acquainted with the Macintosh would see how far short this program falls in power and ease of use. Someone acquainted only with an IBM-type PC would find the Personal Publisher remarkably friendly and easy to use.

One final negative comment which is not a criticism of Personal Publisher, but rather a PC versus Mac comparison, is that mouse movement on all PC products I've seen from Autocad to Windows is inferior in control and execution to that on the Macintosh. Since mouse operated PC software requires separate mouse drivers which are loaded on top of the operating system (which itself sits on top of ROM routines), the effect is one jittery movement and cursor flashing which makes the mouse a more remote device for direct control. The result is difficulty in precise placement and losing sight of the cursor during rapid movement. Experience with the Macintosh mouse, whose drivers are in ROM, demonstrates the shortcomings of PC imitations.

Summary

The ClickArt Personal Publisher is probably the easiest to use and easiest to learn desktop publishing program you will currently find available for an IBM-type PC. It is not, however, the most capable. Although it has features that are typical of desktop publishing software, it doesn't have the grunt to do the wide range of tasks expected of a desktop publishing program. It certainly doesn't have the speed or sophistication for professional work.

Personal Publisher is really a primitive word processor and paint program – primitive word processor because it doesn't use the tab key for indents and has no tab functions; primitive paint program because it has no shading, no solid shapes, no patterns, no brushes, no magnification to pixels (fatbits) and no powerful shortcuts.

The program is not a drawing program. It uses bit-mapped graphics rather than object orientated graphics. This means that boxes and lines once placed cannot be moved or resized, only erased and redone. This limits its usefulness in page layout.

It could be called an occasional publishing program. It possesses many professional features, particularly in setting up page specifications. Through the optional add-on program it will communicate to the better known laser printers and via PostScript to certain professional typesetting machines. These features are, however, let down by awkward and sometimes impossible control of the final desired layout. By tiresome manual entry it can produce passable one or two page newsletters, but you wouldn't want to do any more than that. It could produce menus and fliers, letterheads and invitations. It will only print at one paper size, the American equivalent of A4 (standard letter size computer paper).

It should be noted that T/Maker Graphics do not sell this program for the Macintosh. My guess is that the program is not good enough for the Macintosh market which features three easier and more powerful desktop publishing programs (PageMaker, ReadySetGo and Mac-Publisher II). I wouldn't want PC users of the ClickArt Personal Publisher to think they were getting a real taste of Mac software.

On a one to five scale with five being tops, I would rate Personal Publisher a 4 for ease of learning, a 3 for ease of use, a 2 for performance and a 1 for versatility. As for value for money, well, it's rumoured that PageMaker for the PC will cost $1900 when it is released and that you'll have to have Microsoft Windows to run it (and an AT with EGA). PageMaker in its current Macintosh version costs $1300. So, $495 for a lame desktop publishing program doesn't seem too bad, except, remember, if you want laser printer quality you will have to spend nearly the same amount again. Therefore, I would rate the Personal Publisher with laser printing option pack a 1 for value for money and a 2 without the pack.

My recommendation, if you are serious about desktop publishing, is wait for the new Mac and PC versions of PageMaker to debut and then decide whether to buy a Macintosh or an IBM AT or compatible and don't worry about anything currently available for the PC. If you can't wait, make do with ClickArt Personal Publisher if you have a PC, or buy a Macintosh with the current version of PageMaker.

ClickArt Personal Publisher was provided by PC Power Ltd, Lower Hutt.

Desktop ~~Publishing~~ Typesetting

by Peter Hill

'Desktop Publishing' is a misnomer. It is difficult to see how one can 'noise abroad' or 'issue' a publication (the dictionary definitions of publishing) from a desktop, so it seems to me that if we are going to discuss the phenomenon in a meaningful way we might as well start by defining it with precision.

If we use a PC with a formatting program, all that we are doing is performing within the compass of a desktop, those activities which hitherto had to be performed by someone else, on a different kind of equipment. Thus, once we discuss the phenomenon as 'Desktop Typesetting' we may compare PC setting with the typographic industry norm – **photo**typesetting – and start to draw some useful distinctions.

The things that a phototypesetter can do are to set type in a variety of fonds (type families), and also vary letter thickness, height, slant etc. This is done in such a way that there is a fairly close "fit" between letter and letter and word and word, as compared with, for instance, the common typewriter, which has very few type families, virtually no choice of thickness, height and slant and which places letters on the page at a uniform spacing – usually 10 or 12 to the inch.

The phototypesetter accomplishes this by laying down a matrix of black dots placed together at very high levels of density, giving an impression of sharpness, clarity and intense blackness. Blackness, though, is a relative thing, for under a magnifying glass, it is possible to see the dot structure quite clearly and the edges of letters are perceived as being rough.

It is this matter of sharpness and blackness which, in 1987, distinguishes the product of phototypesetting from the product of PC typesetting which is realised by a laserwriter. Photosetters commonly resolve at densities of 1200 to 2400 dots to the inch (4000+ is available), whereas the laserwriter currently resolves at 300/inch, with talk of 400/inch being round the corner.

Let us be aware from the start, when discussing this matter, that there are, among others, two distinct types of humankind – on the one hand, people like graphic designers and typographers, and on the other, the broad mass of ordinary folk. No graphic designer or typographer will ever be able to suppress a shudder when looking at 300 dot laser resolution. They think it's unacceptable; ordinary folk, however, don't see the difference.

Two years ago we had a simple choice to make when we were considering the publication of printed matter – we either typed it or had it typeset. Now we have the choice of typing, setting it via PC on our own desktops, or having it typeset. It is the last two choices that all the fuss is over, for some managers are asking awkward questions about the cost and inconvenience of phototypesetting when they know that with the appropriate hardware and software they can be independent "and be damned to all this xyz nonsense about dots-to-the inch."

These are the basic parameter differences, but as in all things, we can look further into the subject and find out if there are things that we have come to expect of phototypesetting, which we should not expect of PC and laser setting. Kerning is one. Graphic designers just love to set letters closely together (too often they go overboard) and whilst the practice can be useful and beautiful it is difficult to do on a PC. Choice of typefaces. Most photosetters have got masses of fonts from which a designer may make a choice, but our PC and laserprinter program have very few. This can be overcome with downloadable fonts, but how many can you afford at $400-$500 a time?

How easy is it to learn to set on PC? This is dependent on a number of factors. Have you a sensitivity to and/or knowledge of type design and layout? If you haven't, then what you turn out will reflect the fact. Are you preapred to spend the time (= money) on training/gaining knowledge and expertise? If the answer is yes, *can you be sure that there is anyone who is competent and willing to give it?*

To sum up: you will be taking a qualitative step backward in print. You may spend an awful lot of time learning. You may learn that you have learned more than the people who so readily sold you the gear! You will have frustrations aplenty. You will have full control over your own deadlines and you will be able to sustain (albeit with ulcers) changes of mind about content and layout.

I am a member of a partnership which publishes a 5,000 subscriber 48-54 page quarterly magazine containing 4-colour pages. Laser resolution is found acceptable. We also are professional forms designers, who are prepared to have our discs photo resolved by a Linotron equipped bureau.

Our equipment is Mac Plus, 800K drive and Imagewriter II, together with Microsoft Word and Pagemaker. We are learning that WYS ain't WYG, either screen to Imagewriter, screen to Laserwriter, or Imagewriter to Laserwriter. We are learning how to manage those differences.

And we're glad to have gone the Disktop ***Typesetting*** way.

Virtual Memory

by Geoff McCaughan

Subject: Virtual memory

Q: What is virtual memory? How is it different to ordinary RAM and ROM?

A: Virtual memory is a technique used by some programs and operating systems to utilise disk storage as RAM. Usually this is only feasible if hard disk storage is available, but it has been done with floppies. An operating system that uses virtual memory sets aside an area of memory (say 64k) within which a number of pages are defined (say 8k each), and as each page is filled it can be copied to disk any number of times, limited only by the space on the disk.

In practice an area of paging space is set up on the disk which corresponds to the area of virtual memory. When a particular page is addressed, the operating system checks to see if the page is already in memory; if not, the least used page in memory is written to disk, and the required page is read into the vacant slot. Statistics show that any one area of computer memory is addressed relatively infrequently, and bytes grouped in memory are likely to be related, and therefore are likely to be required at the same time.

This is the rationale behind virtual memory, and why it is faster than simply storing data on disk. As can be seen, there is some processor and I/O overhead, so it is by no means as fast as true RAM. In the great majority of cases there is some processor time and disk space to spare, so virtual memory is a cheap way of obtaining an extra megabyte or three of memory.

Virtual memory was once the exclusive domain of mainframes, but with hard disks becoming much more common, and more and more PCs struggling against memory addressing barriers, I think we will be seeing much more of it.

Now that we have RAM pretending to be disk drives, and disk drives pretending to be RAM, one wonders what will come along next.

Subject: 3-inch Disks

Q: Are there any other computers apart from Amstrad which use 3-inch disks, and if so, are they available in New Zealand?

A: To the best of my knowledge the Amstrad is the only mass-market computer using 3-inch disks. There have been one or two other small systems, but certainly nothing we are likely to see here. The 3.5-inch disk now seems to be the new standard, and with companies like Apple, Atari, Commodore and IBM behind it I don't see any chance of change.

This is rather unfortunate for Amstrad users, because the 3-inch medium, being a specialised item, is likely to command premium prices unless demand reaches such proportions that the manufacturing cost drops.

Subject: Screen Dumps
System: MSX

Q: I have an MSX 728 computer and a Riteman F+ printer. How can I transfer a high resolution screen to the printer?

A: As the MSX system makes no inherent provision for a hi-res screen dump the only options are to write a program to do it yourself, or to find a commercial or public domain program to do the job.

A hi-res screen dump program is not particularly complex. One has to send the appropriate graphics commands to the printer, and then transfer the graphics information, remembering that the printer requires its bits vertically, while the computer stores them horizontally. You could write a program in BASIC to do this, but it would be painfully slow. Machine language would be much quicker, and would also be more flexible if you wished to use the screen dump in conjunction with other programs.

Nevertheless, you might find it useful to first write the program in BASIC, so that you know precisely what you are doing before getting into the machine language. Keep in mind that even in machine language the program will not be lightning fast, as the real limiting factor is the speed of your printer.

An additional complication concerns what one does about different colours. By far the best, but most complex, solution is to use different dot patterns to differentiate colours as varying shades of grey. Certainly plotting all colours as black leaves a lot to be desired.

Subject: Interfacing
Computer: Plus 4

Q: I have been using Commodore 64s for interfacing to temperature sensors and for switching various equipment through the user and control ports. I would like to use a Plus 4 for this job as they are cheaper and have more memory space available. What are the addresses of the data direction registers and ports of the Plus 4 CIA?

A: The Plus 4 certainly has the advantages you mention, but it seems to me there is a reason why they are available so cheaply. The Plus 4 has made such a poor showing on worldwide markets that there is very little in the way of software and support available for this computer. Even writing your own programs is a problem because of the almost complete lack of technical publications. Contrast this with the huge volume of information available for the C64 and it is easy to see which is better for do-it-yourself programming.

I have been unable to find out any useful information on the I/O chip used by the Plus 4 beyond the fact that it is most definitely NOT a CIA. The Plus 4 manual refers to the 'Parallel Port' but there is no indication if this is in any way equivalent to the 64 User Port. Doubtless this matter will be addressed in the Programmer's Reference Guide if one is ever published.

In the light of this lack of information I think the 64 may be a better bet, despite the higher price. Incidentally, if you want more I/O lines on the 64 you can access the cassette lines Write and Sense (E and F on the connector) through bits 3 and 4 of the 6510 data port at memory location 1. This port operates in the same manner as the CIA (the data direction register is at 0), but take care not to alter the other bits as these control memory paging.

The cassette motor line (bit 5 and pin F) is already provided with a reasonably hefty drive circuit delivering power from the 9v unregulated line. Although this looks promising, the cassette motor drive is interlocked with the sense line by the IRQ interrupt routine using location $00C0, and some fiddling would be required to get around this. If the computer was being used for a dedicated purpose it might be practical to remove all the cassette routines from the Kernal ROM and modify the IRQ routine. This has the twofold advantage of freeing up both ROM and zero page space.

Subject: Relative files
System: Commodore 64

Q: I have been trying to program relative files on the C64, but have given up as all I seem to get is NO CHANNEL or RECORD NOT FOUND, and I cannot retrieve my data from the disk.

A: It is a little difficult to tell what your problem is without seeing a listing of your program, but I can give a few clues. You mention that you have *The Anatomy of the 1541* which I

Someday your prints will come!

If you've ever had to produce printed matter, you'll know the frustrations of having to wait while someone designs it and hanging around for the typesetters to set your text. A fortnight later you may have finished art — then your printer will tell you that he's snowed under, but he'll try to fit your job in next month.

Then there's the very high cost of getting all this done — sometimes for only very small runs.

With Canon's new Desktop Publishing System, you can now do your own publishing, whether you need price lists, leaflets, presentations, training manuals, proposals, technical documents or any kind of printed forms — when you need it tomorrow, you can have it this afternoon.

If you have a computer (or are getting one shortly), and it uses MS-DOS, as most computers do, then you're more than halfway to creating your own publications.

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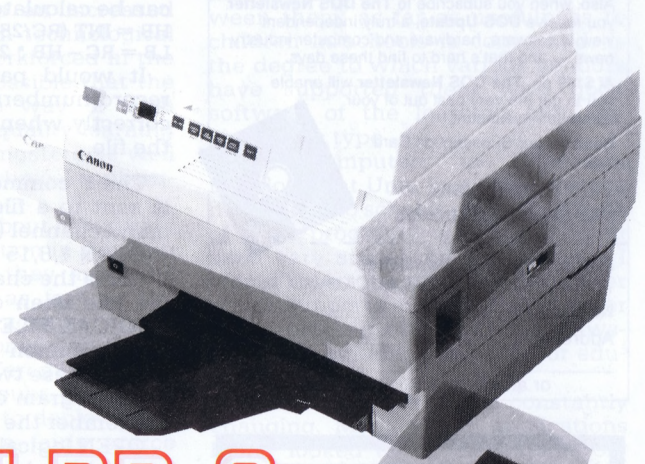

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recommend as being invaluable for serious disk programmers. The later editions are best as the first edition had a few errors and omissions.

To deal with the error messages first, NO CHANNEL indicates that an attempt has been made to open more than the allowed number of files. Only one relative file can be open at once, although a sequential file can be open at the same time as a relative file. When opening files, ensure that disk files which will be open at the same time have different channel numbers (see below). RECORD NOT FOUND indicates an attempt to read or write beyond the highest record currently on file, so in the case of a write this may not in fact be an error. It is usual when creating a relative file to write a high numbered record so that lower numbered records can be accessed without giving the RECORD NOT FOUND message.

A few points to watch are:

The record number is specified with the P command in the following manner:

```
PRINT#1,"P"+CHR$(CH)+CHR$
(LB)+CHR$(HB)+CHR$(PS)
```

where LB and HB are the low and high bytes of the record number. This can be calculated by:

```
HB = INT (RC/256):REM RC = record #
LB = RC – HB * 256
```

It would pay to check that the record numbers are being calculated correctly when writing AND reading the file.

The P command mentioned above is sent to a file opened to the command channel (15) thus:

```
OPEN 1,8,15
```

CH is the channel that the relative file has been opened to, NOT THE LOGICAL FILE NUMBER. In fact it is very common to get confused between these two and it pays to check your program carefully on this point. Remember the syntax of OPEN is:

```
OPEN logical file number, device
number, channel
```

So if your relative file had been opened as:

```
OPEN 2,8,3,"DATAFILE,L,"+
CHR$(SZ)
```

then CH would be 3 in all corresponding P commands. Note also that PS referred to above in the P command indicates the position WITHIN the record being accessed. In most cases this would be 1. SZ is the record size which is determined when the file is created and must always be specified as the same size on subsequent OPENs.

Usually a relative file would be opened and remain open as long as it is being accessed, and the command channel would be opened at the same time. Some programmers seem to delight in opening and closing files and channels for every single read and write, but this is unnecessary and clutters up your program. However, one should be sure to close ALL files before your program ends.

I hope this has been some help, although space prevents an exhaustive treatment of relative files as this can be a complex area. *The Anatomy of the 1541* does explain the subject quite well, and I would suggest that you try out the example programs in the book, as one learns faster by getting hands-on experience than by reading.

Subject: Languages

Q: I have programmed in BASIC for a number of years, but am now seriously considering going to a different language. One aspect of BASIC I am reluctant to give up is the interactive capability. Sitting around for half-an-hour waiting for a program to compile does not inspire me at all. Any ideas?

A: There are several ways around this problem, and firstly I would say that modern computers and compilers being what they are, half-hour compile times would be quite unusual. A lot of compilers are *very* quick and in these cases it seems almost as if one is using an interpreted language.

A very useful option is the availability of interpreters for a number of compiled languages, which allows a program to be developed interactively, and then compiled for run-time use.

Incremental compilers are yet another possibility, Forth and Comal both using this technique. Essentially the program is compiled as it is typed in, which means it is ready to run at a moment's notice.

A technique I use myself involves an ordinary compiled language, and another computer running an interpreted language. Besides being handy for complex calculations, the second computer is used for quick tests of algorithms before coding into the main program. I certainly don't recommend rushing out and buying a computer just for this use, but if you have an old one lying around gathering dust it might be worthwhile to give it a new lease of life.

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Resourcefulness: a prerequisite to learning

Computers in Education: Confidence and control

by the Hon C.R. Marshall, Minister of Education

Thank you for the opportunity to comment about some issues regarding the use of computers in education. I am sure that I will have much more to say on this topic following the conclusion of the exploratory studies project. The comments which I offer here, about trends in classroom computer use, educationally appropriate software and hardware and teacher training, are made with the understanding that the outcome of the studies may well alter my views.

Thinking about the use of computers in education has evolved steadily in the last few years. We are no longer sure, for example, that the most important role for computers in schools is to support the teaching of computer programming in senior secondary classes as was the vogue only a few years ago. We are no longer convinced that the best role for the computer is that of interactive tutor and/or presenter of drills.

The role of the computer as an empowering tool for learners in all disciplines, at all levels of the education system, as an extender of the physical and intellectual capabilities of the user, as a 'machine to think with', seems to be coming to the fore. This does not mean that all the things we once thought about computers in schools were wrong, but that the machine may have more educational potential than we ever dreamed.

The report of the curriculum review committee which was presented to me recently lays great stress on the need for equity of educational opportunity for all New Zealand children. In many places in the report the committee emphasises the need for the curriculum to become more learner centred, catering more for the individual needs of students.

The curriculum review document states that: "Young people need to be confident in themselves; exposed to new ideas and be able to tackle new learning; able to learn from mistakes and to solve problems in imaginative ways".

Few would argue with that as an educational goal.

There needs to be an increased supply of people with technological skills entering the workforced in the future. I think it is possible that the computer offers one way of both increasing access to quality learning opportunities for youngsters as well as increasing their technical sophistication.

One thing is clear about computers in schools. The evolution in thinking about the way that they might be best used is nearly as fast as the evolution of the machines themselves. That the computer has a place, if not many different places, in schools, I have no doubt. But what will be the best way to deploy what must inevitably be a fairly scarce resource?

The word processor as a writing tool is the example most often quoted. Briefly, it seems that if a program allows the student to take control of the computer, then it is more educationally useful than one which has the computer driving the student.

I am convinced that there is quite a large amount of such software presently available to teachers. The challenge is to find the best ways of introducing it into classrooms and to evolve suitable teaching styles to exploit it successfully. In terms of directions for further developments of software for use in schools it seems clear that most efforts should go into producing software of this kind. The Computers in Education Development Unit is presently producing some software of this kind to supplement that already from other commercial sources.

Hardware

Much has been made of the suitability or otherwise, for use in schools, of microcomputers on the market today. It could be said, in Orwellian terms, that all micros are equal, yet some are more equal than others. Most microcomputers currently available have much the same features and capabilities. The difference between them, as far as usefulness to children in schools is converned, is the degree to which various vendors have supported them with good software of the learning tool and simulation type.

The Computers in Education Development Unit, in its more recent newsletter to schools, published a list of such programs which are being used very successfully in schools. I would have to say that any computer which supports a significant number of the programs listed in that newsletter is a suitable computer for education.

The state of the play is constantly changing. Many of the applications being looked at in the exploratory studies were simply not available when micros were first used in schools.

The microcomputer is now much more obviously a powerful tool which can be used in very flexible ways. I believe it can aid teachers to create the type of environment where, in the words of the curriculum review, ".. children can be confident in themselves; are exposed to new ideas and able to tackle new learning; able to learn from mistakes and to solve problems in imaginative ways.." and importantly to provide an environment where all students can achieve significant success.

Studies

Your readers will be aware that I have initiated a series of exploratory studies in educational computing.

The aim of these studies is to provide a well researched basis for deciding on future policy directions. I am not prepared to undertake any major new policy initiatives until the results of these studies are clear. Whatever options are suggested by the studies will have to be considered too, in the light of other policies arising from the review of the curriculum.

The exploratory studies began in February 1986 and are due to finish in August this year. They are being monitored by the Department of Education's Computers in Education Development Unit and evaluated by the New Zealand Council for Educational Research. The schools which are taking part in the studies have been supplied with hardware and software. A considerable amount of teacher release time has been made available to the participating teachers, to enable them to help with the administration of the study and to familiarise themselves with the technology and the techniques of computer assisted learning.

It is my belief that the exploratory studies, as well as providing research into various potential uses of computers in schools, constitute in-service training of the very best kind for the teachers involved. I recognise, however, that other forms of teacher in-service and pre-service training are necessary for the majority of teachers who are not involved in the studies.

Supplementary grants

In the 1985 budget, I made provision for an increase in the staffing entitlement of each teachers' college for pre-service, in-service and advanced studies for teachers' courses in educational computing. Each college was given a substantial supplementary grant for educational computing equipment. Every teachers' college now offers courses in educational computing for teachers at pre-service, in-service and advanced studies levels. In-service training for teachers already in classrooms is very important if good use is to be made of equipment already in schools.

Local district in-service committees currently have the option of setting up courses for teachers in educational computing if that is one of their priorities. Many districts have already held, and have planned to offer in the near future, educational computing in-service courses. Some of your teacher readers will have attended short courses organised by local inspectorates with the Computers in Education Development Unit last year. It is planned to continue to offer such short courses this year.

A considerable amount of teacher release time has been made available to the participating teachers

Trends in classroom computer use are clearly tied to educational software development. As I have pointed out, recent experience in New Zealand, both within the exploratory studies and elsewhere, has pointed to the relative usefulness in classrooms of 'learning tool' type software and simulations, as opposed to content specific software of the tutorial or drill and practice type. By learning tool software, I mean open-ended programs that empower children to take control of aspects of their learning.

Education support

Already well-known in the education field as NZ distributors of the BBC series of micros, Barson Computers has set up a specialist division for 1987, Barson Education. John Buchanan, taking a year's leave of absence from his teaching job at an Auckland intermediate school, will be acting as education advisor and liaising with the Education Department as well as providing specialised support for schools.

John Buchanan will not be associated with sales, seeing his role as being parallel with a music advisor who visits schools with, for example, a Roland organ. "I'll be showing teachers the potential of running a micro in the classroom," he points out. "A lot of teachers need guidance in their role of how to use a computer. I'll hopefully change the way teachers use computers.

"The Department (of Education) doesn't see me as a threat. I'm looking forward to this year – it's a break from the classroom."

As Greg Magness, Barson marketing manager director explains, "I'm tired of my kids in school learning the wrong stuff. Our aim is to get kids to start using the software as proper tools and not re-invent the wheel. One of my objectives is to see every BBC in school up and running to its fullest potential."

Major fundraising project

Taking place during this month is the National Secondary Schools Fundraising Project, run by Computer Imports and culminating in a weekend entitled "We're working to Exzel" at the end of March.

The company will be supplying Exzels at cost to schools, hoping to recoup costs with sales of add-ons and software. It is also starting the project with a straight donation of $100,000 and underwriting it to the tune of $1 million, with further sponsorship from major corporations in the form of prizes and monetary grants. A trust fund, initially for the purchase of computers, will be set up by Simpson Grierson and Partners.

"The real key is that it need not cost schools anything," says Grant Hackett of Computer Imports. "If all 440 secondary schools join in they'll stand to gain, on average, two free computers each. We estimate the whole project will be worth between $6 million and $9 million, and local organisations will be asked to employ pupils to earn money for the computers."

Some 2,500 Exzels are currently in use in tertiary education centres around New Zealand, according to Computer Imports. "All secondary schools are looking for computers," Hackett points out. "Many are disappointed with what they've got, and the business community is disappointed in the level of computer literacy coming out of schools. They're using the wrong types of machines, and not being trained to use true business applications."

Exploratory studies in educational computing

by Ann Frampton,
Computers in Education Development Unit

Much interest has been shown, both here and overseas, in the exploratory studies into educational computing which began in February 1986, and are to continue until at least July 1987. At the conclusion of the 1986 school year, two-day on-site conferences were held, and some initial comments and opinions were recorded. This article briefly describes how the studies were set up, then proceeds to give some of the general outcomes that have been observed thus far.

In June 1985, the Minister of Education called through the *Education Gazette* (14 June 1985) for schools to submit suggestions for research studies into potential educational uses of computers. By the deadline the department had received over 100 submissions, making between them more than 200 distinct proposals.

In early September a conference of regional representatives and representatives of the teacher organisations considered those proposals and eventually recommended 15 major studies involving 57 schools, including kindergartens, primary, intermediate and secondary schools. Information about the exploratory studies was published in the *Education Gazette,* 3 March 1986.

In selecting the studies the conference first set for itself the task of establishing criteria under which to consider the submissions. It decided, for example, that the selected studies, when considered as a whole, should link clusters of schools across the levels of preschool, primary, and secondary schools; that they should span the traditional areas of the curriculum and take into account the multicultural element of our schools; and that they should attempt to determine any differences in computer based learning between rural and city schools, and between the genders.

The New Zealand Council for Educational Research was contracted to monitor the setting up of the research programme for the studies, and to oversee the formal evaluation of them. At the completion of the studies, the NZCER will produce a paper on each of the studies, incorporating the results of the formal measures as well as anecdotal reports from the teachers.

Conferences

Following the agreement of the Minister to the studies recommended, all of the selected schools were advised, and two-day conferences were held at the site of each study. These conferences involved the teachers concerned, an officer from the department, and a representative from NZCER. In many cases representatives from teacher resource centres and regional offices of the Department of Education were also present. The nature of the task, a timetable for the various phases,and evaluation procedures were discussed.

Some computer hardware and software were provided as outlined in the proposals after some negotiation at the two-day conferences. Decisions regarding hardware were based on the initial requests from the teachers who submitted the proposals, and so the range of equipment used in the studies reflects to some extent the range of equipoment used in New Zealand schools.

A number of the study schools used the first term of 1986 as a familiarisation phase – both for teachers and students. While there are a large number of teachers who have considerable computer expertise, most of the studies also involve teachers who have never used a computer in a class-room before. Considerable time and effort was therefore devoted to teacher training in the first term, with teachers working at weekends in the "privacy of their own home" and being released from class to work with the resource teacher to become confident computer users. The budget for the studies included a number of teacher release days as well as funds for hardware and software.

In some cases the students spent time during the first term using typing tutor programs, or other activities not directly related to the study in order to familiarise them with the keyboard, and perhaps to remove some of the effects of novelty.

Thus, by the beginning of term two, all of the studies were either underway or ready to start. There was a great deal of enthusiasm among both teachers and students which does not appear to have waned.

Interesting outcomes

Although it is obviously too early to give conclusions, as the studies are only half completed, a number of interesting outcomes have been noted. There is little statistical data available from NZCER as yet, but the teachers have all been keeping comprehensive diaries. These, together with their comments at the end of year conferences, form the basis for the following comments.

A number of studies, contrary to the opinion that some still have that the computer is a maths machine, focus on the language arts. For instance, one study focuses on oral language, and is investigating whether computer simulations and interactive fiction programs can create new and stimulating situations for group work, and encourage greater oral participation.

In most cases the computer program has become the basis for an integrated unit of work in the classroom, including activities as diverse as drama, physical education, writing, artwork and science. Primary school classrooms are often based around a theme which provides stimulus for work across the curriculum, so this was not a new approach to the children.

The teachers in this study believe that the students have become more self-confident, and that their self-esteem has improved. This appears to have transferred not only to other classroom situations, but also to their behaviour in the playground. Some teachers have noted that the students are more able to discuss, negotiate, and put forward good arguments in class and group discussions.

Several of the studies have focused on the major application of the computer in New Zealand primary school classrooms today – that of using a word processor as a tool in the writing process. Does the ease of editing on the computer encourage children to edit more and therefore produce better quality writing? Does the use of a word processor improve students' attitudes towards writing? What effect does the availability of a spelling checker have on students' spelling ability? These are the types of issues that are being investigated in these studies.

Variety

One of the studies involves large city schools, another small rural schools, and yet another an area school. The ratio of students per computer varies considerably, and this was a problem initially as children had to learn at least rudimentary keyboard skills before they could concentrate on their writing, rather than

the mechanics of the word processing.

However, this was a temporary problem – even for the five-year-olds who are involved in the one- and two-teacher schools in the rural study. Teachers now report that because there is no need to rewrite correct material as happens with pen and paper writing, most children can produce a final, edited version of a piece of writing much more quickly on the word processor than with pen and paper.

Another study aimed to put a computer in every classroom of the school, with the teachers being free to use the computer in any area of the curriculum and to try out any kind of software. The two main objectives here were to document the time teachers spent in reviewing software and planning and preparing activities for the computer, and to examine the boy/girl preference for software.

At the end of the first year the teachers felt that their main discovery was "open-ended" software. As one teacher said, "When I discovered open-ended software I knew that the computer had a place in my classroom." They feel that they made a mistake in buying a large number of software packages which they did not really have time to review, when in fact they now believe that it is much more effective and useful to have a thorough grasp of two open-ended packages.

Another study is using branching story software to investigate group interaction. Groups of different sizes, sometimes self-chosen and sometimes teacher-chosen, work together to create a computer version of a branching story book. Other studies, too, have experimented with the size of groups, and selection methods. It seems that, in general, having the students select their own groups leads to fewer confrontations and more co-operation and productive work.

Communication

One study has linked schools from Southland to Poverty Bay via modems and the telephone lines. Students are using database programs and word processors to collect and record information on a range of topics from the Commonwealth Games to their own fitness, and share this information with the other schools involved. A spin-off of this has been contacts made with other children in Australia and the United Kingdom, and hence a much wider sharing of information and ideas.

Another spin-off has been for deaf children, who with modems can communicate with hearing children, via the telephone, for the first time. The computer does not distinguish between a "normal" student and one with some sort of disability, and so the studies involving special education are proving to be extremely successful.

Besides providing a much-needed boost in terms of teacher training, the studies have become a focal point for interest in computers in education within each district. In many cases the teachers have become very involved with their local Computer Education Societies and have become resource people within their areas. They have given much assistance to other teachers who are considering the purchase or have recently bought a computer for their school.

It has been hard work for the teachers involved, but in general they believe that the benefits in terms of output, motivation and the development of skills that they have seen in their students have made it well worthwhile. Undoubtedly 1987 will bring even more interesting outcomes as the teachers involved are so much more familiar with the computers and the role that they play in the studies. It will be a busy and exciting year for all those involved.

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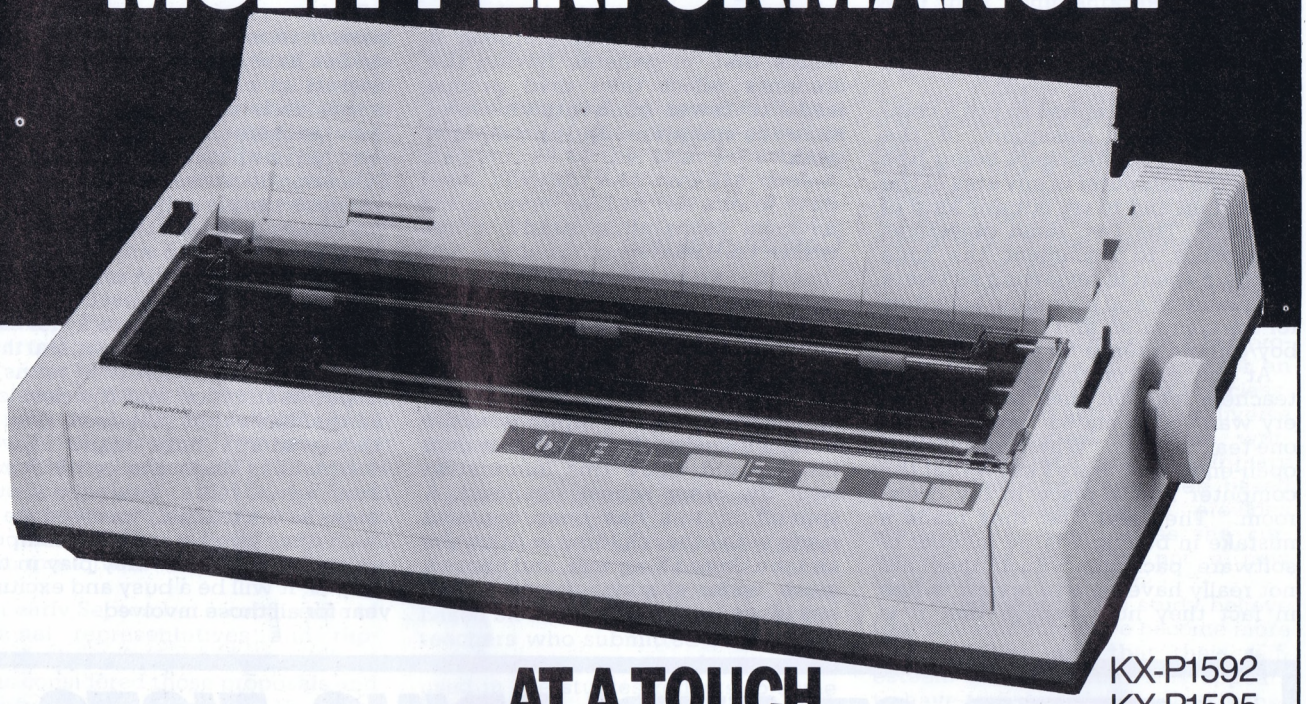

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Of Politics, Salesmen and Making things Happen

by Pip Forer

Towards the dead end of last year we explored the Slough of Despond: the state of educational computing in New Zealand. Perhaps in a new year the time is ripe to look on the bright side and consider the positive steps that could enhance the use of computers in New Zealand education.

Gerrit Bahlman, the foundation president of the New Zealand Computer Education Society, always argued strongly that educational computing stood on a three-legged stool, the legs being software, hardware and training-plus-support. Go short on any one and you balance uncomforably, but remove one altogether and your position is easily imagined. It may help to look at each of these legs in turn.

While each one represents needs that must be met, the key leg for the long-term appropriate use of computers must surely be training or, in its widest sense, positive personnel support. One key to this is training in depth: training in what is available technologically and what is effective educationally; training in a broad perspective and in the chalkface details of useful applications; training of the women and men in senior positions and at one-teacher schools.

The other key is positive support for those teachers innovating and experimenting with new technology. Key innovators need to be encouraged throughout the system, not just where they are lucky enough to have a sympathetic principal. Valuable contributions should be given worth by appropriate career recognition.

In terms of hardware, teachers need to know that there is an assured future for the applications of new technology that they develop. That is to say that computer hardware should be recognised as a basic requirement of any school and levels of appropriate support decided upon. There will never be money for enough of the latest machines across the entire school system, but hardware needs demand funding recognition. Computers need to be more than the gymnasia of the 1980s, vital but dispensable.

In terms of software, what is needed are effective programs and languages with effective support material. Perhaps it isn't feasible to develop large numbers of programs tailored to NZ conditions across a range of machines, but an ongoing monitoring of offerings on major machine types, and the provision of support material for key general purpose languages and utilities, should be attainable.

In New Zealand some progress has been made in these areas: more 'dedicated' staffing at teachers' colleges, some university appointments in the area, growing opportunities for elementary training in using computers in different roles. But why have we not achieved more?

The obvious answer is resources: there is limited cash for education and other very legitimate new developments contending for money within the education vote. With some 3000 schools in New Zealand the costs of universal and equitable provision of hardware and software at anything like reasonable levels pose problems.

The natural bureaucratic temptation is to avoid the issue and leave it to individuals and schools to make their own headway. This will mean limited facilities in education and thus limited use, slower introduction of new practices and often restriction of use to a few, influential subject areas. This depressed level of use can then be cited as indicating only limited demand, and be used to justify further inaction. It is a common ploy in tertiary education for avoiding adequate computer support. The unique achievement in schools is doing the same thing on an almost zero budget!

More money would clearly be useful. Skilled teachers with innovative ideas in computer education could then be given more development support and professional recognition. Training could be improved and minimum hardware levels guaranteed. The effectiveness of current structures could be improved.

If you doubt the latter then consider how software is currently evaluated and distributed. At present evaluations are done through the computer support unit in the Department of Education but are slow to emerge and not easily accessible when needed. In addition any new software distribution through existing publication channels takes (literally?) years. A simple modem in each school and a public access database and bulletin board would do so much to break both of these bottlenecks at relatively low cost.

However, lack of resources is not the only problem. Institutional constraints are also significant, and problems of a relatively static and ageing workforce are one component. Problems of coping with other important educational changes are another. Perhaps greatest is the slowness of response of many educational bureaucracies, especially those that define curricula and syllabi.

While the importance of a centrally defined curriculum in determining what is done in the classroom is declining, nonetheless goals and

objectives are often slow to adapt to appreciate and incorporate new technology. This clearly varies across subjects. I discovered to my delight the other day that creative video production is an optional feature of the high school English curriculum. A shame that information and computing technology is not likewise recognised, say in stronger computing studies prescriptions (or in interactive fiction in English perhaps).

These needs and constraints are not unique to New Zealand, but have been encountered elsewhere. Is there some model for encouraging change? In particular, is it cost effective? New Zealand has unique needs and resources. Is there a path that makes use of these to encourage a wider and positive use of computing and new technology in education?

A starting place might be to look at some overseas programs that were aimed at encouraging and sustaining innovation. There is now a fairly wide experience overseas, from grand, national schemes to small-scale initiatives located in a particular city. Here are a few suggestions on some common features of the successful ones:

- They recognised the width of applications of computing technology in education and planned accordingly.
- They recognised the need for a central focus for new developments: a well-funded and named initiative that could gather support and carry conviction.
- They utilised all resources available, both within the school sector and outside. The skills and independence this brought were highly significant in eroding inertia and opening horizons.
- They worked with a considerable degree of autonomy from existing education structures, but retained strong links with them.
- They utilised a limited range of machines, but not a single type.
- They enjoyed reasonable levels of funding.
- They distringuished between three components: the ongoing needs of educational support and training, the long-term needs of research and short-term needs for 'barrier-breaking' activity. The 'barrier-braking' was seen as a 3-6 year phase aimed both at raising public recognition of new technology and putting in place the structures needed to ensure the long-term health of the other two components.

There have also been some common failings, particularly in translating ideas into chalkface practice and in providing adequate research on the costs and benefits of educational computing. In some countries commercial pressures have been quite apparent in determining the scope and specifics of educational developments, either pursuing too much too soon or restricting developments to local manufacturers. Projects which sought to develop specific initaitives and carry the burden of general teacher retraining have frequently had problems doing both. However there is no doubt that without their various national initiatives, computing technology would have been less successfully integrated in the various countries.

What is the best support model?

Which brings us to New Zealand's need to catalyse developments in educational computing. Do we need a sweeping national umbrella scheme like MEP in the UK or the ambitious Dutch scheme? Is there a need for strong subject-oriented initiatives? Would centralised support centres such as the Queen Elizabeth centre in Tasmania or Angle Park in South Australia solve most of our problems? How about the distributed, college-based centres of expertise like ITMA MUSE in the United Kingdom? Do we look to high-profile approaches such as France's work at the Centre Mondiale or lower profile institutions such as the UK's Council for Educational Technology?

A working party of the New Zealand Computer Education Society has been considering our local needs and has recently completed its work. It points to the need to mobilise resources to provide a variety of cost-effective initiatives and support structure in the computer education field. These include issues such as the organised assessment and development of programs and provision of training and support.

A need is also seen for more professional acquisition of hardware: more positive guidance in assessing and purchasing equipment. Choosing and buying appropriate equipment is a problem even for large schools, and a nightmare for many small primary ones. It is clear that the kind of tightly integrated hardware and training packages common to purchases by business organisations are not directly applicable in education at present.

A centralised, single-model, national tender has many dangers (and is impractical while schools fund their own equipment). However, some form of additional guidance to schools is needed (the attendance at computer education society meetings on machine purchase is testimony to this). A national purchasing scheme also might well offer benefits. Given that we have very little involvement with manufacture of computers ourselves, we certainly need to beware of the 'push the hardware' brigade. Our aim must be to get used to appropriate hardware and use it to maximum effect. Greater support in computer acquisition would help in this.

Perhaps the main requirement that the NZCES proposal sees is the need to instil a greater appreciation of new educational technologies, through research and specific national projects. Projects to involve teachers and get enthusiasm and training underway in specific areas could be invaluable in raising, rather than lowering and leaching out, the enthusiasm of educators for change. Obvious candidates for such projects include developments in Logo, Information Technology, telecomms, small scale publishing and common databases.

How do you achieve this? The NZCES proposal envisages a small, independent directorate with primary responsibility for catalysing developments in educational computing through special initiatives and research. Such a directorate would tap the support and resources of the computer industry and combine the resources of the private and public sectors. It would have a sunset clause, to self-destruct once the need for national initiatives was past. NZCES suggests that funding for the directorate might come equally from the private and public sectors, the private sector contributing via a one per cent training levy on all imported computer equipment.

As an office-holder in NZCES I have a reason to support the ideas of the working party. From a personal perspective I also find them appealing. For my money the most cost-effective institution in the general field of microcomputers and educational technology has been the Council for Educational Technology in London. Its brief has been wide enough to embrace the changing mixtures of technology as time has passed. Many of its reports and projects have been seminal and have resulted in far more widely known major projects. Like the NZCES proposal it is itself a small permanent establishment, boosted by short-term associates as projects come and go.

NZCES has already started to circulate its ideas among educators and politicians. If you support action in this area I am sure NZCES would like your help. Join your local Computer Education Society (if you are not a member already). Ask your MP how he or she feels about information technology in education. Best of all, come to the national conference in Christchurch in August 1987 and help debate the state of computers in New Zealand education.

The microcomputer and the curriculum

by John Buchanan

There can be no doubt that most children enjoy working with computers. Fears that this fascination results from novelty have not been realised in schools which have been using microcomputers for a number of years now. They have proved that the micro can produce a valuable stimulus for the pupil who is poorly motivated, and makes much of the more traditional curriculum enjoyable.

This then raises the old chicken and egg syndrome. What comes first, the computer or the curriculum? In my opinion the curriculum must be central, not the micro. Teachers must ask themselves, "What can a computer do for my school, my pupils and my teaching strategies?"

The strength of the micro in the classroom lies in four main areas.

First, it can provide a novel approach to liven up the traditional curriculum, making teaching and learning a more enjoyable experience. Second, it allows teachers and pupils to do things which would not be possible in the normal classroom environment. Third, it can extend the curriculum into the little-explored fields of problem solving and logical reasoning. Last of all (but probably the most widespread) is the use made in our schools of the microcomputer to aid children in the writing process.

Let's deal with these four areas in order.

There are a great number of programs around which allow children to practise their spelling, mathematical tables and grammar. These vary a great deal in quality. Readily available and sometimes free are programs that are no more than electronic cards that flash up tables combinations or spelling words onto the screen and expect the correct answer. If the child is wrong it moves onto the next question without so much as a second chance or an explanation of how to do the given example.

These programs often have a preset selection of tables or words that the teacher has no control over. I well remember being shown a spelling program with over 2,000 words to be tested in groups of 20. The computer would remember each child's score and print it out at the end. When I questioned the teacher as to the relevance of the words the child was spelling, I was faced with a blank face and an explanation, "Well that didn't matter – it was good practice for them!!"

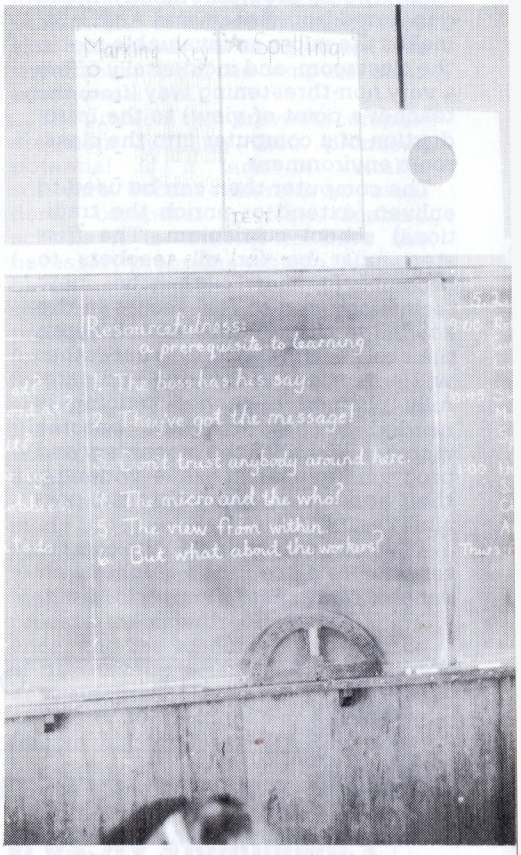
Thankfully we have moved away from those sorts of programs into a much more open style of drill and practice routine where the teacher can set up the information to be practised and also set the level for each child. The better programs can do much more than this. One example is a game which allows the pupils to write and solve their own subtraction problems. In addition, there are various strategies incorporated in the game which have to be worked out. Thus a simple practice exercise can be built into something which requires quite a lot of mathematical thinking.

The second sort of program allows the teacher to place the child in an environment controlled by the computer. In real life applications the best known of these would be the flight simulator used to train commercial pilots. The simulator takes the place of the real aeroplane and allows the pilot to practise various manoeuvres and learn how to handle the plane without any risk to the pilot or to the aeroplane.

At the micro level there are several variations of the same type of program for most computers, only constructed in a much simpler way. Educational software writers have developed this theme into programs where the children can simulate the experiment of finding suitable conditions for a plant to grow, or of a pond to explore. There are several exciting programs where groups of children have to survive on an island or in a strange world or in outer space. How do these fit into the classroom?

They fit in several ways. They can provide the children with a chance to explore their own ideas in a safe way. Rather than being told what a plant needs to grow and flourish, the children can experiment with the variables built into the programs until they come up with the correct ingredients for the growth of the plant. If they have kept an accurate track of all their experiment they will then have an interesting record of trial and error and decision making. They will be able to transfer this knowledge into the real world just as the pilot transfers his knowledge and skill gained on the simulator into real life applications. The programs can also provide a great stimulus for language in the classroom.

One such program, Dragon World, takes the form of a two-part adventure into a world where dragons are friendly. The software is colourful and challenging to most children. The work that can evolve from just this one program is tremendous. From a teaching point of view the idea of organising your class so that several children are using the computer at once to work through part of the adventure each day with all the discussion and decision making that it involves, then writing about their work and their adventure as part of their daily writing programme is exciting.



Follow that up with an exploration at reading time on the place of dragons in history, taniwha, Chinese dragons, St George and the Dragon, Welsh dragons and dragon stories from all over the world, and your reading programme comes alive. Art work simply flows from the children when they are asked to design their own dragon, make a dragon out of junk or paint a giant mural of their impressions of Dragonworld.

Research is not left out either, as investigations can be made about probability as it comes up in the prog-

ram. (By the way, is it true to say that nothing is impossible? Try striking a match on jelly!!) The program leads the teacher and the class into all areas of the curriculum including dance, drama, music, mathematics, logic, physical education and science, all related to what the teacher would normally be doing in the classroom. This type of program, mostly being generated from Britain and Australia, makes the micro an invaluable tool in the classroom, and incidentally offers a very non-threatening way (from the teacher's point of view) to the introduction of a computer into the classroom environment.

The computer then can be used to enliven, extend or enrich the traditional school curriculum. The first step must be for all teachers to become familiar with the new technology and to feel secure in the kowledge that it does not threaten their role in the classroom, but rather will enhance it. Extensive and carefully planned in-service training is needed to help teachers become more familiar with the machinery and programs available, while widening their horizons to appreciate the possibilities.

Then and only then will the computer take its place in the teacher's arsenal of strategies to support the current curriculum.

The third aspect is the use to develop thinking skills and logical reasoning, and in the forefront of this must be the use made of Logo in our schools. Logo, which comes from the Greek word Logos (word or thought), is a programming language evolved along the discovery learning philosophy based on Jean Piaget's theory. This theory is based on the premise that children learn by doing. In the case of Logo the children acquire thinking skills and new information by giving the computer instructions.

The Logo language has three basic components. These are Turtle graphics, arithmetic, and the ability to manipulate words and lists. The turtle graphics aspect is the part most widely in use in our schools.

With turtle graphics the child has the ability to manipulate around the screen (and also on the floor) a "turtle". By giving it commands such as Forward 100, the turtle moves forward the approriate amount. The beauty of the language is that it is procedural in nature, thus allowing problems to be broken down into small bits or procedures. These can then be used as building blocks to create an interesting graphics display.

By far the fastest growing application in schools is the use of the microcomputer as a writing tool for children to publish their own written language. The stimulus this use of the computer makes to the writing programme can be marked. Children like the idea of being able to manipulate text and to print it out in an easily readable form. As a pupil who suffered from the trauma of poor handwriting and having to repeat my work several times to get it correct, I can easily identify with the children who, once they have access to a microcomputer, actually enjoy the writing process. The thrill of being able to print out one for the teacher, one for yourself and one (if the teacher allows) for Mum and Dad at home, is incentive enough to get the children writing.

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EDUCATION FEATURE
The view from within

A user's viewpoint

by James Palmer

One of the first things a budding young computer programmer learns is that if you take all the microchips out of a computer, lay them out end to end on a table, and measure them, you will have virtually no chance of getting the computer to go again, or of ever being allowed back into the computer room! No one said that learning about computers was going to be easy.

The first time most students come across computers in the classroom is at their high school. Although some primary and intermediate schools have used computers successfully, this is normally because a motivated teacher has made a computer available and knows how to make good use of it.

This year I am in the seventh form at a Dunedin high school. Having learnt BASIC before going there I was already "computer literate", but apart from a short computer awareness course, my only contact with the school's computers during the third and fourth form was a small computer room with three Apples. And as far as I knew, those were used almost exclusively for games over the lunch hour.

Again the fifth form didn't really provide a chance to use the computers during school time – the fifth form maths syllabus doesn't include any computing and there wasn't any software being used that related to any of my other subjects. The school had, however, been more active with the computers than I had and when I started the sixth form a handful of Apples had been transformed into 16 BBCs.

Since last year all sixth form subjects have been internally assessed. This gives schools the chance to design their own courses, and so was born "computer maths and statistics". This sixth form subject combined computer programming with basic seventh form statistics. It was well taught and in a short time the whole class had picked up a good knowledge of BASIC programming and general computer logic. Other sixth form subjects were able to make limited use of the school's computers. For instance the accounting classes used the computers for revision exercises and a simulation of television sales, as well as looking at the way computers can assist accountants in business.

This year, however, as a seventh former, the maths with statistics course will probably be my only, somewhat limited, chance to use the computers at school.

Unfortunately computer rooms have become the pirate ships of the 1980s. Software piracy, usually of games, occurs all the time in schools throughout New Zealand. Whether it could ever be totally stopped is debatable, but it is clear that unless a firm stand is made by schools it will continue unchecked.

High schools don't need to produce computer programmers in bulk. They do, however, need to develop computer literacy. Only a small percentage of the population will ever need to program a computer, but already many people are regularly using computers of some description. A broad understanding of computers, their capabilities and limitations are the most important bits of knowledge that people need, and we must be able to use computers as the tools that they are.

I feel that much more use can and should be made of computers outside the maths syllabus. Following a colourful and animated computer tutorial is much more interesting than a bland textbook. Computers have the very powerful ability of simulating real events – from chemical reactions to the effect of political decisions on a foreign economy. They are infinitely patient and excellent at asking revision questions. In short, more use should be made of the computer as an educational tool.

The problem that prevents computers from fulfilling their promised potential is a lack of suitable software. Because there is no "standard" computer in New Zealand schools it is difficult to have the necessary programs written. A possible industry has been stifled because software developers would have to produce versions of their programs for five or six very different computers to have substantial sales. Similarly, schools can't share resources unless they have the same computers which, at least in Dunedin, is not very common.

In the future more use should be made of "in school" talent. All of the programs suggested earlier are within the capabilities of the best high school programmers. This would provide them with excellent experience, and the school with a resource of useful programs. I can't help but imagine the effect of having the same computer in all schools on the creation of a large base of educational programs that could be shared between schools.

In summary, from my experience I don't feel that computers have yet found their niche in our schools. A lack of suitable software and the proliferation of different types of computers have impeded their use in different subjects. However, if suitable software can be found or written, computers may at last become the educational tools that they are most suited to being.

EDUCATION FEATURE
But what about the workers?

Never mind the pupils–what about the workers?

by John King

Everybody seems to agree that computers are a most necessary education tool, and that school pupils should have ready access to them to develop the computer literacy needed in modern life. But what about the schools themselves, those great big businesses still being run along traditional lines with scarcely a thought given to the capabilities of those very same machines being provided for their pupils?

Today's high school is indeed a big business, with a turnover often exceeding $1 million without having to take into account such things as teachers' salaries. The modern microcomputer can easily cope with the administration needs of such an orgnisation which, although it shares many of the accounting and office functions of the usual business, also has a number of unique requirements.

Gone are the days when a business can expect to function efficiently by shuffling pieces of paper around. People who make decisions expect to have up-to-date figures and trend reports in front of them, and while a

Someding to think about

by Joe Colquitt

From time to time, disks have accidents and, unhappily, these sometimes render a part of the disk unusable. If a disk receives a ding, the head can't store or retrieve information on that portion of the disk. When this happens to a section of the disk containing data, either file or program, then in most cases it's box city for that data (and that on side two as well). Some recovery may be possible with a sector editor, but the area with the scratch/mark/ding will not generally be retrievable.

On the other hand, the damage may occur on a part of the disk's surface that is so far unused, not depriving you of saved information, but making future use of the affected tracks and sectors decidely dodgy.

On the other other hand, if damage happens to the directory track (18), there's a good chance you'll have to give your disk the big E. Further comment on this after an explanation of the programs.

Error Analyser (displays status of disk tracks and sectors)

Line 20 Read error message data

Lines 90-160 Initialise disk, select mode

Lines 170-270 Read 'blocks per track' data. Send a READ signal to drive, and get message generated from location $00 in buffer 0.

Lines 280-310 Print status, loop and return to selection

Lines 320-440 Loop through 44 tracks, getting error messages as for selection 1.

Once you've found the error areas, what do you do about it? If the damage is extensive, the disk may need to be scrapped. When only a track or two is affected, then the area should be write-protected.

Probably the most convenient way to do this is to uplift any files of importance off the disk and transfer them to a new disk, leaving the damaged disk free to have a new BAM written. Files that won't copy will likely have a bad block as part of their data. Whether the file is worth a lot of effort to recover is at your discretion.

Having transferred your files, send the following command to clear the BAM and directory:

OPEN15,8,15,"N0:disk name":
CLOSE15

If it turns out that the directory track is NBG, then a new directory track will have to be allocated. This is, however, not a satisfactory solution, the time involved being vastly disproportionate to the advantage of being able to use the disk.

As mentioned in previous articles, track 18 sector 0 keeps an account of what tracks and sectors have been used for data storage by setting a bit in T18/0. Further information on this can be found in the User Manual.

Program 1: error analyser

```
20  DIME$(11):FORI=1TO11:READE$(I):NEXT
30  DATA"OK","NO HEADER","NO SYNC","DATA
    BLOCK MISSING"
40  DATA"CHECKSUM","BYTE DECODE","WRITE
    VERIFY"
50  DATA"WRITE PROTECT","HEADER CHECKSUM"
60  DATA"LONG BLOCK","ID MISMATCH"
65  rem blocks per track data
70  DATA1,17,0,20,18,24,0,18,25,30
80  DATA0,17,31,35,0,16,36,44,0,15
90  PRINT"[clr]INSERT DISK, PRESS A KEY"
100 POKE198,0:WAIT198,1:POKE198,0
110 GOSUB490
120 PRINT"[clr]1.RECORD DISK ERRORS
130 PRINT"2.LOG UNFORMATTED TRACKS"
140 GETA$:IFA$=""THEN140
150 A=VAL(A$):PRINT"[clr]";:ONAGOTO170,320
160 GOTO120
170 FORI=1TO5:READT1,T2,S1,S2
180 FORTC=T1TOT2:PRINT:FORSC=S1TOS2
190 OPEN15,8,15:CT=0
200 PRINT#15,"M-W"CHR$(6)CHR$(0)CHR$(1)
    CHR$(TC):rem set pointer to $06,07
210 PRINT#15,"M-W"CHR$(7)CHR$(0)CHR$(1)
    CHR$(SC):rem in buffer 0
220 PRINT#15,"M-W"CHR$(0)CHR$(0)CHR$(1)
    CHR$(128):rem send READ command
230 PRINT#15,"M-R"CHR$(0)CHR$(0):GET#15
    ,A$:rem get error number
240 N=ASC(A$+CHR$(0)):IFN>127THEN230
250 IFN=1THEN270:rem N holds error #
260 CT=CT+1:IFCT<>3THEN200
270 CLOSE15
280 PRINT"TRACK"TC;TAB(5)"SECTOR"SC;
290 PRINTTAB(19)E$(N)
300 IFN=1THEN430
310 GOSUB450:GOTO430
320 FORI=1TO44:OPEN15,8,15:IFI=23THEN
    PRINT"S";
330 PRINT#15,"M-W"CHR$(6)CHR$(0)CHR$(1)
    CHR$(I)
340 PRINT#15,"M-W"CHR$(7)CHR$(0)CHR$(1)
    CHR$(0)
350 PRINT#15,"M-W"CHR$(0)CHR$(0)CHR$(1)
    CHR$(128)
360 PRINT#15,"M-R"CHR$(0)CHR$(0):GET#15
    ,A$
370 N=ASC(A$+CHR$(0)):IFN>127THEN360
380 CLOSE15
390 E$="SYNC FOUND "
400 IFN=3THENE$="UNFORMATTED "
410 PRINT"TRACK "I;TAB(12)E$;E$(N)
420 NEXT:GOSUB450:GOSUB490:GOTO90
430 NEXT:NEXT:NEXT
440 GOSUB450:GOTO90
450 PRINT"KEY TO CONTINUE"
460 GETA$:IFA$=""THEN460
470 PRINT"[up]35spaces[up]
480 RETURN
490 OPEN15,8,15,"I0":CLOSE15:RETURN
```

Program 2: block allocator

```
0 PRINT"[clr]INSERT DISK, PRESS A KEY"
5 POKE198,0:WAIT198,1:POKE198,0
10 OPEN15,8,15,"I0":CLOSE15:PRINT"[clr]"
15 PRINT"TRACKS  1-17 SECTORS 0-20"
20 PRINT"TRACKS 18-24 SECTORS 0-18"
25 PRINT"TRACKS 25-30 SECTORS 0-17"
30 PRINT"TRACKS 31-35 SECTORS 0-15"
35 PRINT:PRINT:OPEN1,8,15
40 INPUT"TRACK";T
45 PRINT:IFT=0THEN95
50 INPUT"SECTORS";S1,S2
55 PRINT:FORS=S1TOS2
60 PRINT#1,"B-A 0";T;S
65 INPUT#1,A,S$,D,F
70 PRINTA;S$;D;F
75 NEXT
80 PRINT:PRINT"ANY KEY"
85 GETA$:IFA$=""THEN85
90 RUN
95 CLOSE1
```

After NEWing the disk, load-run Error Analyser, select option 1, and make a note of damaged areas. A ding 3mm long will probably affect two adjacent tracks.

To write-protect a sector, you need to use the Block Allocation command. This allows individual sectors to have their bits set in BAM, which tells the DOS they are reserved.

Program 2 follows the syntax recommended for allocating blocks. Where damage to the disk is concerned, it's probably prudent to allocate the whole track. Although the Error Analyser may not show a block as being damaged, if it's next to one that is, then it may have sustained impairment not detectable by a simple error test. I've noticed that on the older 1541s, B-A may allocate the whole track sometimes instead of only one block of the track. It's a nuisance, but it's not generally a problem.

A way around this, if it happens, would be to use the Block Free command, and free some blocks. The syntax for B-F is exactly the same as for B-A, ie specify the track and sector.

I hope that someone, somewhere, has benefited from this. I know it's saved me a few dollars.

If you would like some disk utilities, drop me a disk and return postage. Joe Colquitt, 6 Martin Ave, Mt Albert, Auckland.

Help requested

Dear Sir,

A group of disabled friends of mine asked if I could make an infra-red remote keyboard for a Commodore 64, for obvious reasons.

I've tried a few experiments but without success, and somehow I feel that I am approaching the project from the wrong tack. Perhaps some of your readers have some suggestions and circuit ideas.

This is a particularly attractive project since it means that more than one keyboard can simultaneously use the same computer and program. The criteria are to be able to run all software.

Jim Clark,
65 George St,
Ashburton.

Evolution of graphics boards

by Bennie Gunn

The early answer to the provision of text and graphics on the IBM PC was that provided by IBM itself – the mono display was ideal for word processing and spreadsheets because of its clarity, yet it possessed no graphics capability. The colour graphics (CGA) provided both graphics and colour but with such poor resolution that text was hard to read, and graphic images used for CAD applications were virtually unusable.

These warts-and-all solutions, despite their drawbacks, were widely supported and are still so today. Mono text and CGA boards and associated monitors are at the bottom end of the price range, and allow the user to dispense with them during subsequent inevitable up-grades without great economic penalty.

Many non-compatible standards

The drawbacks of the early board were partly solved by Hercules, whose board combined text and graphics at a resolution of 720 x 348. This card attracted much software support, especially in CAD, and became an industry standard in the medium price range. Widespread copying from Asian sources has since pushed the price well down.

Another standard of sorts emerged from Tseng Labs, with a new display mode which allowed users to achieve 132 columns on the screen – ideal for spreadsheets and terminal emulation. This attracted some support in the high end of the market.

The desire for high resolution in colour led to the emergence of 720 x 400-line video as yet another standard. The more extensive pallette and crisper resolution have made such cards as the STB Super-Res 400 popular for CAD/CAM, hi-res graphics and desk-top publishing. Both the 400-line card and its associated monitor are at the high end of the market.

Another standard introduced by IBM in late 1984 is the Enhanced Graphics Adapter (EGA). Intended by IBM to be merely a higher-priced alternative to their CGA, its 640 x 350 line resolution was embraced by software manufacturers as the answer to the deficiencies of CGA, and it has appeared as an option on very many software packages. While most EGA cards require a special 350-line monitor, there is one card from STB, the EGA Multi-Res, which will drive any monitor whether mono or colour, including very-hi-res multi-sync monitors. EGA cards and displays are at the high end of the market.

A final emerging standard is super-hi-res, typically 1000 x 1000. While ideal for CAD/CAE applications in 2D and especially 3D, hardware to meet this standard is extremely expensive.

Shakeout in standards

Accompanying the evolution of graphics standards is the inevitable confusion for dealers and customers alike – how do they find the combination of software-card-monitor which is affordable, effective, and allows some flexibility for future changes?

Mono text and CGA together have declined to 30 per cent of the market, with 20 per cent projected for next year. The mono-graphics 320 x 200/ Hercules/Tseng segment has 40 percent 400-line colour has 4 percent, and EGA has 20 percent with a projected rise to 30 percent in 1987. Hence the confusion, since none is compatible.

Fortunately, there is now an answer – gate-array technology. The new generation of Chip arrays results in higher performance, more features on a single board, reduced component count and therefore increased reliability, less board space and less cost to the consumer.

The STB Chauffeur HT (short for High Technology), for example, successfully combines six video standards and I/O capabilities on one board. Mono text, CGA, Hercules mono/graphics, Tseng 132-column, CGA emulation on mono with no drivers, and 400-line colour are all supported, to drive any monitor whether monochrome, CGA colour, 400-line colour, EGA or Multi-sync. Its only restriction is in not outputting all EGA colours, although another STB card (Multi-Res) will do that. One example of its worth is being able to display Lotus without modification in 132 columns instead of 80.

All these features are contained on one three-quarter length card, which has in addition a configurable parallel port, light-pen I/F, PC accelerator software for print buffering and disk emulation, optional serial port, and Clock/calendar.

Speeding up BASIC

by Nigel Burrell

Isn't it good to see the Spectravideo column back again? After a small break last year, we are back to give you more to read and try out on your Spectravideo. From this column onwards, I will be giving articles on different aspects of the computer, as well as advanced pieces on subjects previously published. This column, as before, will cater for all spectravideo users (SVI:318/SVI:328/MSX:728/MSX:738). Any comments relating to these articles are very much welcome – write to 313 Brougham St, Christchurch 2.

I thought I would devote this month's column to explain how to speed up your favourite BASIC (Beginners All-Purpose Symbolic Instruction Code) programs. If you have worked with BASIC before, you will know that it doesn't take long before the main loop of your games becomes too slow. To maintain speed within the loops and routines of your programs, a lot of substitutions have to be made. You may feel robbed when it becomes apparent that you might have to delete all your wonderful extras that were to be incorporated into your program, but with very careful planning, not as many substitutions may have to be executed.

When designing programs, it makes gocd sense to write down all the variables and their meanings, plus starting line numbers for all routines that you are intending to use. You can then refer back to your variable list on your paper to know which variable is already being utilised elsewhere in your program. Accidental variable picking is thus reduced, if not stopped completely.

Below is a list of comments that will help speed up programs.

- Try not to leave gaps or spaces between commands except within appropriate print statements and strings.
- Try to pack as many commands into one line as possible, but be very careful where IF and THEN statements are concerned. You should usually give one line for each IF and THEN statement, but if the arguments for the variables being asked are not likely to be true at the same time, then you could in fact pack them all on the same line and separate each statement with ELSE commands.

Also, watch out for GOTO & GOSUB. Put them on their own line number so you know where you stand at all times; otherwise it can become all too confusing.

- Be sure to put your routines as close as possible to the working loop of your program. Design the main loop of your programs into line numbers between 10 and 99. Put the section of your program that displays the title page and/or instructions at the back of the listing and simply incorporate a GOTO or GOSUB to it from line 10.

Obviously the computer works faster executing the commands on two digit line numbers than on four or five digits, which is why you should have the main loop of your program on these particular line numbers.

- String space: CLEAR more than enough string space than you are intending to use within your program. If you CLEAR only just enough space, the computer tends to slow down its string accessing time. By clearing at least 200 more bytes than needed, this problem will not occur.
- FOR and NEXT: these are the main looping statements that are used throughout any BASIC program. There is one small thing, however, that can make these statements work a bit quicker.

Instead of using:

```
FOR A=1 TO 100:FOR B=1 TO
  255: main loop : NEXT A,B
```

just simply use:

```
FOR A=1 TO 100: FOR B=1 TO
  255: main loop: NEXT: NEXT
```

- Try to keep the variable list as small as possible, and with the variables you are using, keep them single digited, eg A=4 instead of AA=4.
- Precision variables: work out which variables require accurate decimal readings and which variables don't, and then utilise the DEFINT statement. This speeds up variable exchange about three times. For example, if variables A to D are always going to be used for INTEGER values, then at the start of the program, type in the statement: DEFINT A-D or DEFINT A,B,C,D.
- Time jumps: if you wish to have the computer jump to another part of your program when a certain time is reached, try to avoid using variables as a timing device. Use ON INTERVAL=time GOSUB... instead of T=T+1:IF T>100 THEN GOSUB... The ON INTERVAL command works much faster than having to go through the T=T+1 version at every loop count.
- Toggle variables: sometimes throughout a loop, you need to reserve a variable for a toggle, eg: A=4 one time, then R=5 the next, then back to A=4 again, etc... Instead of using IF A=4 THEN A=5 ELSE A=4, all you need to do is assign A to equal 4 at the start of the program and incorporate A=9–A into the actual loop, 9 being the sum of 4 and 5 which is the two numbers you wish to toggle. Each time the computer encounters this A=9–A statement, it toggles the variable accordingly.
- On-line statements: some programmers tend to use two variables when accessing two parts of the computer ports (joysticks and/or space bar plus trigger). This is not necessary. Instead of using S0=STICK(0): S1=STICK(1), try S=STICK(0) OR STICK(1). It works in the same way, but the computer assigns the results to just one variable. The same can be used for STRIG.

Also, IF and THEN statements do not have to be present when assessing what variables should be incremented or decremented in accordance with the result of the joystick movement or trigger.

Instead of...

```
10 IF E=1 THEN B=B–1
20 IF E=5 THEN B=B+1
30 IF E=3 THEN A=A+1
40 IF E=7 THEN A=A–1
```

Use this version:

```
10 ON E GOSUB 30,40,40,40,50,60,
    60,60
20 GOTO 10
30 B=B–1: RETURN
40 A=A+1: RETURN
50 B=B+1: RETURN
60 A=A–1: RETURN
```

This routine may not look as small, but it certainly runs faster.

- Order of appearance on first line of program: this has nothing to do with obtaining more speed throughout your program, but it is nevertheless just as important to know. This paraphrase will show you how to set up the screen and variable format for any BASIC program.

1. Clear the amount of string space to be used.
2. Set appropriate variables to precision values.
3. Define screen colour.
4. Set text or graphic screen with sprite size.
5. DIM any ARRAYS to be used.
6. Set SOUND controls.
7. GOTO or GOSUB to title page.

For example:

```
10 CLEAR 300:DEFINT A–Z:
COLOR 15,1,1:SCREEN 1,2:DIM
A(23),B(23):SOUND 7,248: SOUND
1,323: SOUND 8.0: GOSUB 400
```

By keeping in mind all of the above comments, you may just be able to include another routine or two into some of your programs and still maintain sufficient speed. Another option you may like to consider in the future is to learn how to program in machine language. Quite often in this field, loops have to be incorporated into the programs to actually slow down the execution speed. Wouldn't that be great in a BASIC program?

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DUNEDIN
National Mutual Arcade, George St

Switcher

by Paul Left

This month we present a tutorial which describes the use of an array to implement a game-board, and which offers readers with some BASIC experience the task of completing a simple game program.

Arrays are used in many types of BASIC programs to store data. Any game which involves a game-board in the form of a grid can use an array to implement the board, allowing for easy manipulation and display of the elements of the board. A numeric array allows the programmer to represent the condition of the various squares on a grid with numbers.

For example, a 4 by 4 grid could be constructed as a 2-dimensional array of the same size, with the presence of playing pieces on any element shown by the value of the corresponding element of the array. A zero could represent an empty cell, a 1 represent a 'friendly' playing piece, and a −1 represent an 'enemy' piece. Movement on the playing board can be easily implemented by addition and subtraction operations on the 2 cells involved.

BASIC versions of the well-known game Life usually use this technique to simulate succeeding generations of a colony of living cells.

A grid may also be represented by a 1-dimensional array, as any cell can be given a unique number. In the 4 by 4 example given above, the cells could be numbered 1 to 16, and a chess board could be implemented by setting up an array with elements numbered 1 to 64. This is often done to conserve memory or to simplify arithmetic operations on the array. In the sample program used in this article, a 1-dimensional array has been used. A 2-dimensional array would have simplified the display of the game board but made the arithmetic routines a little more complicated.

LISTING ONE

```
5000 REM RANDOM SETUP
5010 T = 0: REM initialise total
5020 FOR F = 1 TO 9
5030 X = INT (RND(1) * 2)
5040 IF X = 0 THEN X = -1
5050 B%(F) = X
5060 NEXT F
5070 RETURN
```

LISTING TWO

```
100 REM display game board
110 HOME
120 VTAB 8
    :HTAB 17
    :FOR F = 1 TO 3
130 INVERSE
140 IF B%(F) = -1 THEN FLASH
150 PRINT F;
    :NORMAL
    :PRINT " ";
160 NEXT F
170 PRINT
    :PRINT
180 HTAB 17
190 FOR F = 4 TO 6
200 INVERSE
210 IF B%(F) = -1 THEN FLASH
220 PRINT F;
    :NORMAL
    :PRINT " ";
230 NEXT
240 PRINT
    :PRINT
250 HTAB 17
260 FOR F = 7 TO 9
270 INVERSE
280 IF B%(F) = -1 THEN FLASH
290 PRINT F;
    :NORMAL
    :PRINT " ";
300 NEXT
310 RETURN
```

LISTING THREE

```
300 REM get command
310 VTAB 22
    :PRINT "Command: ";
320 GET G$
    :G = VAL (G$)
    : IF G < 1 OR G > 9 THEN GOTO 300
330 ON G GOSUB 500,550,600,650,700,750,
    800,850,900: REM reverse routines
340 RETURN
```

Please note that only the most essential routines of the program are given here. To complete the game you will need to write a short main routine to call the subroutines, and some code to clear the screen where appropriate, and display messages. The amount of programming needed is minimal, but should prove to be a worthwhile educational project. Study the routines listed carefully, as they contain the heart of the game. This will be useful even if you don't finish the program. The listings are not elegantly written but are intended to be easy to read and understand without being too wordy. Renumber them where necessary, and don't enter any code at the keyboard until you have read through the listings and planned your finished program carefully.

The game (I call it Switcher) is based on a puzzle of unknown origin available several years ago as a hand-held electronic device. Switcher uses a 3 by 3 grid, numbered 1 to 9, where each cell can be flashing or not flashing. At the beginning of play, certain randomly-chosen cells are flashing, and the purpose is to turn them all off. Typing a number (1 to 9) will reverse the state of that cell and several others in a pre-determined pattern. That is, if a cell is flashing it will be turned off and if it is not flashing it will be turned on.

A sequence of steps will be necessary to reverse blocks of cells in turn in order to turn all cells off. The patterns used by the program to reverse the cells are logical and symmetrically consistent across the board, but generally unknown to the new player. The game therefore has two objectives: first, to discover the rules, and second, to apply them to solve the puzzle. By the way, the game is actually simpler than the explanation would make it seem!

To implement the grid for Switcher, we need to set up a numeric array and assign a starting value to each element. There are several ways of assigning values to represent the two possible states for each cell, and an obvious solution would be to use 0 for 'flash-off' and 1 for 'flash-on'.

There are no moving pieces in Switcher, however, merely reversals of state of the cells. This led me to choose a different solution to assigning values: namely, using 1 for 'flash-off' and −1 for 'flash-on'. This is advantageous because 'minusing' a positive number makes a negative number, and 'minusing' a negative number makes a positive number.

In other words, the BASIC statement

LET A(Q) = −A(Q)

can be used to reverse the state of a cell regardless of the present state. The value of any cell can only be 1 or −1. Accordingly, an integer array is used to store the values to save space (not really necessary with a game-board this small!) and improve speed.

Listing 1 assigns values of 1 and −1 at random to the elements of the integer array B%, which should have

been previously set up with the statement

DIM B%(9)

By the way, make sure this DIM statement is executed once only, or an error condition will halt the program. You cannot DIMension any given array more than once.

LISTING FOUR

```
500 REM 1
510 B%(1) = - B%(1)
   :B%(2) = - B%(2)
   :B%(4) = - B%(4)
   :B%(5) = - B%(5)
520 RETURN
550 REM 2
560 B%(1) = - B%(1)
   :B%(2) = - B%(2)
   :B%(3) = - B%(3)
570 RETURN
600 REM 3
610 B%(2) = - B%(2)
   :B%(3) = - B%(3)
   :B%(5) = - B%(5)
   :B%(6) = - B%(6)
620 RETURN
650 REM 4
660 B%(1) = - B%(1)
   :B%(4) = - B%(4)
   :B%(7) = - B%(7)
670 RETURN
700 REM 5
710 B%(2) = - B%(2)
   :B%(4) = - B%(4)
   :B%(5) = - B%(5)
   :B%(6) = - B%(6)
   :B%(8) = - B%(8)
720 RETURN
750 REM 6
760 B%(3) = - B%(3)
   :B%(6) = - B%(6)
   :B%(9) = - B%(9)
770 RETURN
800 REM 7
810 B%(4) = - B%(4)
   :B%(5) = - B%(5)
   :B%(7) = - B%(7)
   :B%(8) = - B%(8)
820 RETURN
850 REM 8
860 B%(7) = - B%(7)
   :B%(8) = - B%(8)
   :B%(9) = - B%(9)
870 RETURN
900 REM 9
910 B%(5) = - B%(5)
   :B%(6) = - B%(6)
   :B%(8) = - B%(8)
   :B%(9) = - B%(9)
920 RETURN
```

The routine in Listing 2 displays the grid, Listing 3 GETs the player's response, and Listing 4 implements the rules of Switcher by reversing the values of the appropriate cells. Note that Listing 4 is a set of subroutines, and that the correct routine is accessed by the ON GOSUB in Listing 3. That is, if the player types '1', the BASIC interpreter GOSUBs to line 500. It is possible to discover the rules of Switcher by studying Listing 4, so don't do so if you want the most enjoyment from the game.

Since the listings here do not give the whole game, you will need to write your own routines in order to build a running program. You will need a Title screen and Instructions, possibly two separate routines.

You will also need some way of checking for the successful solution of the puzzle. This is simple to do if you consider the possible values of the elements of the array. The sum of the values can be a certain amount only if all the values are 1. Use a FOR...NEXT loop to add the values at every pass through the main program loop. If this total is the correct value, jump to a routine which displays a congratulatory message.

You may also wish to add a help function to your program which is accessed by the player typing any key other than a value of 1 to 9 for the move. A very useful feature is the ability to type in your own pattern, which may be used for practice, to find out the rules, or as a two-player game. This is easily implemented by using a FOR...NEXT loop to find the value of each character in an INPUT string and set the corresponding cell to –1.

You might also like to modify the game board and/or the rules of Switcher. You could, for example, change the patterns of reversal, or increase the grid size to 4 by 4. You could also drastically increase the difficulty of the game by providing for 3 states: –1, 0, and 1. This is easily displayed with the Apple's INVERSE, NORMAL, and FLASH modes, but requires changes to the routines in Listing 4.

HARDWARE ROUNDUP PART 3

Microcomputers over $8,000

In this final part of our roundup of the latest available personal computers in New Zealand we look at machines at the upper end of the market, plus one or two late responses. These more expensive micros are mostly those of the AT-compatible and multi-user variety, suitable for business applications.

APPLE IIe

Processor	65C02
RAM	128Kb
ROM	16Kb
Keyboard	typewriter type with 63 keys, 2 function keys
Video	40/80 column text, 5 x 7 dot matrix, low and high res colour graphics
Resolution	low — 16 colours 40 x 48 high — 6 colours, 280 x 192
Interfaces	printer, disk drive plus 3rd party cards
Disk drives	140Kb, 800Kb
Operating system	Apple PRODOS, DOS, CP/M, Pascal
Languages	incl. Basic, Pascal, Logo, Pilot, Prolog
Optional	wide range of Apple branded and 3rd party extras including drives (floppy and hard disk), numeric keypads, special education add-ons, colour, system, training disks
Price	$2445 (mono), $2845 (colour)
Agents	CED Distributors Ltd.

APPLE II GS

Processor	65C816
RAM	512Kb exp to 8Mb
ROM	128Kb exp. to 1Mb
Keyboard	typewriter style, 94 keys
Video	320 x 200, 16 colours/line — super hi-res; 640 x 200, 4 colours/line — super hi-res; 560 x 192, 16 colours — double hi-res; 280 x 192, 6 colours — low-res
Interfaces	1 expansion, 7 general purpose I/O slots, 2 serial, 1 disk drive ports, game I/O, audio
Disk drives	140Kb, 400Kb
Operating system	PRODOS 8, PRODOS 16, Pascal, DOS, CP/M
Optional	Bose speakers, HD20 SCSI, FAN
Bundled software	system, training disks
Price	$4100.00 (mono), $4700.00 (colour)
Agents	CED Distributors Ltd.

APPLE MACINTOSH 512K/800

Processor	68000
RAM	512Kb
ROM	128Kb
Keyboard	78 keys incl. numeric keypad and cursor, detachable, software mapped
Video	9" screen, 512 x 342, bit-mapped display
Interfaces	2 RS 422 serial ports
Disk drives	800Kb internal and external
Other components	mouse
Operating system	Apple Macintosh
Languages	incl. C, Pascal
Optional	20Mb hard disk, SCSI hard disk, Imagewriter II, dot matrix printer, Laserwriter Plus
Bundled software	system tools, software sampler, Guided Tour disk
Price	$4795
Expansions	exp. to Mac Plus
Agents	CED Distributors Ltd.

APPLE MACINTOSH PLUS

Processor	68000
RAM	1Mb
ROM	128Kb
Keyboard	78 keys incl. numeric keypad and cursor detachable, software mapped
Video	9" screen, 512 x 342, bit-mapped display
Interfaces	2 RS-422 serial, 1 SCSI parallel ports
Disk drives	800Kb internal and external
Other components	mouse
Operating system	Apple Macintosh
Languages	incl. C, Pascal
Optional	SCSI hard disk, Imagewriter II, dot matrix and printer, Laserwriter Plus
Bundled software	system tools, software sampler, Mac Plus, Guided Tour
Price	$5795
Agents	CED Distributors Ltd.

DATAMINI AT TURBO

Processor	80286
RAM	640Kb
Keyboard	84 keys
Video	12 inch green antiglare monitor
Interfaces	serial, parallel, mono or colour graphics
Disk drives	1.2Mb floppy, 20Mb hard
Other components	external turbo switch
Operating system	MS-DOS 3.2
Price	$7290
Agents	MoS
Expansions	full range of boards available

IBM PCXT

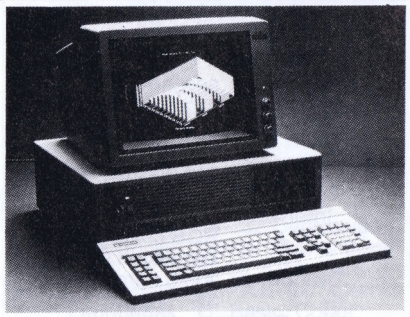
Processor	8088
RAM	256Kb
ROM	64Kb
Keyboard	101 keyboard, 12 function keys, numeric keypad
Video	mono, colour graphics, ECG
Resolution	640 x 200, ECG — 640 x 350
Disk drives	1 x 5¼" (468), 2 x 5¼" (478), 1 x 5¼", 1 x 20Mb (489)
Operating system	PC-DOS 3.2
Languages	Basic
Price	from $5,677 (468) to $7,418 (489)
Agents	IBM
Expansions	to 640Kb

TANDON AT

Processor	80286-8
RAM	512Kb
Video RAM	40Kb
Keyboard	IBM AT layout
Video	mono or colour
Resolution	720 x 348 or 640 x 350
Interfaces	optional serial/ parallel
Disk drives	1.2Mb 5¼" floppy, 20, 30 or 40Mb hard
Operating system	MS-DOS 3 optional PCDOS
Languages	GW-Basic
Optional	all IBM languages
Price	$7530
Agents	Barson Computers
Expansions	all IBM AT options

TSE AT

Processor	80286
RAM	640Kb
ROM	64Kb exp. to 128Kb
Keyboard	98 keys, separate numeric, cursor keypads
Video	green or amber, TTL or RGB
Resolution	720 x 348 or 640 x 200
Interfaces	parallel, 80287 socket
Disk drives	1.2Mb floppy, 30Mb hard
Other components	real time clock/calendar
Operating system	MS-DOS 3.2
Languages	GW-Basic
Price	from $4995 (floppy), $7995 (Winchester)
Agents	Pacific Computers
Expansions	to 1024Kb on board, total 8Mb, 8 exp. slots

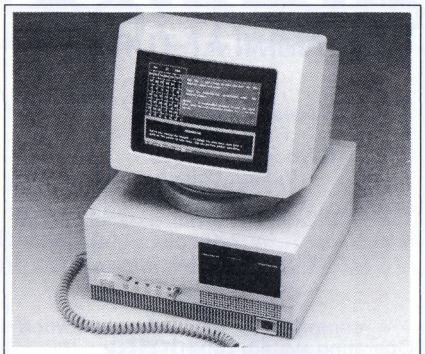


MULTITECH PC-900

Processor	80286
RAM	512Kb
Keyboard	standard AT type
Video	monochrome graphics adapter
Resolution	740 x 348
Interfaces	1 x parallel, 2 x serial
Disk drives	1.2Mb floppy, 20Mb hard
Operating system	MS-DOS 3.1
Optional	CGA, EGA display
Price	depends on configuration
Agents	Dick Smith Electronics
Expansions	to 1Mb

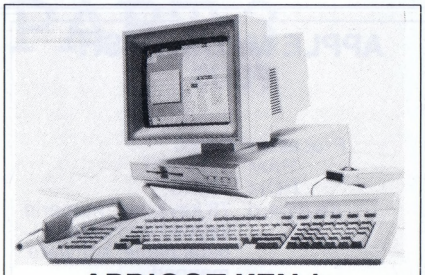
APRICOT XEN-xi

Processor	80286-6
RAM	640Kb
ROM	32Kb
Video RAM	40Kb
Keyboard	qwerty, with separate numeric, function, and LCD microscreen
Video	monochrome fitted, option CGA or EGA
Resolution	720 x 348 mono; 640 x 350 colour
Interfaces	parallel, serial
Disk drives	10Mb or 20Mb hard, 12Mb 5¼" floppy
Operating system	MS-DOS 3.2
Languages	GW-Basic
Bundled software	MS windows, paint, write
Price	$8400
Agents	Barson Computers
Expansions	Xentel telephone management



OLIVETTI M28

Processor	80286-8
RAM	8Mb
ROM	32Kb
Keyboard	industry standard
Video	green, amber, colour,
Resolution	640 x 400
Interfaces	serial, parallel, mouse
Disk drives	20, 40, 70Mb, plus other options
Other components	1.2M FDD
Operating system	MS-DOS, Xenix, Unix, Pick
Languages	all
Optional	streaming tape backup, LAN
Price	$10,586 plus GST, 20Mb HDD
Agents	Olivetti

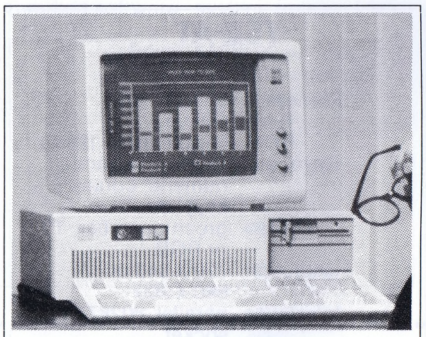


APRICOT XEN-i

Processor	80286 — 10 MHz
RAM	640K & 340K above board
Video RAM	40Kb
Keyboard	qwerty, with separate cursor keys, numeric pad and LCD micro-screen
Video	mono paper white, optional EGA
Resolution	720 x 348
Interfaces	parallel, serial
Disk drives	5¼" 1.2Mb floppy, 20 or 40Mb hard
Operating system	MS-DOS 3.2 optional Xenix, BOS
Languages	GW-Basic
Optional	EGA
Bundled software	MS windows, paint, write
Price	$10,820
Agents	Barson Computers
Expansions	external floppy, Xentel telephone

TOSHIBA T3100

Processor	80286-8
RAM	640Kb
Keyboard	81 keys, numeric keypad
Video	gas plasma, 80 x 25
Resolution	640 x 400
Interfaces	parallel, serial ports, RGB colour, expansion slot
Disk drives	10Mb hard, 720Kb 3½" floppy
Other components	calendar clock
Operating system	MS-DOS
Optional	internal modem card
Expansions	to 2.6Mb RAM
Agents	Hanimex-Toshiba



IBM PC/AT

Processor	80286-8
RAM	512Kb exp to 10.5Mb
ROM	64Kb
Keyboard	new enhanced keyboard
Video	mono, colour or enhanced colour
Resolution	640 x 350, or 640 x 200
Interfaces	serial and parallel
Disk drives	30Mb fixed, 1.2Mb diskette
Other components	8 exp. slots; keylock
Operating system	DOS 3.10 or higher; IBM PC Xenix 2.00
Languages	Basic
Price	$11,871
Agents	Powercorp Group Ltd.
Expansions	30Mb disk, 1.2Mb or 360Kb, 5.25" diskette

APRICOT XEN

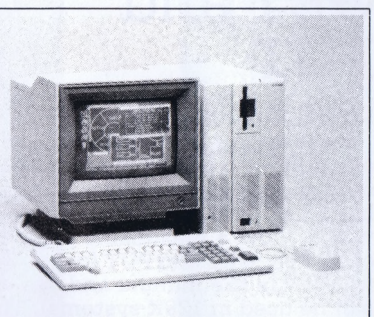
Processor	80286 — 8 MHz
RAM	1Mb
ROM	32Kb
Video RAM	40Kb
Keyboard	qwerty, with separate numeric pad, LCD micro-screen
Video	mono or RGB colour
Resolution	800 x 400 (mono), 640 x 350 (colour)
Interfaces	parallel, serial
Disk drives	20, 40Mb hard disk, 3.5" 720K floppy
Other components	mouse
Operating system	MS-DOS 3.2 optional Xenix, BOS
Languages	GW-Basic
Bundled software	MS windows, paint, write, Async comms
Price	$13,990
Agents	Barson Computers
Expansions	Xentel telephone management, Network

COMPAQ DESKPRO 386

Processor	80386
RAM	1Mb
Keyboard	84 key qwerty or 101 key
Video	12" amber or green
Resolution	720 x 350 text, 640 x 200 graphics
Interfaces	RF Modulator, composite video, light pen, RGB parallel, serial ports
Disk drives	½ height 5 ¼": 360K floppy, 1.2Mb floppy 40/70 130Mb hard disk
Operating system	MS-DOS 3.1, Xenix 286 U5
Optional	EGA, 10/40Mb internal tape backup
Price	from $15,000
Agents	Datatronic Systems
Expansions	4 full length exp. slots, to 10Mb

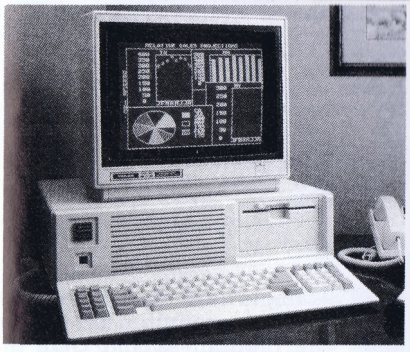
CANON A200EX

Processor	80286
RAM	640Kb
ROM	32Kb
Keyboard	AT compatible
Video	12" tilt swivel
Resolution	640 x 400
Interfaces	serial/parallel
Disk drives	1.2Mb floppy (5.25), one or two 20 or 40Mb HD
Other components	360Kb drive option, colour, co-processor
Operating system	MS-DOS V3
Price	P.O.A.
Agents	Canon Data Products
Expansions	to 15.5Mb



CANON AS-300

Processor	8086
RAM	256Kb
ROM	16Kb
Video RAM	64Kb mono, 192Kb colour
Keyboard	12 function keys, separate cursor pad, inbuilt mouse port
Video	colour and mono, 12" and 14" CRT, tilt/swivel
Resolution	768 x 540, 1088 x 756
Interfaces	serial, parallel
Disk drives	3.5" 720Kb
Other components	mouse
Operating system	MS-DOS
Price	P.O.A.
Agents	Canon Data Products
Expansions	to 768Kb, one or two 3.5 drives, 10Mb hard disk



TANDY 3000HD

Processor	80286
RAM	640Kb
Keyboard	separate, 84 keys, 10 function keys
Video	mono or colour RGB
Resolution	640 x 200, 80 x 25
Interfaces	parallel, 9-pin RS-232
Disk drives	1.2Mb floppy, 40Mb Winchester
Other components	battery real time clock
Operating system	MS-DOS 3.2 or Xenix 5.0
Expansions	3 x 8 bit slots, 7 x 16 bit slots, up to 12Mb RAM, 80Mb Winchester
Optional	80287 math co-processor, Xenix 5.0
Price	P.O.A.
Agents	Computer Advances

WANG PROFESSIONAL COMPUTER

Processor	Intel 8086
RAM	512-768Kb
Keyboard	101 keys, Help key
Video	monochrome or colour, 80 x 25
Resolution	800 x 300
Interfaces	RS 232, Centronics standard
Disk drives	360Kb floppy max-2
Other components	10Mb, 20Mb, 30Mb hard disk
Operating system	MS-DOS CP/M-80 IN/IX
Languages	C-Basic, Cobol, Fortan, Pascal
Optional	8 slot version, graphics, memory expansion cards
Bundled software	operating system only & basic interpreter, Wang menu system
Price	P.O.A.
Expansions	upgradable to Wang APC
Agents	Wang Computer Ltd.

WANG APC

Processor	80286-8
RAM	512Kb-2Mb
Keyboard	101 keys, help key
Video	monochrome or colour, 80 x 25
Resolution	800 x 300
Interfaces	RS-232/Centronics
Disk drives	360Kb, 1.2Mb floppy, 20, 30, 67Mb hard
Operating system	MS-DOS IN/IX Xenix
Languages	'C', Basic, Cobol, Fortran, Pascal compilers
Optional	Xenix, Wang word processing, Multiplan, Lotus 1-2-3 & IBM emulation
Price	P.O.A.
Agents	Wang Computer Ltd.
Expansions	exp. to 4 screen Xenix multi-user system

GET and PUT

by Bryce Utting

The Sanyo's HD46505 CRTC (actually a Motorola 6845 if you want the data sheets) cannot handle sprites, but Sanyo BASIC has two commands which allow a reasonable simulation of sprites: GET and PUT (pages 3-115 to 3-117 in the manual and yes, they *can* be used in 128K systems). These are not easy commands to master quickly, so I won't cover animation until the next issue.

The main advantage is speed, and in static displays this is best shown when drawing one item several times. To see this for yourself run program 1, which prepares graphs for your new tree-growing company and is... slow. If you alter it (using program 1a), you will notice a 25-fold increase in speed due to the use of PUT in line 110. Looking closely at why this happens, it becomes obvious that the subroutine at 1000 is used only once and is used to create a "stamp" (the integer array TREE%) in line 35.

If you watch closely, you will see this being drawn and then erased when the program starts. The use of this is that each tree can be drawn in 0.04 seconds instead of one second.

This leads on to a problem which may not be readily apparent to start with: the tree is always drawn with the same background colour and destroys anything behind it. To see this (and your thriving trees) run program 2. A first attempt at correction may make the "fixes" in program 2a (try it). Trees 1 and 3 are now alright, but what about tree 2?

If you refer to the manual under PUT, you will see some functions listed which alter the effects of the PUT command. PSET and PRESET are simple enough, but I doubt that anyone who isn't a professional programmer or a hacker will understand the Boolean operators completely.

Put simply, OR will merge the stamp with the background, AND will only put on the screen those pixels common to both the stamp and the background, and XOR defies meaningful description and is used mainly for animation (more in the next column). The Boolean operators can be used to PUT an object on the screen without necessarily destroying the background. To try this, run program 2b. Notice that nothing happens to the background in the square area around tree 2.

You may have noticed the different colours in line 1070 in different versions of program 2. The reason for this is that stamps can undergo unpredictable colour changes when placed onto a background using Boolean operators. Unless you decide to stick to a monochrome stamp, truth tables are very useful. Program 3 creates tables which detail the way colours change under different operators.

Close examination of these tables can produce some useful effects. A good example is a fast method of inverting an areas of the screen – normally the program would GET the area to be inverted and PUT it with the PRESET option. The quick way is to PUT a white stamp over the area using the XOR option, which has the same effect but takes roughly half the time.

This can be done to the entire screen if your system has 256K (I haven't been able to test a 192K system). The way BASIC sets up the array space doesn't immediately allow for this, so memory must be reserved by entering CLEAR,,10000 (at the start of your program or all variables will vanish) and defining an integer aray with approximately 25000 elements. The PUT command takes three seconds to execute with an array of this size, but at 23 microseconds for each pixel this isn't as bad as it could be.

```
10 ' Program 1
20 '    Trees
30 COLOR ,0:CLS:LOCATE 1,1,0
40 SYMBOL (32,8),"TREES PLANTED PER MONT
H",3,4,7
50 FOR N=1 TO 6
60 SYMBOL (16,40+N*24),MID$("JanFebMarAp
rMayJun",N*3-2,3),2,1,3
70 NEXT N
80 FOR N=1 TO 6:Y=32+24*N
90 LOCATE 6+N*3,14:INPUT (2)"Trees:",A$:
LOCATE 6+N*3,14:PRINT "          "
100 A=VAL(A$):IF A=0 THEN 130
110 FOR M=1 TO A:X=64+M*32:GOSUB 1000
120 NEXT M
130 NEXT N
140 GOTO 140
1000 REM Draw tree
1010 FOR L1=22 TO 17 STEP -1:FOR L2=0 TO
 1
1020 PSET (X+10+(L1 MOD 2)+L2*2,L1+Y),4
1030 NEXT L2,L1
1040 RESTORE
1050 FOR L1=16 TO 2 STEP -1
1060 READ X1,X2
1070 LINE (X+X1,L1+Y)-(X+X2,L1+Y),2
1080 NEXT L1
1090 RETURN
1100 DATA 2,21,4,19,6,17,8,15,9,14,4,19,
6,17,8,15,9,14,6,17,8,15,10,13,8,15,10,1
3,11,12
```

```
10 ' Program 1a
20 '    Trees
25 DIM TREE%(105)
35 X=0:Y=0:GOSUB 1000:GET (0,0)-(21,22),
TREE%:CLS
110 FOR M=1 TO A:X=64+M*32:PUT (X,Y),TRE
E%
```

```
10 ' Program 2
20 '    Hills
30 DIM TREE%(105)
40 COLOR ,0:CLS:LOCATE 1,1,0
50 X=0:Y=0:GOSUB 1000:GET (0,0)-(21,22),
TREE%
60 COLOR ,1:CLS
70 FOR N=0 TO 639
80 PSET (N,120-20*SIN(N/70-1)),0
90 NEXT N
100 PAINT (320,170),2,0
110 RESTORE 2000
120 READ Z:IF Z=-1 THEN 160 ELSE READ X,
Y
130 PUT (X,Y),TREE%
140 SYMBOL (X+4,Y+24),STR$(Z),1,1,0
150 GOTO 120
160 GOTO 160
1000 REM Draw tree
1010 FOR L1=22 TO 17 STEP -1:FOR L2=0 TO
 1
1020 PSET (X+10+(L1 MOD 2)+L2*2,L1+Y),4
1030 NEXT L2,L1
1040 RESTORE 1100
1050 FOR L1=16 TO 2 STEP -1
1060 READ X1,X2
1070 LINE (X+X1,L1+Y)-(X+X2,L1+Y),2
1080 NEXT L1
1090 RETURN
1100 DATA 2,21,4,19,6,17,8,15,9,14,4,19,
6,17,8,15,9,14,6,17,8,15,10,13,8,15,10,1
3,11,12
2000 DATA 1,150,120
2010 DATA 2,376,128
2020 DATA 3,566,154
2030 DATA -1
```

```
10 ' Program 2a
20 '    Hills
40 COLOR ,2:CLS:LOCATE 1,1,0
1070 LINE (X+X1,L1+Y)-(X+X2,L1+Y),6
```

```
10 ' Program 2b
20 '    Hills
40 COLOR ,0:CLS:LOCATE 1,1,0
130 PUT (X,Y),TREE%,OR
1070 LINE (X+X1,L1+Y)-(X+X2,L1+Y),7
```

```
10 ' Program 3
20 '    Boolean Truth Tables
30 DEFINT A-Z
40 COLOR 5,1:CLS
50 DIM COLOUR$(7)
60 GOSUB 1000
70 SYMBOL (32,16),"Truth Tables",6,3,7
80 SYMBOL (116,48)," rinter or  creen",3
,2,5
90 SYMBOL (116,48),"P           S",3,2,7
100 A$=INPUT$(1)
110 OUTPUT=-(A$="P" OR A$="p")-2*(A$="S"
 OR A$="s")
120 LOCATE 20,1:INPUT "AND, OR, XOR";A$
130 SELECT=-(A$="AND" OR A$="and")-2*(A$
="OR" OR A$="or")-3*(A$="XOR" OR A$="xor
")
140 ON SELECT GOSUB 200,300,400
150 RUN
200 FOR N=0 TO 7
210 FOR M=0 TO 7
220 ARRAY(N,M)=N AND M
230 NEXT M,N
240 GOSUB 500
250 RETURN
300 FOR N=0 TO 7
310 FOR M=0 TO 7
320 ARRAY(N,M)=N OR M
330 NEXT M,N
340 GOSUB 500
350 RETURN
400 FOR N=0 TO 7
410 FOR M=0 TO 7
420 ARRAY(N,M)=N XOR M
430 NEXT M,N
440 GOSUB 500
450 RETURN
500 ON OUTPUT GOSUB 600,700
510 RETURN
600 LPRINT
610 FOR N=0 TO 7:LPRINT TAB(N*8+10);COLO
UR$(N);:NEXT N:LPRINT:LPRINT
620 FOR N=0 TO 7:LPRINT COLOUR$(N);
630 FOR M=0 TO 7:LPRINT TAB(M*8+10);COLO
UR$(ARRAY(N,M));:NEXT M:LPRINT
640 NEXT N
650 LPRINT
660 RETURN
700 CLS
710 FOR N=0 TO 7:PRINT TAB(N*8+10);COLOU
R$(N);:NEXT N:PRINT:PRINT
720 FOR N=0 TO 7:PRINT COLOUR$(N);
730 FOR M=0 TO 7:PRINT TAB(M*8+10);COLOU
R$(ARRAY(N,M));:NEXT M:PRINT
740 NEXT N
750 PRINT
760 A$=INPUT$(1)
770 RETURN
1000 FOR N=0 TO 7
1010 READ COLOUR$(N)
1020 NEXT N
1030 RETURN
1100 DATA Black,Blue,Green,Cyan,Red,Mage
nta,Yellow,White
```

Notes from everywhere

by James Lawry

The Amstrad manual is quite good, but there are topics that it does not explain as well as it should, and other points that are useful but not mentioned. Here are a few useful ideas I have come across, of interest mainly to BASIC programmers and CP/M users. Any hints you may have along the same lines would be welcomed; just write to me C/- Bits & Bytes.

How to get more memory: if you have a program which will not quite fit into memory (big arrays, for example) and it uses no user-defined characters (no SYMBOL commands), you can get 128 bytes extra memory by adding SYMBOL AFTER 256 at the start of your program. This erases the memory used by characters 240 to 255, which are stored above HIMEM by default, and raises HIMEM correspondingly. The line with SYMBOL AFTER 256 must come before all MEMORY statements and file-handling statements (OPENINs and OPENOUTs).

BASIC variable storage: when a variable is initialised, it is stored in memory after the end of the program. To find out exactly where in RAM a particular variable is stored, the @ function may be used. For example, @ var is equal to the start of where var is stored in RAM. If the variable is of type integar, the address returned is that of the value stored in low byte, high byte fashion. Reals use four bytes, and the value returned is the address of the first of these.

The manner in which these are stored is very complicated and may be covered in a future column. For strings, the address returned is for the first of three bytes. The first stores the length of the string and the next two store the location where the string is actually stored (again in the low-byte, high-byte form). If you try to use the @ function with a variable that has not been declared, you will get an IMPROPER ARGUMENT error. Variables' locations in RAM are useful for interfacing machine language subroutines with BASIC variables.

CP/M use and control characters: using CP/M's SETUP.COM program, it is possible to customise your CP/M working environment to a large extent. The sign-on string may contain control characters that set the mode, change colours and create windows, and keyboard translations and expansions can redefine the keyboard. Here is a useful arrangement for a utilities disc:

Sign-on string:
^\@@@^\azz^]@@CP/M 2.2 General Utilities Disc^J^Mf1-STAT
£2-FILECOPY
£3-DISCOPY
£4-DISCCHK
£5-FORMAT
£6-AMSDOS^J^M^Z^@P^C^Y

Keyboard Translations:

Key code	Normal	Shift	Control
13	128	49	49
14	129	50	50
5	130	51	51
20	131	52	52
12	132	53	53
4	133	54	54

Keyboard Expansions:

Expansion Token	Expansion String
0	STAT
1	FILECOPY
2	DISCCOPY^M
3	DISCCHK^M
4	FORMAT
5	AMSDOS^

This set of values redefines £1 to £6 as the names of some more commonly used CP/M utilities, and displays the value of each at the top of the screen. The control characters at the start of the sign on string set the ink and border colours, while those at the end set up a window from the third to the 25th line of the screen, so that the display at the top will not scroll off the screen.

The method of using control characters is not well explained in the manual, so it is worthwhile to explain here how they work.

ASCII values from 0 to 31 can be entered from the keyboard by using the CTRL key in conjunction with

Try doing THIS in BASIC!

by Joe Colquitt

After the last issue, which in part dealt with data placement on the screen, it wouldn't hurt to go into visual organisation a bit further. I'm sure the topic is wide-ranging enough to keep people busy until the next issue. Unfortunately, the programs are C64 specific, but using the two routines together can produce some very tasty screens, easily altered from within the host program.

The first program up is a mixture of some of the techniques presented over the past few months, and is a modification of the ROM routine that CLeaRs the screen or HOMEs the cursor/prints. Basically it allows you to preset which lines will be emptied when you press CLR, and where the HOME position is. CLR refers to SHIFT/HOME.

When the normal ROM routine clears the screen, it does so by POKEing lines of spaces (CHR$32), starting at the bottom of the screen, until 25 lines have been blanked. You can see this in slow motion by using the following:

POKE56341,0 then press CLR. Use STOP/RESTORE or POKE56341,51 to return to normal.

Program 1, with your amendments, changes the limits of the clearing action. If you wish, you can also substitute a character of your choice for the CHR$(32) @ $C076. This would allow a whole screen, or section, to be POKEd with, say, dashes or full stops. It isn't really a window function, as PRINTing is not affected, only clearing. The modifications suggested can be used in a program to create almost a window effect. Pertinent locations for change are (with normal hex values):

C017 49175 line pointer (#$FF)
C05C 49244 bottom screen line of clear (#$18)
C062 49250 top line of clear (#$00)
C066 49254 cursor column for HOME (#$00)
C06A 49258 cursor row for HOME (#$00)
C06F 49263 right column clear limit (#$27)
C07F 49279 left column clear limit (#$00)

As is, the routine will clear a patch in the lower screen. To enable the system, SYS49152 and POKE1,53 and POKE1,55 to return to normal screen editing. This will need to be done to clear the whole screen. Parameters for different 'windows' can be passed from the host program. I've found that being able to clear only the top or bottom half of the screen can be very useful.

Program 2 is in a similar vein, except in this case the screen is modified by the use of a raster interrupt, but before discussing the program, an explanation of rasters is indicated.

NOTES FROM ELSEWHERE CONT.

other keys on the keyboard. The rule is: press the CRTL key together with the key that normally returns an ASCII value of 64 greater than the ASCII value required.

This sounds complicated, but it actually isn't. Let's take an example: to type CHR$(1), press the CTRL key and the key that normally returns an ASCII value of 1+64, or 65. Look up CHR$(65) in the manual, and it's the letter A. So to type CHR$(1), press CTRL-A. In the same way CHR$(2) is CTRL-B and so on through to CHR$(26) which is CTRL-Z, CHR$(0) which is CTRL-@, CHR$(28) which is CTRL-\, etc.

These characters perform various screen functions as mentioned above. For example, CHR$(24) (which is CTRL-X) exchanges pen and paper colours. But hang on, you're saying, if I type CTRL-X in BASIC, I don't get inverse printing, only a funny symbol. That's right, you have to understand that these characters only perform their function when PRINTed. If you type PRINT, a quote mark, CTRL-X (displaying the strange symbol), and then another quote mark, and then press ENTER, you will then get inverse printing. This is exactly equivalent to typing PRINT CHR$(24).

But how do you use them in the CP/M setup? In entering the sign-on string, instead of using these keys in conjunction with CTRL, you precede them with an up arrow: ^, For example, to include a CHR$(1) in the sign-on string, type ^A where you want the CHR$(1) to be.

Most of the control characters are followed by parameters, and these come immediately afterwards. This means that the start of the sign-on string (^\@@@) gives a CHR$(28), which is the control character to set pen colours, followed by its parameters, which are also expressed as ASCII codes. The first parameter is expected in a range of 0 to 15 to select which pen is being set, but a parameter outside this range is taken MOD 16 (the remainder after division), so the @ character (ASCII 64) gives the parameter 0.

In the same way the other two @ characters give parameters of 0 (in this case they are MOD 32 since the parameter is expected int he range 0 to 31) and the effect is to set pen 0 to flash between colour 0 and colour 0, or in other words steady black. In the same way, pen 1 is set to bright white and the border is set to black by the next codes, and the codes at the end give the window.

^J^M is the carriage return-line feed sequence. ^M can also be useful in the initial keyboard buffer and in the keyboard expansions. In the setup detailed above, DISCCOPY, DISCCHK and AMSDOS are followed by ^M to ENTER them automatically when typed. Note that STAT, FILECOPY and FORMAT are not followed by carriage returns since they are normally followed by a code of some sort. It is a good idea to enter a space after each of these three when typing them in.

You can change these function key values to any others without any problems. CP/M Plus users especially will want to because their utilities have different names. Remember to change the sign on string too, so you can see which key does what.

This setup will give strange results with CP/M commercial software, because of the window size, but it is handy to have on your CP/M backup disc.

Now for a few useful POKEs and CALLs:

CALL &BB03 clears the keyboard buffer (same as CLEAR INPUT).

CALL &BB4E resets the text screen after using graphics, windows, TAGs, and different pens.

CALL &BB6C clears the screen (or the current window).

POKE &BDEE, &C9 disables the CTRL-SHIFT-ESC resetting sequence.

CALL &BB7E turns off the cursor, and CALL &BB7B turns it on again.

CALL &BB9C is the same as PRINT CHR$(24), exchanging pen and paper inks.

CALL &BBBA resets the graphics pen, paper and origin.

CALL &BBDB clears the graphics window (same as CLG).

CALL &BC14 clears the screen but does not return the cursor to the top left corner.

CALL &BCA7 stops all sounds and clears the queues.

CALL &BB48 disables ESC-ESC, equivalent to ON BREAK CONT, making programs unstoppable except by resetting.

As you may be aware, a TV/monitor screen is drawn by horizontal scanning lines. At any point of the scanning process, the computer knows which line is being drawn, and this information is available to the user. By presetting a comparison register, an interrupt can be generated when the scanning line number matches the line number where you want the screen mode to change. The visible portion of the screen is scanned by lines 50 to 250 (nb the graphics/text area is also 200 lines high).

A second raster interrupt is needed to change modes after the first split, so that the top mode is restored. An interrupt could be generated at line 160, for example, and the top half of the screen set to bitmap mode, the lower half to normal characters, or any combination of bitmap/characters required with up to 16 sprites as well.

```
Modified CLR/HOME

C000 78        SEI         ;disable ints
C001 A9 00     LDA#$00     ;copy ROMs
C003 85 FE     STA$FE      ;into RAM
C005 A9 A0     LDA#$A0     ;
C007 85 FF     STA$FF      ;
C009 A8        TAY         ;
C00A B1 FE     LDA($FE),Y;
C00C 91 FE     STA($FE),Y;
C00E C8        INY         ;
C00F D0 F9     BNE$C00A    ;
C011 E6 FF     INC$FF      ;
C013 D0 F3     BNE$C00A    ;
C015 58        CLI         ;
C016 A9 0A     LDA#$0A     ;line pointer
C018 8D F7 E8  STA$E8F7    ;
C01B A9 EA     LDA#$EA     ;put NOPs into
C01D A2 00     LDX#$00     ;ROM routines
C01F 9D 5A E5  STA$E55A,X;
C022 9D FF E9  STA$E9FF,X;
C025 E8        INX         ;
C026 E0 12     CPX#$12     ;
C028 D0 F5     BNE$C01F    ;
C02A A9 20     LDA#$20     ;JSR$C057 at
C02C 8D 5A E5  STA$E55A    ;$E55A
C02F 8D 66 E5  STA$E566    ;JSR$C065 at
C032 8D 0F EA  STA$EA0F    ;$E566
C035 A9 C0     LDA#$C0     ;JSR$C06E at
C037 8D 5C E5  STA$E55C    ;$EA0F
C03A 8D 68 E5  STA$E568    ;
C03D 8D 11 EA  STA$EA11    ;
C040 A9 57     LDA#$57     ;
C042 8D 5B E5  STA$E55B    ;
C045 A9 65     LDA#$65     ;
C047 8D 67 E5  STA$E567    ;
C04A A9 6E     LDA#$6E     ;
C04C 8D 10 EA  STA$EA10    ;
C04F A9 33     LDA#$33     ;
C051 8D 15 DC  STA$DC15    ;56341,51
C054 60        RTS         ;

clr (originally at $E55A)
C057 A9 FF     LDA#$FF     ;
C059 95 D9     STA$D9,X    ;
C05B A2 10     LDX#$10     ;bottom line
C05D 20 FF E9  JSR$E9FF    ;clr one line
C060 CA        DEX         ;up screen to
C061 E0 0A     CPX#$0A     ;top line limit
C063 D0 F8     BNE$C05D    ;
home (originally at $E566)
C065 A0 0A     LDY#$00     ;cursor at
C067 84 D3     STY$D3      ;column 00
C069 A0 0B     LDY#$0B     ;
C06B 84 D6     STY$D6      ;row 11
C06D 60        RTS         ;
```

Locations controlling colours and modes follow. I haven't put them in zero page mode so that other addresses may be substituted. If these locations aren't set before activating the interrupt, the screen will probably

```
clear one line (orig at $E9FF)
C06E A0 20     LDY#$20     ;# of columns
C070 20 F0 E9  JSR$E9F0    ;set screen add
C073 20 24 EA  JSR$EA24    ;set colour add
C076 A9 20     LDA#$20     ;CHR$(32)
C078 91 D1     STA($D1),Y;clr screen byte
C07A 20 DA E4  JSR$E4DA    ;clr colour byte
C07D 88        DEY         ;clr next byte
C07E C0 0A     CPY#$0A     ;till column limit
C080 10 F4     BPL$C076    ;
C082 60        RTS         ;

Screen split:SYS49408 to activate

C100 78        SEI         ;preparation
C101 A9 7F     LDA#$7F     ;clear IRQ flag
C103 8D 0D DC  STA$DC0D;
C106 A9 01     LDA#$01     ;ready to detect
C108 8D 1A D0  STA$D01A;raster interrupt
C10B AD F8 00  LDA$00F8;set raster line
C10E 8D 12 D0  STA$D012;
C111 A9 1B     LDA#$1B     ;clr raster bit8
C113 8D 11 D0  STA$D011;
C116 A9 22     LDA#$22     ;IRQ vector
C118 8D 14 03  STA$0314;
C11B A9 C1     LDA#$C1     ;
C11D 8D 15 03  STA$0315;
C120 58        CLI         ;
C121 60        RTS         ;
C122 AD 12 D0  LDA$D012;compare raster
C125 CD F8 00  CMP$00F8;value
C128 D0 1F     BNE$C149;
C12A A9 00     LDA#$00     ;raster line 2
C12C 8D 12 D0  STA$D012;
C12F AD FC 00  LDA$00FC;top screen mode
C132 8D 18 D0  STA$D011;to bitmap
C135 AD FA 00  LDA$00FA;top border col
C138 8D 20 D0  STA$D020;
C13B AD FD 00  LDA$00FD;top screen col
C13E 8D 21 D0  STA$D021;
C141 A9 01     LDA#$01     ;IRQ occured
C143 8D 19 D0  STA$D019;
C146 4C BC FE  JMP$FEBC;exit
C149 AD F8 00  LDA$00F8;split raster
C14C 8D 12 D0  STA$D012;
C14F AD F9 00  LDA$00F9;bot border col
C152 8D 20 D0  STA$D020;
C155 AD FE 00  LDA$00FE;bot screen col
C158 8D 21 D0  STA$D021;
C15B AD FB 00  LDA$00FB;bot screen mode
C15E 8D 18 D0  STA$D018;to chars
C161 A9 01     LDA#$01     ;IRQ occured
C163 8D 19 D0  STA$D019;
C166 4C 31 EA  JMP$EA31;exit

Demo 10 FORI=0TO6:READA:POKE248+I,A:NEXT
     20 DATA150,0,2,20,28,11,6
     30 SYS49408:FORI=0TO1500:NEXT
     40 POKE248,200:POKE49451,100
```

turn to rubbish. STOP/RESTORE should get you out of it, but if it doesn't, you'll have to load the copy that you made sure to save. You did save one, didn't you?

00F8 248 line to split at (50-250)
00F9 249 top border colour
00FA 250 bottom border colour
00FB 251 top mode
00FC 252 bottom mode
00FD 253 bottom screen colour
00FE 254 top screen colour
C12A 49451 position of second raster

As examples, try 160,14,8,20,28,7 and 6 for the value of 248 to 254. Modes in this example are redefined/normal characters, the 20/28 being the values typically POKEd into 53272. Video banks can be changed at the same time as graphic modes, permitting an even greater number of screens. POKEing 49451 with a value >50<PEEK(248) will cause the screen to split into three zones.

With the values suggested, there is no flicker at all (not even when the keyboard is used), but moving raster1 close to raster2 will result in flicker as keyboard interrupts are processed. Changing modes when the raster is off-screen (in flyback) is the secret also of flicker-free scrolling.

If you use bitmap mode, don't forget that both D011 and D018 must be set. Space limitations don't permit inclusion of a listing for this, but if you would like one and/or a copy of a machine code monitor, please send a disk/tape, with return postage, to 6 Martin Ave, Mt Albert, Auckland.

Memory locations used are:

D012 53266 read/write raster value for compare IRQ
3011 53265 bit 7 is bit8 of raster value
D019 53273 VIC interrupt register (if bit0=1 then raster int)
D01A 53274 IRQ enable register
DC0F 56335 CIA int control register (if bit 7=1 then IRQ occured)

Rationalisation

Unisys, the company formed by the merger of Burroughs and Sperry Corporation, has already shut down two manufacturing plants as part of its rationalisation process. The closure of the Bristol, Tennessee, operation employing 1570 people and making computer systems, peripherals and printed circuit boards, and the 260-staff circuit board factory at Eau Claire, Wisconsin, follow the recent sale of the company's Memorex operations, Sperry Aerospace and Sperry Microwave in its restructuring to concentrate on information systems and defence.

And in New Zealand, where Compusales has for some time been undergoing the process of registering the brand name UNISYS for its trade union system, a legal fight is shaping up over its use. The offer of Burroughs (after initially denying that it was interested in the New Zealand single-screen microcomputer market) to buy the UNISYS name was turned down by Compusales, who then sought an interim injunction to protect its name.

That was rejected, the judge saying that while he was unwilling to speculate about the amount of damages which might be incurred by Compusales should the decision go against it, the company could not afford them. A full injunction is now being sought, while Compusales is continuing to proceed with the registration of its UNISYS trademark.

DOS for starters

A new Auckland fortnightly publication, The DOS Newsletter, is intended to explain the workings of the disk operating system on IBM compatibles to both first-time and more experienced users. It will also provide a source of reference in language that can be readily understood.

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Organizes the material in a format that is easy to follow for those new to database programs. Using dBASE II does pay careful attention to the order of learning this system. There's plenty of information to get one started, and the book should provide a solid foundation for later reading on the subject.

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Fancy a flight? by Bryce Utting

Each of the games reviewed here costs $79.95 from Sanyo dealers and comes from MichTron. I am also using Picasso and Freeze Frame, but will review them later in the year when I hope to have a joystick that works with Picasso.

DC-10

This flight simulator is written in BASIC and does not use graphics – all it has are instruments, some digital, some vaguely graphical. If it wasn't for this, it would be an excellent program.

The instruments themselves are reasonably well laid out, but the refresh time for the screen is in the region of two seconds. Each action requires two key presses – for example, throttle up is "T+ua" as the manual puts it – so it is at least four seconds before it becomes clear that the program has ignored your input, as it frequently does.

As is fairly typical for MichTron, the manual for DC-10 is superb. No less than 70 pages in length, it describes in detail the instruments, key sequences, how to land (it *tries* to make this easy, but the program itself makes landing extremely difficult, if not impossible) and take off, the basics of flight, and flying by navigational equipment. It also includes maps of the six airports, showing the position of the impressive number of navigational aids. If you can get past the horrendous user interface, you might start enjoying this program.

My conclusion is that while not up to the standard of Microsoft's Flight Simulator, DC-10 is a reasonable simulation up to a point. If you desperately want a simulator, try it out before buying.

Adventure Disk #2 and Adventure Disk #3

MichTron seems to want to keep it quiet, but these are the classic Mysterious Adventures from Brian Howarth (now writing for Scott Adams' Adventure International, as well as Tynesoft and others). There are five of his games on each disk (disk #2: Golden Baton, Time Machine, Arrow of Death Part 1, Arrow of Death Part 2, Escape From Pulsar 7; disk #3: Circus, Feasibility Experiment, Ten Little Indians, Perseus and Andromeda, Wizard of Akyrz), most of which appear occasionally in various publications in various English magazines in adventure columns. (I was completely confused with Wizard of Akyrz until a hint turned up in *Computer & Video Games*. BUT... can anyone tell me where the treasure store is... soon?)

The vocabulary of these games is reasonably extensive, covering most words a typical adventurer would use. Owing to the age of these programs (they first appeared around 1983) the input is restricted to two words in the "verb noun" format. Occasionally this format is broken (eg. "AT (deleted)" to throw the discus in Perseus and Andromeda) and this can cause a few problems at first. However, these programs are enjoyable and will keep a good many players busy for weeks – if not months.

Speed Racer

MichTron claims this to be a "Turbo type game." Turbo features a realistic background, racing cars that are trying to win, proportional steering, and obstacles. Given the high-res graphics of the MBC-550 (640 by 200 in eight colours with no colour restrictions) and the speed of its processor (a 16/8 8088 running at a reasonable 3.6 MHz) a game like Turbo should be possible.

Unfortunately, Speed Racer is very limited: it is fast, but the graphics are hopeless compared with Turbo and the other cars aren't even trying – they are just scattered around the track (no starting grid here), travelling at a fixed 55 mph. Given that your car can travel at 120 mph (and accelerate from 0 to 120 mph in 5 seconds if you know how), this game requires more dodging ability than true racing ability.

It does have some good points. Four different tracks are supplied, as well as a joystick/keyboard option (joystick is much better; both is... fun) and sound (to a point). A collision demolishes any other cars, but merely slows down your own. In the right frame of mind (and if someone else paid for it) it can be a lot of fun.

SPY vs SPY – The Island Caper

An Atari computer game review by Michael Fennessy.

This game, the second in the series of Spy vs Spy computer games, features those fighting, feuding spies from *MAD* magazine. When the title screen appears, up comes a volcanic island surrounded by credits. Then some of the credits disappear and the spies fly out and shoot holes in the title screen, following which the game completes loading. Before playing you may select various options, such as one/two players, various islands, or levels of intelligence for the opposing spy.

The object of the game is to find the three parts of a missile hidden somewhere on the island, to put these parts together and last of all get picked up by the submarine. The other spy has been given the same mission and you are involved in a race or a fight for the missile.

To help you kill, maim and injure the enemy spy, there are various weapons and booby traps, including snares, swords and a gun. There are also natural hazards such as a volcano, quicksand, sharks and of course the sea itself, as spies aren't very good at swimming. Overall Spy vs Spy – The Island Caper is a very good game; the graphics are good with smooth scrolling and realistic animation.

Don't be put off by your first encounter, as it takes quite a few games to get used to it. I was pleased with this game and found it entertaining and worthwhile. *MAD* fans especially will like this one.

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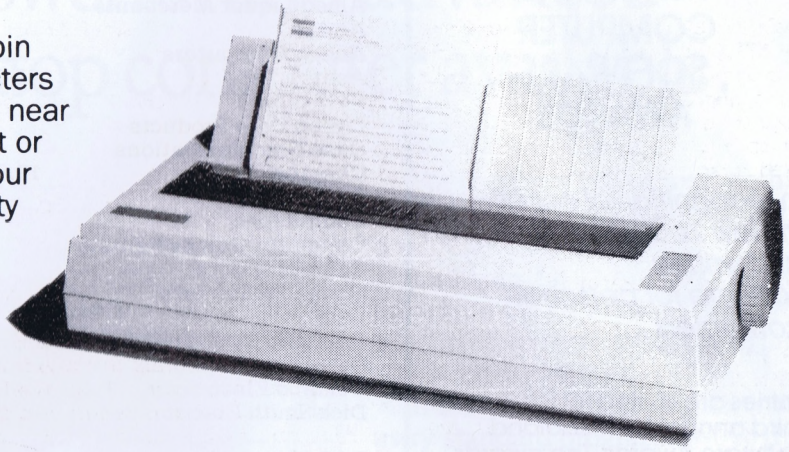
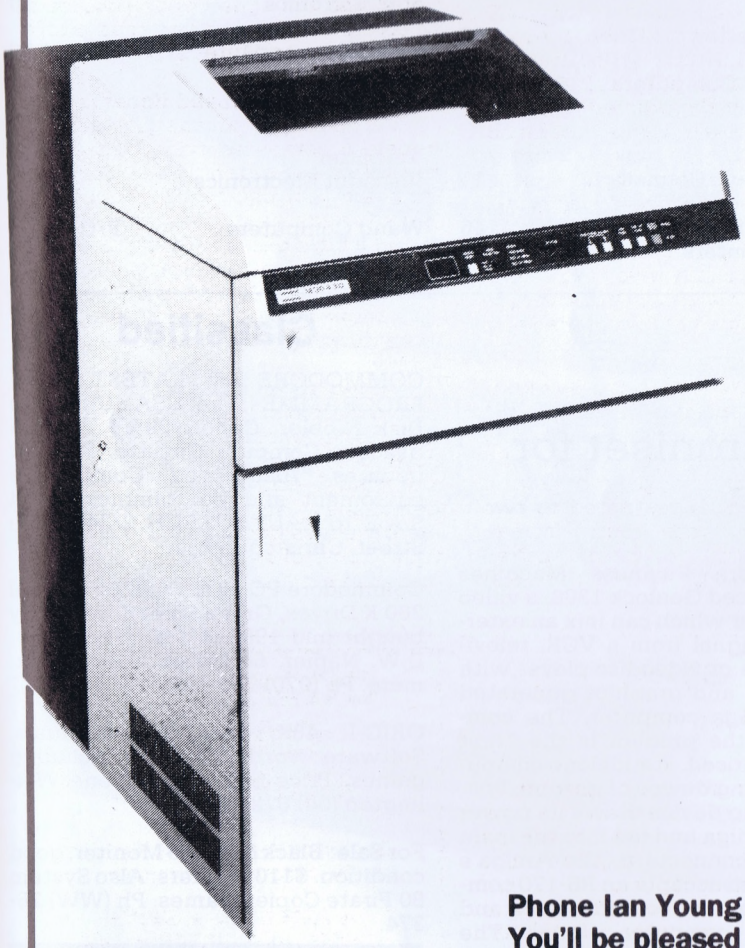
This is the Fujitsu DX 2100 9 pin printer which runs at 44 characters per second, produces draft and near letter quality print, can be sheet or continuous fed, will print in colour and is renowned for its reliability and quiet operation.





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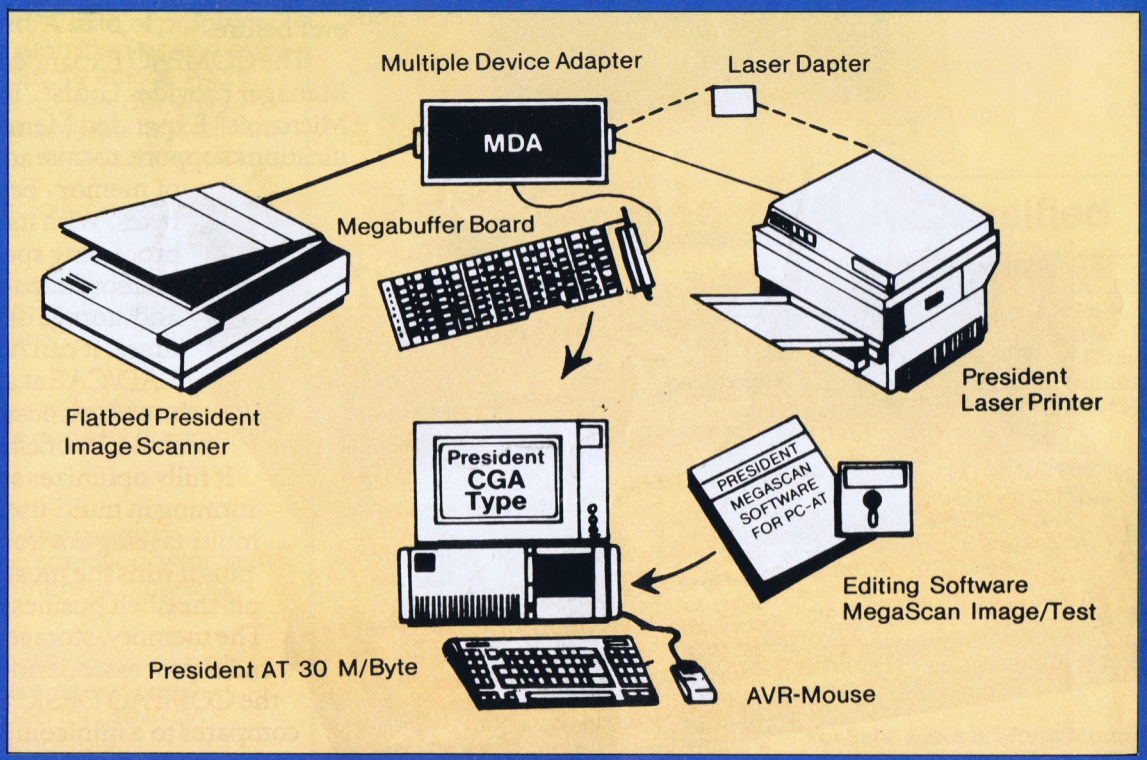

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