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AST RESEARCH INC

AST produce a range of IBM PC addon memory products which recently placed No. 1 in PC WORLD magazine user poll. These multifunction cards have memory from 64-512k as well as clock/calendar, Superdrive and Superspool software and extra serial, parallel and games output ports. AST also market full range of communication products such as IBM SNA, 3780, BSC and System 34, 36, 38 emulation cards as well as PC Net local area network systems.

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Rated No. 1 on "Softalk's" monthly rating of the best IBM PC software. With 1-2-3, you can be using your IBM PC in a surprisingly short time. Even if you've never been near one before. 1-2-3 instructs you right on the computer's screen in a friendly, helpful way, so you learn as you go along. Everything is in English, not code, so there's no new language to learn. There's even a special HELP key you can press to put special instructions on the screen if you can't remember what to do next. But for all its comforting ease of use, 1-2-3 is one of the most powerful programs available for the personal computer. It combines spreadsheet, information management and graphics all in one.

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The easy to use financial analysis and budget forecasting system written in Australia to our local business specifications. These packages have also received high acceptance in the USA as business planning packages that are easy to understand and extremely valuable in their ability to prepare spreadsheet data for packages such as 1-2-3, Visicalc and Multiplan.

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Sourceware carry a full range of business graphics packages for both dot matrix printers and colour plotters.

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PROKEY	Keyboard programming utility
SIDEWAYS	Vertical print utility
APL PLUS*PC	APL programming language for the IBM PC
★CROSSTALK	Communications and terminal emulation program

HARDWARE

IRMA BOARD	IBM 3278, 3279 terminal emulation card
PCI 1051	IBM SYS 34, 36, 38 – PC interface
PCI 1076	IBM SNA/SDLC – PC interface
SWEET-P	12 Colour graphics plotter

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The Source of Software

S07.FPC

inside your computer
Vol. 3, No. 6,
January, 1984

special

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Bits Missing
Les Bell managed to get his 'dBase' copy to us for this issue, but Christmas still caught him out with his tutorials on assembler and logic. Never fear, they'll be back in February!

editorial

The recent decision by Justice Beaumont in the case Apple Computer Inc. and Apple Computer Australia Pty Ltd v. Computer Edge Pty Ltd and Michael Suss has left the personal computer industry in a state of turmoil. Without going into the details, the basic situation is this:

Apple brought suit against Computer Edge, importers of a Taiwanese-made micro called the Wombat, charging that the ROMs in that machine contained copies of two programs written by or for Apple (Applesoft BASIC and the Auto-Start ROM), and that such importation was in contravention of the Copyright Act of 1966. There was also an associated claim under the Trade Practices Act, but the consequences of that charge being dismissed are less significant and I won't discuss them here.

In his judgment, Justice Beaumont reduced the problem to these components:

The key to the problem is the status of the alleged 'works', Applesoft BASIC and the Auto-Start ROM, both in their original form as source code pencilled on paper and in their later form of charge pools in an EPROM, having been placed there with the aid of an assembler program and EPROM programmer, with respect to the protection afforded by the Copyright Act.

The first thing that must be resolved is whether each of these works is a 'literary work' within the meaning of the Act. Then the remaining issues, such as whether Apple is the owner of the copyright, can be successively dealt with.

Justice Beaumont found that computer programs are not literary works within the meaning of the statute, quoting extensive precedents for this view. In particular, he pointed out that when Parliament revised the Copyright Act to cover films and sound recording, it did not include computer programs, although computers were well known at the time. Therefore the copyright claim was dismissed with costs.

This now leaves us in the situation of having no copyright protection for software authors in Australia. The consequences of this decision are not yet clear, but already ripples are spreading on the surface of the pool.

Word reached the US computer industry at the Comdex show in Las Vegas, where a substantial amount of innovative software for personal computers was being displayed. Almost to a man, software developers said that under no circumstances would they allow copies of their software near Australia or an Australian. While this may be a knee-jerk reaction, a real possibility exists that Australian computer users and developers may be denied access to significant software developments. That could cost industry millions of dollars.

Local software authors were still writing code, but were extremely concerned about the situation and were actively seeking alternative means of protection, such as licence agreements. However, such agreements are of doubtful use, as no contract exists between a supplier and the holder of what would previously have been a pirated piece of software. He did not buy *the software, but he did not (necessarily) come by it illegally.*

A further difficulty exists for local manufacturers of machines which use US-supplied operating system software. Manufacturing licences for such software usually include a clause requiring the manufacturer to vigorously prosecute any piracy or unlawful copying. But right now there is nothing to prevent anybody copying the operating systems from such machines and selling them, placing the original manufacturer under legal pressure from the US. If I were a US software house, my solution — in the short term, at least — would be to refuse to licence or supply Australian manufacturers. I couldn't afford to place my business at risk.

It is obvious from this that we are very close to reducing the local software and hardware industries to tatters. We are totally dependent on software technology which is now valueless — how can I charge for software when you are legally free to copy it? — and to a considerable extent reliant on software from the US. The average Silicon Valley programmer probably regards us as legal barbarians, and I can't really blame him.

If the Government is really serious about supporting the Information Technology industry (their capitals), then the Attorney-General should move quickly to rectify this situation, either by amending the Copyright Act to cover software, or by the introduction of a special Bill.

While it may be better to have a special Act to cover illegal copying of computer software, it seems intuitively obvious — to someone who has done it — that writing computer software is not that much different from writing poetry. Non-programmers may scoff, but there is considerable art, as well as science, to programming. Until our legislators are sufficiently computer literate to appreciate this point, they may well think in terms of special laws for software, but I suggest that amending the Copyright Act would be a lot faster — an important consideration — and quite appropriate.

Apple may, of course, appeal against Justice Beaumont's decision, and that may give rise to a resolution of the current situation. That possibility notwithstanding, we now know that we need proper legislation to protect the rights of software authors and those to whom they sell their products. Incidentally, isn't it interesting that we naturally refer to programmers as software authors?

— Les Bell

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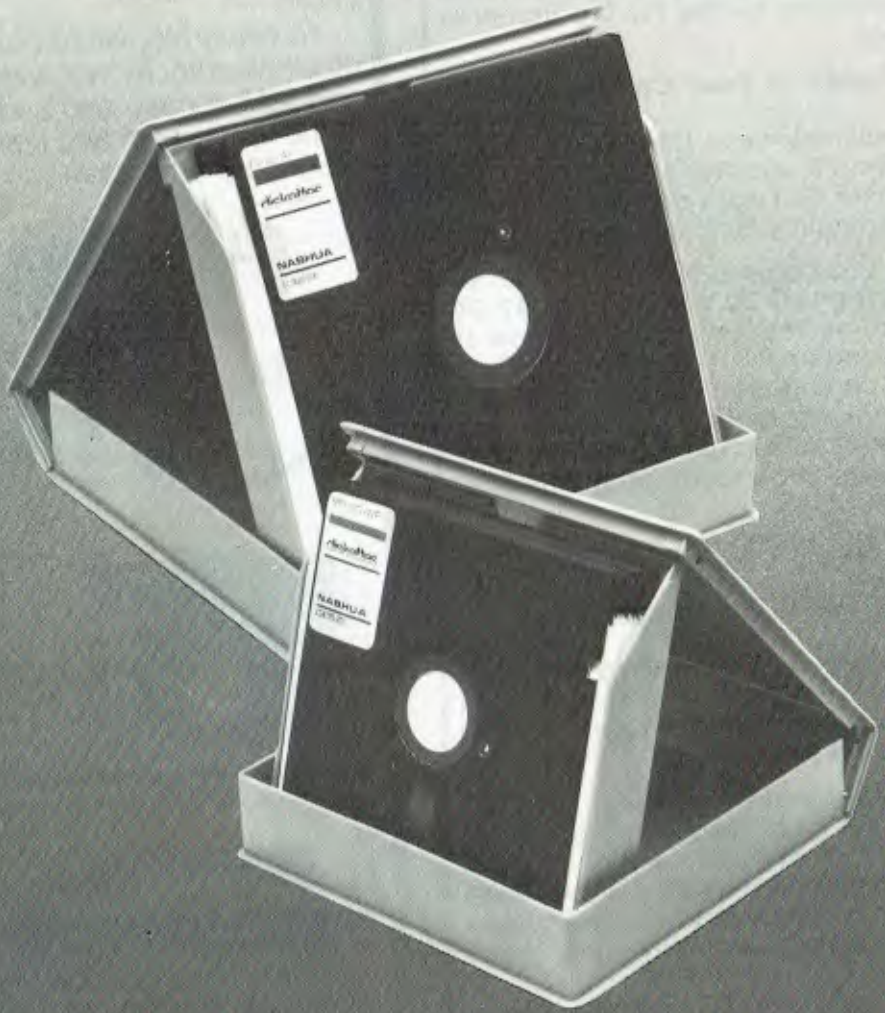

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your computer news

Westpac's 'Handyway' electronic funds transfer system.

More Plastic Money

THE CHIEF EXECUTIVES of Westpac, Woolworths, BP Australia and Food Plus recently announced the creation of Handyway, the world's first nationwide retail electronic funds transfer system.

Handyway will allow customers of these outlets to pay for their purchases with a plastic card. When a customer pays through Handyway the amount of the transaction will be deducted automatically from a cheque or Advantage Saver account and credited to the account of the store or service station.

Westpac will commence installation of the Handyway terminals in approximately 500 Woolworths stores, all Food Plus convenience stores and about 450 BP Service Stations from April, 1984. Sites will be limited to Sydney and Melbourne metropolitan areas initially; however, expansion into other states and country areas is planned to be completed by March, 1985.

Ericsson Australia is designing the terminal to Westpac specifications and it will be manufactured locally at their Broadmeadows factory.

Telecom's new Austpac network will be the vehicle used for connecting the terminals to the Westpac processors.

A spokesman for Woolworths said, "The major benefit to our customers will be the elimination of the need to carry large amounts of cash to do the weekly shopping, and at the same time the ability to draw additional cash from the checkout up to a specified limit." ❑

Apple Software On Your IBM-PC

ADE HAS been appointed Australian and New Zealand distributor for the range of Quadram products for personal computers. Possibly the most significant product is Quadlink, a new board designed to allow Apple software to be used in the IBM Personal Computer.

Quadlink is claimed to be functionally equivalent to an Apple computer on one board, and once installed in one IBM-PC expansion slot it can access and execute Apple-compatible software without requiring disks to be converted or reformatted.

Quadlink comes with 64K of memory, a game port (compatible with both Apple and IBM-PC), and a display adaptor offering five display modes, including high-resolution graphics.

Quadram's 'Quadboard' can solve a major problem of many IBM-PC users by taking six PC functions and combining them onto one board requiring just one expansion slot. This leaves four of the five IBM slots open for other expansion.

Quadboard contains an RS232C async communications port, a Centronics parallel printer port, up to 256K of RAM chronograph (clock-calendar), QuadRAM drive (RAM disk) and spooler.

A similar board, the Quadboard II, combines two serial ports, chronograph, memory expansion, RAM disk and spooler. The Quadboards come with one-year warranty.

Another Quadram product, the Microfazer, serves as a buffer to take over a printing task without tying up computer time. It has a full half-megabyte memory, and thus is capable of significantly increasing the productivity and efficiency of microcomputers.

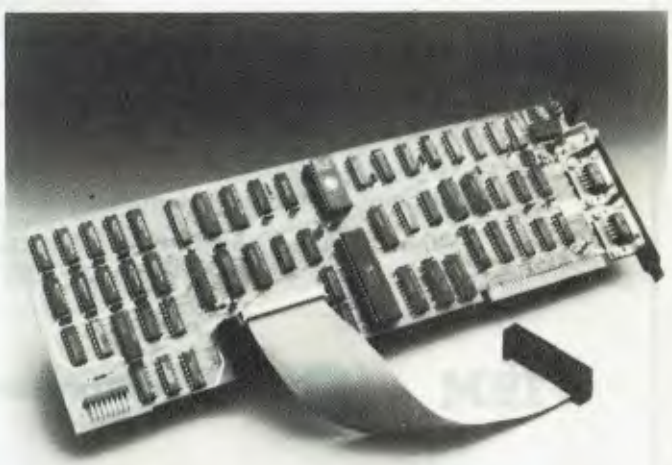
Microfazer is not permanently attached or configured for any specific printer, nor is it dependent on any single computer.

ADE is also convinced that many computer users, especially in business, will soon make the switch to colour monitors, since colour makes the impact of graphics presentations that much more effective.

ADE is therefore offering an Intecolor 2405D single evaluation unit for $1495 plus tax – one only can be purchased per customer, and the offer is good till January 31, 1984.

The Intecolor 2405D is said to be ideal for business graphics, industrial automation and graphical analysis control, and is an ANSI 3.64 DEC-compatible terminal. Other features include terminal-based vector graphics, thin-line graphics, two pages of display memory, programmable function keys, and a user friendly set-up mode.

For more information on all these products, contact Anderson Digital Equipment, 14 Whiteside Rd (PO Box 422), Clayton 3168. (03) 544-3444. ❑



The Quadlink board installs in an IBM-PC, giving it the ability to run Apple programs.

The IBM Personal Computer Dealer of the Month Award, won twice in six months by HiSoft.

HiSoft Wins Again

HISOFT, a Melbourne company, has won the IBM Personal Computer Dealer of the Month award for the second time in less than six months. The company also topped the volume list, selling more IBM-PCs in October than any other company in Australia.

The IBM Dealer of the Month award is made to the company which has the largest percentage increase in sales, based on its performance in the previous three months. ❑

Multi, Plus And Integrator

SCA SOFTWARE CORPORATION has released three new software packages. The first is a new version of MultiMate, a program designed to bring a Wang-like dedicated word processor to IBM-PC users. There's a long list of enhancements said to have been incorporated in MultiMate Release 3.20. One of these is Speller, a spell-checker/corrector with a dictionary of some 80,000 words. The new MultiMate costs $595 (plus sales tax).

WordPlus-PC is another new word processing package, available for the DEC Rainbow, the Texas Instruments Professional computer and the IBM-PC. Said to be one of the most easy to use word processors, WordPlus-PC has a merge capability which allows the user to send personalised standard letters to large numbers of addressees. It also has a complete range of word processing functions and is available with The Boss, an on-line spelling check function containing an electronic dictionary of around 90,000 words. On its own, the WordPlus-PC retails for $395 (plus sales tax), with The Boss the price is $525.

The third new package is Data Base Management II, a data base management program designed for inexperienced computer users. For use on the IBM-PC, DBM II is said to be completely compatible with Lotus 1-2-3, MultiPlan, VisiCalc, WordStar, WordPlus-PC and other popular programs. Recommended retail price is $395 (plus tax).

For further information, contact SCA Software Corporation, 449 Swanston Street, Melbourne 3000. Phone: (03) 347 7011. ❑

All functions of the Intellect 100 image processing system are controlled from a simple keypad with clearly annotated keys. The system accepts a range of video inputs and includes recursive video processing facilities to improve on-line images. The hardware comprises a framestore and image processor housed in the plinth beneath the terminal, which contains its own microprocessor. Data can be transferred at 100K per second between the image memory and the microcomputer memory. Two cartridges of 256K capacity each are used for program loading and picture storage.

Sensible Programming Language

THE SENSIBLE SOLUTION is an applications programming language for microcomputers, now available in Australia through Fletcher DP Services.

Manufactured by O'Hanlon Computer Systems, The Sensible Solution is said to solve "the historical problems of writing interactive programs." Its capabilities range from that of application generator through to that of a comprehensive procedural programming language. Features include: Multi-file relational data handling, interactive full screen data entry and updating, multi-index B-tree datafile management, true multi-user facilities with record and file locking, auto code generation, Report Writer and Inquiry Facility.

Fletcher DP Services is using The Sensible Solution to develop new vertical market systems. Current vertical market packages cover radiology, newsagencies, publishing, membership management and inventory control.

The Sensible Solution will run under CP/M, TurboDOS, MSDOS, MP/M, MmmOST and DPC/OS. A minimum of 48K RAM is required along with 300K+ disk capacity. The price of the language is around $750 (including tax). For further information, contact Fletcher DP Services, First Floor, 320 St Kilda Road, St Kilda 3182. Phone: (03) 537 2811. ❑

The Roland DXY-101 one-pen plotter (standing), and the DXY-800 eight-pen plotter.

Roland Moves Into Computer Market

THE ROLAND CORPORATION, which claims to hold 70 per cent of the Australian musical synthesiser market, has now set up a computer division, and has entered the market with the release of several monitors and two plotters.

The Amdek 300 and 300A monitors (green and amber screen respectively) are claimed to be compatible with virtually every computer or word processing system, and have a non-glare silk screen that allows strain-free viewing without distracting reflections. The 18 MHz bandwidth and 900-line (centre) resolution ensure that the image is clear and stable, with a 210 by 158 mm display screen.

The Amdek monitors come with a one-year warranty on parts and labour, and have a recommended retail price of $325.

Roland will also be marketing the Roland DG MB-122G and 122A monitors, which are fully compatible with the IBM-PC, and two colour monitors with either RGB system or composite video display.

The plotters being marketed are the eight-pen, multi-colour DXY-800 model and the DXY-101 single-pen version. They have both RS232C serial and parallel interfaces built in, and can accept serial input at eight different baud rates, which makes them compatible with virtually any personal computer, according to Roland.

Designed for A3 format, the plotters can operate in a flat or standing position, and can print on matt or gloss papers or on clear film.

The command structure is in BASIC, but the plotters will also accept ASCII code. Arcs, circles and alphanumeric characters are built into ROM, forming part of the command structure and thus removing the need for further programming. Fourteen control commands are included, along with vector commands for plotting and tabulating, drawing continuous lines, dotted lines and co-ordinates.

The plotters also come with Roland's standard one-year warranty, and Roland states that its emphasis is on quality. The company aims to supply the best value for each product in its price range, and to build a long-term relationship with its dealers.

For more information contact Adrian Stephens at Roland, 39 Victoria St, Fitzroy 3065. (03) 417-1800. ❑

An Adam For The Colecovision

CBS RECENTLY demonstrated an upgrade for the Colecovision that brings it to the standard of a home computer. Called the Adam, it is dependent on the Coleco for operation and comprises a CPU and keyboard, dual cassette drive and letter quality printer. The system should be available in April.

The Adam plugs into any television set through the Colecovision system and has a screen size of 36 characters by 12. Using a Z80 microprocessor, the Adam runs its own version of BASIC, called SmartBASIC. The keyboard is a standard qwerty with six function keys and other special purpose word processing keys.

The system runs games software, a word processing package and supports typing direct to the printer. It is menu driven, with a high level of user friendliness.

The most outstanding feature of the system is the built-in letter-quality printer. This uses a daisywheel, typing bi-directionally at 10 cps. Its only drawback is that it is very noisy.

The word processing package operates through easy to follow menus and includes the ability to create windows in text for graphs. The printer is not able to reproduce graphs, but the computer does support graphics commands and colours.

The Adam system will retail for about $1000, a price which includes the printer, 64K RAM CPU and dual cassette drive. To this you must add the cost of the Colecovision (around $249), without which the system will not work.

It is expected that the machine will soon undergo upgrades to permit the use of modems and disk drives for which there are no interfaces at present. ❑

The new Adam/Colecovision family computer system.

World Modem

DATA SAT will release an enhanced version of its World Modem PSTN1 in the first quarter of 1984.

To be known as the World Modem PSTN-1E, the new modem's features include: two programmable connection modes (CCITT V24 108.1 and 108.2); two connection routines in each mode; five disconnection routines; seven status indicators; four modem standards; automatic answering, utilising existing software; selectable auto or manual connection; and dial pulse and busy tone exclusion routines.

The PSTN-1E was reviewed in *Your Computer*, November 1983. For further information, contact Data Sat, Suite 5, 522-524 Kingsway, Miranda 2208. Phone: (02) 525 6688. ❑

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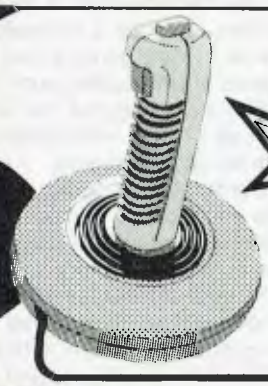

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Cheque/Money Order enclosed. Add $2.00 P. & P.

The Fortune 32:16 computer from Datacraft Systems.

Fortunes For Sale

DATACRAFT SYSTEMS, a new entry into the office automation market, recently opened its first Australian offices at 59 Burwood Road, Hawthorn, in Melbourne.

Datacraft's main computer product is the Fortune 32:16 computer system. The company describes the Fortune 32:16 as a simple to operate integrated package, whose closest equivalent is perhaps the Wang office system.

The machine uses a 'friendlier' version of the Unix operating system and has a specially designed dual bus structure and memory management unit designed to maximise the performance of Unix software on Super Micro hardware.

Fortune configures the 32:16 as either a professional system with up to three workstations or an extended performance system for up to ten users.

Configurability spans up to one megabyte of main memory, 120 megabytes of hard disk, cartridge tape back-up, IEEE 4888 interfaces and multiple printer interfaces. Each terminal can connect a printer.

System software products available for the Fortune 32:16 include a range of relational database managers and high level languages (C, ANSI COBOL, C BASIC, SMC Business BASIC, FORTRAN 77, Pascal and APL). Proven software also extends to a range of conversion aids and emulators for several popular systems, financial modelling systems, and communications facilities including asynchronous, batch bisynchronous, interactive bisynchronous (3274/5/6 emulation) and networking.

In applications, Datacraft has a range of Australian packages running on the Fortune 32.16, including business accounting modules, production systems, share register and purchase management.

Fortunes to be spent range from under $12,000 for a basic system up to around $31,000 for a four-workstation system. ❑

Think Computers!

?THINK COMPUTERS (we don't know why the question mark's there, but there it is – it's not a typographical error) opened a new demonstration and conference facility in Mitcham, Vic, at the end of November, the official opening being conducted by Ken Barelli, Mayor of Nunawading.

According to Peter Horsley, ?Think Computers' marketing director, the company has a policy of employing only computer professionals with experience in running their own business, in order to ensure its ability to help to the full business people trying to computerise.

As well as supplying computers to the business community, ?Think Computers will be specialising in networking and communications, and running various seminars at its conference facility.

?Think Computers is located at 602 Maroondah Hwy, Mitcham 3132. (03) 873-1122. ❑

Datec Forecasts Continuing Growth

SHORTAGES OF COMPUTER STAFF are down to about nine per cent, and turnover has slowed from in excess of 20 per cent in 1981-82 to 13 per cent in 1983 – according to the Annual Forecast for Australian Management, presented by managing director of Datec, Harry Douglas.

The Datec Forecast covers nine sections, including a public interest survey on microcomputers. According to the Forecast, the compound growth rate of business microcomputers over the next two years will be 80 per cent, and this segment of the market is buoyant. Hardware growth indicates a rise of 227 per cent in the demand for micros between 1983 and 1985, 40 per cent for minicomputers and 18 per cent for mainframes. Over the next 12 months, uses of micros are expected to be: Calc/spreadsheets, 77 per cent; word processing, 76 per cent; communications, 54 per cent; graphics, 49 per cent; data base management systems, 40 per cent; and other, 23 per cent.

Large organisations with turnovers in excess of $500 million which already had 70 business micros would increase these in two years to more than 250, and some responses indicated they would have thousands by 1985.

The IBM-PC has been adopted as a de facto standard by 24 per cent of users and an increasing number of users over the next two years would require IBM-PC compatibility as standard.

In other areas the survey said: almost one third of all new systems developed will be handled by packages; information systems managers in Australia are slowly being recognised for their importance in terms of the overall success of a company; information centres are increasingly being designed to give users tools such as fourth generation languages to overcome work backlogs; and the cost of linking equipment is still a major barrier to office automation. ❑

Do-It-Yourself Programming

THE I.M.A. COMPUTER COMPANY has released a program generator, called Codewriter, which allows beginners to learn to design programs with a minimum of instruction.

Said to be compatible with most leading small business computers, Codewriter requires only that you be able to type the information you want on the screen in your own language.

Codewriter guides you step by step and on completion of your design it writes the program, codes and stores it on your disk. The program may then be called up for you to enter data, search randomly or sequentially, and update information. You can also modify the program at any time.

I.M.A. has also released Dietary Planning, Health and Fitness software – software which addresses the relationships between a balanced diet, activity and exercise levels. Dietplan is based on the personal details of individuals and produces significant quantitative information to assist the health care professional in helping people become slim and healthy.

For further information, contact I.M.A. Computers, 296a Canterbury Road, Surrey Hills 3127. Phone: (03) 836 8835. ❑

Briefly . . . Briefly . . . Briefly . . . Briefly . . . Briefly . . . Briefly . . . Briefly

■ Select MicroSystems, a personal computer dealer for Digital Equipment Corporation in Australia, has announced availability of the Lotus 1-2-3 software package for use on DEC's Rainbow 100 Personal Computer. When used in conjunction with DEC's graphics option, Lotus produces business graphics at a resolution of 800 by 240 pixels. For further information, phone (03) 267 1255.

■ A network of 'talking' word processors being developed by Britain's Open University may soon enable blind people to handle their own correspondence. Letters composed with the equipment appear as either printouts for sighted people or are stored on floppy disks, which are then mailed to other blind users whose talking word processors can read the communication to them.

■ Digital Equipment Corporation has announced the Rainbow 100+, a new computer with an integrated ten megabyte Winchester hard disk, 128K of system memory (expandable to 896K), Z80A and 8088 microprocessors, dual floppy diskette with 800K capacity, built-in terminal emulator and a printer port. A complete Rainbow 100+ system sells for $9427. Digital has also introduced hard disk upgrade kits for the Rainbow 100 and new versions of MS-DOS and CP/M-86/80. For further information, phone (02) 412 5252.

■ Gareth Powell has announced the launch of the *Australian Apple Review*, a magazine devoted entirely to Apple computers and their uses and users in Australia. Apple Australia supports the magazine, but *Australian Apple Review* takes pains to point out that it is an independent magazine. Many aspects of Apple's operations are questioned and criticised: the first loyalty is to the buyer, not the seller. The magazine will be published bi-monthly until early 1984, when it will become a monthly publication. The cover price is $3. For further information, phone editor Graeme Philipson on (02) 398 5111.

■ A joint venture has been announced between Sony and Philips to develop a basic format for compact optical disks which will store from 500 to 1000 times more digital data information – equivalent to approximately 12,000 A4-sized sheets – than present 13 cm magnetic floppies. Based on optical disks designed for music players, the two audio channels would be used for digital data recording and could be plugged into computers. The disks cannot be reprogrammed, but could be used for data filing and long-term storage.

■ Claimed to be the first device of its type available in Australia, the Case 1212 combines error correction, auto answer and auto-dial facilities with a full duplex 1200 bps modem in a compact unit. Compliant with international standard CCITT V22, the 1212 operates either synchronously or asynchronously at 1200 bps full duplex on two wire leased or dial-up circuits. The 1212 is Telecom approved for use on the analogue data service and public switched telephone network, and costs $1490. For further information, contact David Hoad on (02) 451 6655.

■ Novation, a modem manufacturer, has introduced its PC1200B and packaged it with Crosstalk XVI, from Microstuf, to create a data communications package for the IBM-PC, IBM-XT, Columbia MPC, Columbia Portable, Corona PC, Corona Portable PC and Compaq. The complete system, including modem, software and documentation, carries a suggested price of $595. While the PC1200B has an extensive set of commands and responses that provide telephone line status, the Crosstalk software employs this smart modem to accomplish auto-dial, auto-log-on and auto-answer, and allows for disk-to-disk transfer of information. For further details, phone US number (213) 996 5060.

■ Insystems of Melbourne has announced the national distribution of Fastbase, a product designed to assist novice users of dBase II to develop screens more quickly and easily. As a user creates a screen, Fastbase will automatically generate the equivalent dBase II command files for file maintenance, record searching, screen input and printing forms. File records can apparently be reorganised, modified or deleted by the user as desired.

■ Every viewdata set has become a potential personal telex transmitter as a result of new development work by British engineers. Britain's viewdata system, known as Prestel, uses an ordinary telephone line to link purpose-made Prestel sets or adapted domestic TV sets to a vast central computer bank of information, ranging from weather forecasts to the latest financial news. Special telex message pages have been added to the service to enable messages to be sent to any telex machine in the UK. British Telecom says there are plans to extend the service to cover Europe and the rest of the world. The most expensive Prestel set with keyboard costs under $1600 in the UK, while adaptors for domestic television sets can be as little as $272. A Prestel set can be connected for $24, compared with $320 connection charge for a telex terminal.

■ The Apple graphics tablet, an electronic drawing board for creating computer graphics, is now available through authorised dealers for around $995. The tablet can be used with Apple II, Apple II Plus and Apple IIe computers with 48K or more of internal memory and a floppy disk drive. Users can develop and display block diagrams, architectural designs, logic diagrams, mechanical art, engineering schematics and graphic art, in six different colours. Designs can be saved on diskette and recalled for review or revision. Printing of designs is possible if the graphic software package being used permits it. For further information, phone (02) 888 5888.

■ A disk drive system that will enable Apple II Personal Computers to run software programs based on the widely used MS-DOS operating system was announced recently by Rana systems and Apple Computer. The Rana 80862/2 is a plug-compatible co-processor and dual disk drive system for Apple II computers. It uses an 8086 microprocessor, with a double-sided drive providing 360K of storage per drive. The co-processor portion will provide 256K of main memory, expandable to 512K. The system will be available by March 1984.

■ Following an exchange of contracts between the two companies, Datronics has assumed responsibility for the provision of service to all Anderson Digital Equipment customers in Australia. These responsibilities include remedial and preventive maintenance services for products supplied by Anderson Digital Equipment, the stocking of spare parts and the employment, training and support of current Anderson Digital Equipment engineering personnel. For further information, phone (02) 887 9333.

■ Nippon Data General has developed an office system using the company's minicomputers and personal computers, linked by optic fibre, for integrated compilation, storage and transmission of documentation generated in an office. A special feature of the 'CEO' is its ability to handle six languages; Japanese, English, French, German, Italian and Spanish. A wide range of DG computers is suitable for use in the system, from the Eclipse MV/10000 32-bit super-minicomputer to the Desktop Generation 16-bit personal computer. A total of 100 terminals and 30 printers can be incorporated into the system.

■ Data General recently announced a new multi-workstation microcomputer, the Eclipse C/30 system. Based on the microEclipse semiconductor technology, the Eclipse C/30 system is supported by a choice of AOS, RDOS and MP/AOS. In business environments, users have access to a range of integrated data processing, data communications and CEO office automation functions. The Eclipse C/30 can be used as a stand-alone system or as part of a distributed network with larger 16 or 32-bit systems or IBM mainframes. An Eclipse C/30 with 512K of memory, in an 8-slot chassis, is priced at $14,200. A C/30, AOS-based system configured with 512K of main memory, a micro BMC, 50M Winchester disk, 15M tape cartridge, a Dasher D410 workstation, cabinet, licence for the AOS operating system and nine software entitlements is priced at approximately $46,000. For further information, phone (03) 831 3311.

A deaf person communicates using an Acorn microcomputer.

Computers To Help The Handicapped

MAINCOMP, a British computer company, is developing packages specifically to help blind, deaf, dumb and spastic people to work from their own homes.

One system allows deaf and dumb people to make telephone calls. The user types the message into the computer and then dials the telephone number to which the message is to be sent. When the telephone is answered, the encoded message is sent down the line by a synthesised voice. Provided the respondent has a similar system, a reply can be relayed, via the telephone line, to appear on the user's screen.

The picture shows a typical arrangement for a deaf person. The operator can see her voice pattern on the screen as she speaks into the microphone and can adjust sound level accordingly. She can relay her message either by speech or data, by typing on the keyboard. Replies to her telephone calls can be displayed on the screen and on printout and all conversations can be stored on floppy disk for future reference. ❑

New 'Children's Workshop' software and 'kids' controller' from Atari.

Cookie Monster Enters The Computer Age

FUTURETRONICS has launched a series of video games cartridges for the Atari 2600, designed for children between the ages of three and seven.

Intended to help children take a confident first step into the computer age, the software has colourful graphics and was designed in conjunction with a division of the Children's Television Workshop of the USA, the makers of 'Sesame Street'.

The games use Sesame Street characters to encourage children to practise learning skills such as letter matching and problem solving. Each game has multiple skill levels and can be played by one child or more.

The packages include 'Big Bird's Egg Catch', in which a chicken lays eggs in a hayloft and the objective is for Big Bird to catch the eggs as they roll down along maze-like shutes. Big Bird has to be moved right and left, catching the eggs in a basket on his head.

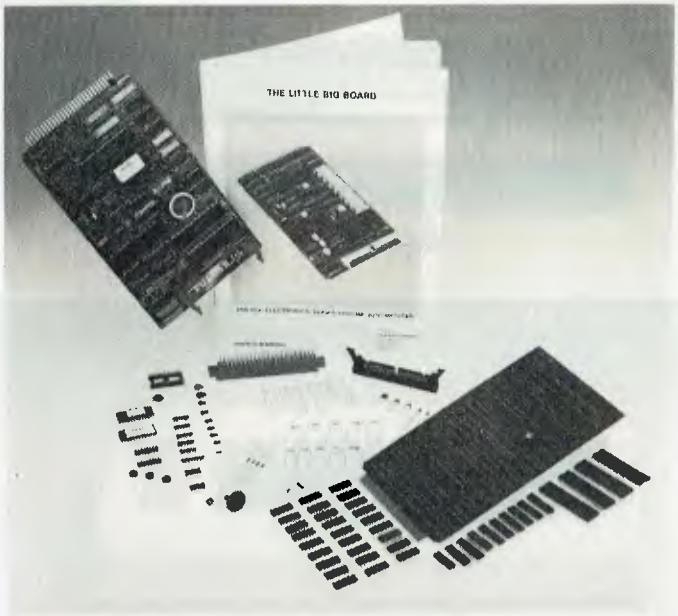
In 'Alpha Beam With Ernie' the object is to pilot a shuttle craft to a re-fuelling zone by loading his rocket with different lettered tanks and making it blast off. The object of 'Cookie Monster Munch' is to pick up cookies in a series of mazes and put them in a cookie jar.

Atari has also released a special children's keyboard with large, clearly marked key-pads. For further information, contact Ron Ward, Futuretronics Australia, 1076 Centre Road, Oakleigh 3167. Phone: (03) 579 2011. ❑

Kids' Computer Workshops

COMPUTER WORKSHOPS will be holding week-long courses for late primary and early highschool students with little or no computer experience at the University of New South Wales in January, 1984. Unfortunately, their press release reached us too late for us to tell you about their plans before the closing date for applications (December 2, 1983).

However, mention was made in the belated release of similar workshops to be held in the May school holidays. Assuming information on that will again miss the appropriate deadline, we're passing on the Computer Workshops' contact number now, so interested parents and students can find out the details themselves. Phone (02) 357 2877 during business hours or George Newhouse on (02) 327 6657 after hours. ❑



The Little Big Board is now available in kit form.

Little Big Board As A Kit

LITTLE BIG BOARD, the Australian-designed single board computer on the STD bus is now available in kit form.

Provided on-board is 64K RAM, a real-time, battery-backed clock and calendar, two RS232 I/O ports, a disk controller for 20 cm or 13 cm disk drives, and 2K EPROM.

The source listings to the CP/M 2.2 Bios and pulsar utilities are provided along with all circuit diagrams. For further information, contact Pulsar Electronics, Lot 2 Melrose Drive, Tullamarine 3043. Phone: (03) 330 2555. ❑

Sharp PC-5000

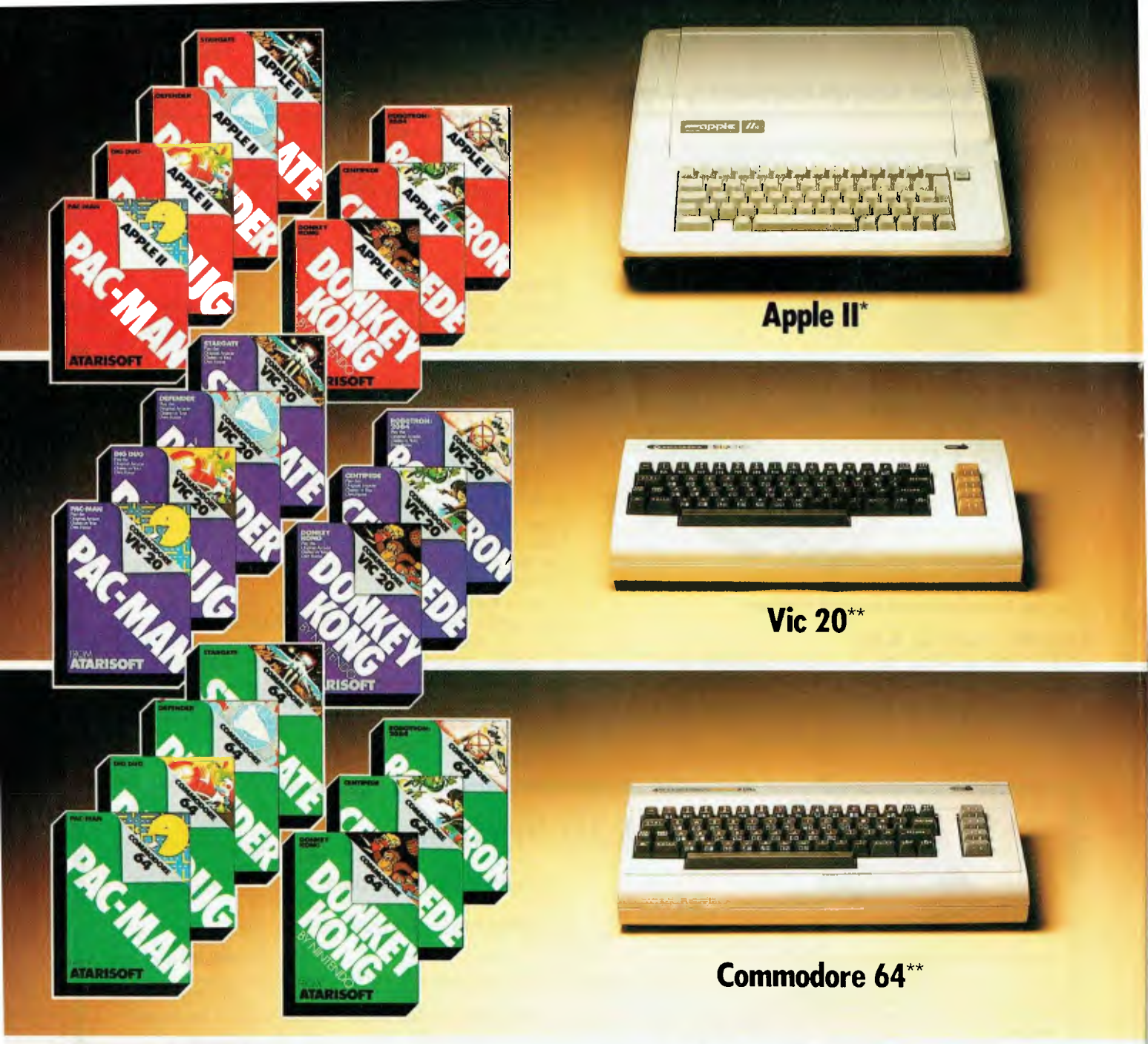
SHARP HAS launched the PC-5000, a new portable computer which offers full 16-bit operation and large memory, yet is small enough to fit into a briefcase and run for up to nine hours on its built-in batteries.

Externally resembling a small portable typewriter and weighing only 4.5 kilos in its basic form, the PC-5000 has a full-sized keyboard and an eight-line by 80-character display. Towards the rear of the machine, roughly where the platen of a typewriter would be, a printer may be built-in as an option.

Internally, the unit has an 8088 16-bit processor with 128K of RAM (expandable to 256K), 64K of ROM and, under a flip cover just above the keyboard, space is provided for optional 128K bubble memory modules. Two additional ROM modules can be plugged into the base of the machine, giving a total of 192K.

While the PC-5000 is able to run a range of general applications under its industry standard MS-DOS 2.0 operating system, it is expected to be particularly popular with surveyors, geologists, accountants and other professionals who work in the field where a full-sized computer is not available.

For further information, contact John Kouvelis or Tony Prince, Sharp Corporation, PO Box 233, Fairfield 2165. Phone: (02) 728 9111. ❑



Now you can play the smash Atari® arcade hits on your Apple II*, Vic 20** or Commodore 64**.

The graphics are great, the gameplay is fantastic! Atari arcade hits are so popular everyone wants to play them at home. And now you can! Atarisoft™ brings the Atari arcade hits into your home by developing programmes for Apple II*, Vic 20** and Commodore 64**. And there are Atarisoft™ arcade hits on the way for Texas Instruments TI 99/4A+ and the IBM PC#. Just look for these smash hits – Centipede™, Pac-Man[1], Donkey Kong[2], Stargate[3], Defender[4], Robotron[5], Dig Dug[6], and other Atari arcade hits in the colour coded pack for your computer.

ATARISOFT™

See the new Atarisoft™ arcade hits for your favourite computer at leading computer software stockists now.

Futuretronics

Atarisoft is distributed by Futuretronics Australia Pty. Ltd., 1076 Centre Road, South Oakleigh 3167.

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CONCORD/8665

New Sirius, Victor Releases

BARSON HAS announced new releases to support the Sirius systems range.

Vicki is a 16-bit transportable computer compatible with the Sirius 1 range. With an 8086 CPU, twin disk drives, 2.4 MByte storage, 256K of internal memory and an in-built 9" (23 cm) screen, Vicki offers power and portability. It is designed as an addition to the Victor 9000, not a replacement. No Australian price has yet been set, but Vicki markets for about $A6000 in Germany.

The Victor Plus PC allows the Victor 9000 series to read IBM-PC and IBM PC-XT diskettes and run PC and XT software; diskettes can also be reformatted to the Victor high-density formats.

The high-resolution graphics offered can display twice the PC's resolution, and the screen-updating technique of Victor systems allows screen-intensive application software for the PC to run faster. The Victor 9000 can select up to 2000 individual characters, as opposed to the PC's 256. It can display colour information in monochrome shades and colour text in alternative character fonts, reproducible on a compatible printer. The Victor Plus PC has a recommended price of $995.

A colour option is available for the Victor 9000. When this is used in conjunction with the Victor Plus PC and a colour video display, the Victor 9000 can run IBM-PC colour application software without modification. This unit has a list price of $295.

Victor has also released the 3276 SNA/SLDC and 3278 COAX Emulation Packages. The 3276 SNA/SLDC enables the Victor 9000 to communicate with equipment supporting the IBM 3276 integrated control unit/display stations. The Victor 3278 COAX allows the Victor 9000 to communicate with 3278 terminals. The 3276 SNA/SLDC has a recommended price of $695 while the 3278 COAX with option card and software is priced at $1195.

'VictorLAN' Local Area Network File Server and NetWorkstation are two new products to support networking. VictorLAN enables all users of the system to access common data files and expensive peripherals such as laser printers and mass storage systems.

The VictorLAN NetWorkstation is based on the Victor 9000 computers. It has 256 Kbytes of RAM and the same high-resolution CRT display and keyboard as the Victor 9000. There are three built-in communication ports, one parallel and two serial.

A maximum of 10 fileservers and 54 workstations can be installed in one network using VictorLAN connector modules. Ten file servers provide 100 Mbytes of hard disk storage. VictorLAN's operating system, based on MS-DOS, can accommodate up to 200 users, assigned access to the network according to security limitations and job needs. Users can access up to 15 disk file volumes from any workstation within the network.

All options for the Victor 9000 are available to VictorLAN NetWorkstations or converted Victor 9000 workstations. Available options include additional RAM and a voice input system. Victor can supply daisywheel and dot matrix printers that can be attached to VictorLAN workstations, and communication with mainframe computers by VictorLAN workstations is possible with Victor's Communications Emulator Software Packages. Initial deliveries of VictorLAN were scheduled for the end of 1983.

For more information on Sirius and Victor products, contact Barson Computers, 335 Johnston St, Abbotsford 3067. (03) 419-3033. ❑

Do you sit at home wondering if there's anyone else like you? Do you go off into a small room and do it alone? Did you know there are lots of people doing it with each other? Now you can join them!

With the Your Computer Club File you can find out who else has a computer like yours, or who can give you the good oil on a computer you would like to buy.

This list was as complete as we could make it when we went to press, but if your club isn't on it, write in and let us know the details. We'll publish an updated list in a few months time, so make sure you're in that one — if people don't know you're out there they can't join you!

A.C.T.

ACT Micro 80 Users Group, Bill Cushing, 10 Urambi Village, Kambah, 2902, 062 313630.

ACT Vic 20 Users Association, Chris Groenhout, 25 Kerferd St, Watson, 2602, 062 41 2316, Meetings 1st Monday each month at Boy's Grammar Scout Hall, Red Hill, 7.30 onwards.

ACTARI, Chris McEwan, Co-Ordinator, ACTARI, P.O. Box E112, Canberra, 2600, 062 88 7861.

Apple User Group (ACT), Jeff Brock, 1 Buckley Circuit, KAMBAH, 2902, 062 313630.

Australian ZX80 Users Group(AZUG), David Brudenall, 19 Godfrey Street, Campbell, 2601, for ZX80/Microace owners.

Canberra ACT Sirius User Group, Jim Bland, 062 81 2824, 062 81 2832.

Canberra Compucolor Club (CCC), Meets 7.30 on first Sunday of every month at the offices of Digital Equipment, 28 Lonsdale Street, Braddon ACT.

Canberra Microbee Users Group, Hugh Gibson, Microbee Store, Level 1, Cooleman Court, Weston, 2611, 062 88 6384.

Canberra Microbee Users Group, Adrian Van Wierst, 9 McGowan Street, Dickson, 062 49 7030.

Micsig, Registrar, P.O. Box 446, Canberra, 2601.

Omega, Geoff Cohen, 72 Spofforth Street, Holt, 2651.

N.S.W.

Albury-Wodonga Dist Mbee U.G., Eric Eulenstein, 202 Kooba St, Albury, 2640, 060 25 1601.

Apple Users Group, Colin Rutherford, P.O. Box 505, Bankstown, 2200, 02 520 0926.

Atari Computer Enthusiasts, Gary Francis, 78 Ayres Road, St. Ives, 2075, 2 0933 ext 354, or 789 1379.

Ausbug, Stephen Ford, P.O. Box 62, Londonderry, 2753.

Australasia ZX80 Users Group, Tony Mowbray, 87 Murphys Ave, Kieraville, 2500, 042 28 5296, for ZX80/81 Microace owners.

Australasian ZX80 Users Newsletter, 87 Murphys Ave, Kieraville, 2500.

Blue Mountains Microbee Computer Club, Roger Cooper, 047 58 7238.

Blue Mountains Computer Club, Eric Linsay or T. Macindoe, C/- P.O. Faulconbridge, 2776.

Central Coast Computer Club, Ron Thornton, P.O. Box 36, Ettalong Beach, 2257, 043 28 2862, 1st and 3rd Tuesday every month at Applied Technology, West Gosford, for all types of computer.

Commodore Users Group, John Guidice, G.P.O Box 4721, Sydney, 2001.

Compucolor Users Group, David Brown, 91 Regent Street, Chippendale, 2008.

Cumberland Computer User Group, S. O'Neil, 02 682 3851.

80-AT, The Australian 8080-Z80 Users, P.O.Box 165, Lakemba, 2195.

A.P.F. Users Group, Norm McMahon, 288 Kissing Point Road, TURRAMURRA, 2074, 02 44 2645.

Hawkesbury MicroBee Computer Club, Bruce Rennie, 045 67 7329.

Hunter U. G.- All Microcomputers, Secretary, P.O. Box 39, BROADMEADOW MNSW, 2298, Meets on the second Wednesday of each month in Room 308, building W, University of Newcastle at 7.45pm. Membership is primarily Apple II orientated, but anyone with interest in micros welcome.

Illawarra Microbee Computer Club, Ronald Read, 49 Beatus Street, Unanderra, 2526.

Illawarra Super 80 Users Group, Jim O'Grady, Chairman, P.O. Box 1775, Wollongong, 2500.

Kaypro Users Group, Stephen Foley, 03 857 7236.

MEGS (Microcomputer Enthus. Group), John Whitlock, P.O. Box 3, St Leonards, 2065.

Macarthur Computer Association, R.G. Freind, 109 Campbellfield Ave., Cambelltown, 2560, 046 25 2752.

Mi Computer Club, Norma Jackson, P.O Box 21, Waterloo, 2017, 02 662 8888.

Newcastle Microcomputer Club, Mr. Gordon Johnson, Electron Microscope unit, University of Newcastle, 049 685045.

N.S.W. 6800 Users Group, 27 Georgina Ave., Keiraville, 2500.

Northern Beaches Vic User Group, E. Tuxford, 161 Barrenjoey Rd., Newport, 2106, Ph 997 2467, Community Centre (If We're lucky).

Northern N.S.W MICC Chapter, Alen Hartley, Dundurrabin via Dorrigo, 2433, 066 57 8160.

Northside Microbee Computer Club, Tony Williams, 6 Tunks Street, WAVERTON, 2060, 267 7747 bh, Meets on third Saturday of each month from 1-5pm at McMahons Point Community Centre. This is at the junction of Lavender St and Blues Point Rd, just short walk from Nth Sydney station.

N.S.W Peach User Club, Daniel Soussi, 02 698 8286, weekly meetings on Saturday from 2pm at 'Cybernetics Research' 120-122 Lawson St Redfern.

Pocket Computer Users Club, George Antonijevic, 02 683 4296, for those interested in pocket computers, whatever the brand. Meetings held on the first Wednesday of each month at 7.30pm at the 'Woodstock' Community Centre, Church St. Burwood.

Sorcerer Users Group, Mr. Ian King, P.O. Box 62, St James, 2001.

Sutherland Super 80 Group, Jim Traeger, 02 525 2018, Super 80.

Sydney Forth Group, Peter Tregeagle, 10 Binda Road, Yowie Bay, 2228, 02 524 7490, Forth Computer Language.

Sydney MicroBee Users Club, Tony Wilson, 02 909 3957.

Sydney Peach User Group, Ben Sharif, 261 Northumberland Street, Liverpool, 2170, 02 601 8493.

T.I. Sydney Home Computer U.G., P.O. Box 149, Pennant Hills, 2120.

VIC

Apple Users Society of Melbourne, G. Halprin, 03 859 5835.

AT Microcomputer Club, Grant Forest, 03 8792257ah, 03 699 2888 bh. This club has been formed for people interested in the Applied Technology DGOS Z80.

Atari User Groups Melbourne, Kelvin Eldridge, P.O. Box 173, 3073.

Australian Forth Interest Group, Tony Latermore, P.O. Box 704, SALE, 3850, 051 44 2011.

Australian North Star Users Assoc., P.O. Box 194, WANGARATTA, 3677.

Ballarat Computer Users Group, Publicity Officer: John Preston, 053 31 4363.

BUG 80 (Burwood Users Group), P.O. Box 46, BLACKBURN SOUTH, 3130.

Chip 8, 6800, 1802 User Group, Frank Rees, 27 King Street, BOORT, 3537.

Compucolor Users Group, L Ferguson, 12 Morphett Avenue, ASCOT, 3342.

Forth Interest Group, Lance Collins, P.O. Box 103, CAMBERWELL, 3124, 03 29 2600, Meets on the first Friday of the month.

Geelong Computer Club, Peter McKeon, P.O. Box 93, GEELONG, 3220.

IBM & Columbia Computer Users Club, Giles Bray, 22/11 Auburn Grove, Hawthorn East, 3123, 82 7632, 2nd Tuesday each month, 7.30 at the Victorian College of Pharmacy.

KAOS (Ohio Scientific), David Anear, 49 Millewa Crescent, DALLAS, 3047.

Latrobe Valley Colour Computer U.G., George Francis, 31 Donald Street, Morwell, 3840, 22 1389, for TRS-80 & MC10 users.

Melbourne Atari Computer En-

thusiast, Group is an Atari 400/800 personal computer user group for Australians and New Zealanders. Meetings held on first Sunday of each month at 12pm at 3M Australia Cnr. Blackburn & Ferntree Gully Rd., Melbourne.

Melbourne MicroBee Users Group, 03 741 5534.

Melbourne Super 80 Users Group, Hon. Sec. Victor Shuttleworth, 03 723 2713.

MICOM, Microcomputer Club of Melb., P.O. Box 60, CANTERBURY, 3126.

National Sinclair User Group, P.O. Box 148, GLEN WAVERLEY, 3150.

National ZX80 Users Club, 24 Peel Street, COLLINGWOOD, 3066.

Northn/Westn Sub. Comp. Users Group, John King (Secretary), 284 Union Road, MOONEE PONDS, 3039, 03 338 9304, Contact CP/M Data Systems.

Ohio Superboard Club, 27 McGown Road, MT ELIZA, 3930.

Peninsula Computer Club, George Thompson, 3 Patterson Street, Bonbeach, 3196, 772 2674, 2nd Tuesday each month at Chisholm College, Frankston, many types of computers are catered for.

SMUG, SCORD M100 Users, Robin Miller, 60 Winmalee Drive, GLEN WAVERLEY, 3150.

Sorcerer Computer Users (Australia), Secretary, GPO Box 2402, Melbourne 3001.

The Motorola User Group Soc. (MUGS), Clive Allan, 11 Haros Avenue, NUNAWADING, 3131, 03 878 1298, Group is interested in 6800/02/09 based computers, particularly if running Flex although this is not a prerequisite to join.

Vic. Assoc. of Computer Educators, Arthur Totrall, P.O. Box 69, WHITTLESEA, 3757.

Victorian VZ200 User Group, Luigi Chiodo, 24 Don St., Reservoir, 3073, 03 460 3770.

ZX81 Software Exchange, C/-Chips Taens, 5 Muir Street, MT. WAVERLEY, 3149.

QLD

Apple-Q the Brisbane User Group, The Secretary, P.O. Box 721, SOUTH BRISBANE, 4101, Has User Group days every third Sunday of month at Hooper Education Centre, Kuran St. Wavell Heights. Centre is open from 8.30am till 4.30pm, members encouraged to bring Apple along.

Australian Sirius Users Group, P.O. Box 204, CHERMSIDE, 4032, 07 350 2611, Looks after the needs of Sirius One and Victor 9000 computer users. For membership form write to above address.

Brisbane Super 80 Users Group, Gary Gatfield, 08 355 3173. CBM/VIC Users Group Of N.T., Ian Diss, 089 27 9208.

Brisbane Youth Computer Group, A. Harrison, P.O. Box 396, Sunnybank, 4109.

CBM/VIC Users Group of N.T., Ian Diss, 089 27 9208.

Commodore Computer Users Group QLD, Mrs D D Dillan, P.O. Box 127, STONES CORNER, 4120.

Commodore Users Group, John Egan, P.O. Box 274, SPRINGWOOD, 4127, 07 287 2705, Is for owners of Pet/CBM and Vic-20 machines. Meetings held on the first Tuesday of the month at 130 Petrie Terrace, Brisbane.

Computer Owner's Group, Betty Adcock, 42 Lucan Ave, Aspley, 4034, 263 4268, 2nd Wednesday each month, 7.45 pm, all kinds of computer are catered for.

Gold Coast Microbee User Group, Col McLaren, 1-100 Imperial Parade, Labrador, 4215, 075 314610, meetings first Sunday each month, 3.00 at the Southport High School.

IREE Microcomputer Interest Group, N Wilson, P.O. Box 811, ALBION, 4010.

Mackay Microbee User Group, Geoff Gehring, Box 230, Mackay, 4740, 079 42 3214.

Superboard Users Group, Ed Richardson, 146 York Street, NUNDAH, 4012.

The Microcomputer Society, The Secretary, P.O. Box 580, FORTITUDE VALLEY, 4006, Meetings are held on the second Friday of each month in the Old Town Hall, corner Vulture and Graham Streets, Sth Brisbane. Meetings start at 7.30pm if main gate is closed use the back stairway.

Townsville MicroBee User Group TMUG, Chris Hayes, 077 796065ah, Meets at 7pm on the second Monday of the month. Another 'user' meeting is held later in the month. Meetings are held at Town and Country Computers, CTL Centre, Anne St. Aitkenvale QLD.

TRS80/System 80 Interest Group QLD, 396 2998, Meets on the first Sunday of each month at 21 Rodney St, Lindum, at 2 pm.

ZX 81 Club, P. Carswell, 22 Braud Street, BUNDABERG, 4670.

S.A.

Adelaide Atari Computer Club, Shirley Cornish, 11 Sweetwater Street, Secombe Gardens, 5047, 08 296 6553, 1st Monday each Month at 6 Mosely Street, Glenelg.

Adelaide Micro User Group, R. G. Stevenson, 36 Sturt Street, Adelaide, 5000, for TRS-80 and System 80 Users.

Beebnet, P.O. Box 262, KINGSWOOD, 5062, The group intends to produce a newsletter on a monthly basis. It is interested in any software producers or distributors who would be interested in serving the groups market requirements.

Commodore/Vic Computer Users Assoc., Mr Eddie Hann, 13 Miranda Road, PARALOWIE, 5108, The SA branch meets monthly.

Compucolor-Intecolor User of S.A., P.O. Box 86, Torrensville, 5031, 08 352 3296.

Darwin Microbee Users Group DBUG, Felino Molina, P.O. Box 3111, DARWIN, 5794, 089 82 5613bh, 089 88 1455ah.

Kaypro User Group, Myles Wakeham, 100 Pirie Street, Adelaide, 5000, 08 223 6333, meetings 1st Tuesday each month.

Microbee Users Club of S.A. MUCSA, Ross Savas, 26 Denman Terrace, Lower Mitchum, 08 277 7697.

N.T. 80 Computer User Group, R T O'Brien, 433 McMillans Road, Jingili, Darwin, 5792.

S.A. Commodore Computers U.G., Eddie Hann, The Secretary, P.O. Box 427, North Adelaide, 5006, 258 6367, meetings second Tuesday each month, 7.30 at Royal Caledonian Hall, 379 King William St, Adelaide.

S.A. Hitachi User Group, Cliff Hignett, 45a Ormond Ave, Daw Park, 5041, 08 274 9341.

S.A. Microprocessor Group Inc SAMG, The Secretary, P.O. Box 113, Plymton, 5038, 08 278 7288.

Sorcerer Users Group of S.A., Jeremy Webber, 22 Delange Avenue, BANKSIA PARK, 5019.

South Australian Apple Users Club, The Secretary, SAAUC, C/-The Bookshelf, 169 Pirie Street, Adelaide, 5000.

The Microcomputer Assoc. of the N.T, Andy Smith, Darwin Community College, CASUARINA, 5792.

W.A.

CU WEST WA Compucolor/Intecolor U.G., John Newman, 8 Hillcrest Drive, Darlington, 6070.

OSWEST-Osborne Users Group of W.A., 09 330 3439.

Perth 80 Users Group, C Powell, 09 457 6849, for System 80 and TRS 80 Users.

Perth Hitachi Peach Club, The Secretary, 1 Charf Court, Riverton, 6155, 09 367 5880, for Hitachi Peach & 6809s.

Sorcerer Computer Users of Aust., The Secretary, 90 King George Street, PERTH SOUTH, 6151, 09 367 6351.

Super 80 Users Group Perth, Garry Black, 19 Bendigo Way, CITY BEACH, 6015, 09 385 8813.

The W. A. Atari Computer Club, Mr Alf Gaebier (Secretary), P.O. Box 7169, Cloisters Square, PERTH, 6000.

W.A. Microbee Club, Mike Oborn, 09 447 5366.

Vic-Ups, G. Padfield, 09 451 4629.

W.A. ZX Users Group, Phil Taylor, 09 328 4111, (bh).

WA University Computer Club, 2nd Floor, University of WA, Guild Building, 09 386 1455.

TAS

Devonport Computer Interest Group, John Steveson, R.S.D 422, SHEFFIELD TASMANIA, 7306, 004 92 3237.

Spectravideo Computer Users Group, Mr W. P. Decket, 48 Heather Street, LAUNCESTON, 7250, 44 4836, Membership to the club costs $15 which entitles memebers to a newsleter and to discounts in computer equipment. Monthly meetings of the club are held.

TAS-Micro, Peter Deckert, Unit 1/456 West Tamar Road, RIVERSIDE, LAUNCESTON, 7250.

Tasmanian Commodore Users Assoc., Vincent T. Staggard, The Secretary, G.P.O. Box 391D, Hobart, 7000, 002 72 0295, Commodore and others

Tasmanian OSI User Group, David Tasker, 111 Bass Highway, Westbury, 7303.

N.Z.

1802 Users Group, P.O. Box 6210, AUCKLAND, NEW ZEALAND, For those who own an ETI-660 or a COSMAC VIP, you can contact the 1802 Users Group. Be kind and send them a return addressed envelope and some International Reply Coupon.

Nelson Vic Users Group, Peter Archer, Nelson VIC Users Group, C/o P.O. Box 860, Nelson N.Z., for Vic and Commodore.

Wellington Microcomputer Soc. Inc, Lindsay Williams, 2 Pope Street, PIMMERTON, NEW ZEALAND.

ZX81 Club, R Skelton, C/- Harbourside Orchard, WAIUKU NEW ZEALAND.

COMDEX™/Fall '83—

Your Computer *managing editor Matt Whelan spent 'COMDEX Week' in Las Vegas to bring you this report on the world's biggest computer trade show, COMDEX/Fall '83. It ended on December 2 yet, he says, he's still discovering new products and packages released there.*

COMDEX is a codename – it represents a new form of torture designed specifically for those in the computer industry. And it's so subtle, people subject themselves to it willingly, in many cases even paying for the 'privilege'.

First, they accept being sentenced to five days in Las Vegas – the place with so many flashing lights that, if they ever synchronised, the rest of the United States would black out; the place that breeds hotels the size of a football field, with the lobby at one end, the lifts to the rooms at the other, and obstacle courses made up of gaming tables and poker machines in between.

Then they discover the 'hard labour' portion of the sentence: trying to see all the exhibits in the five days allowed. It's only the fact that shuttle buses run between the various sites needed to house the mammoth display that helps restrict their week's walk to a mere 14 kilometres of aisles...

Sometimes they decide it's been worth it when they stumble upon 'the perfect product', just what they came looking for! That's the cue for the ultimate torture – the man in the booth quotes a delivery date of August 1984 as he unashamedly asks them to sign a pro-forma 'Letter Of Intent'.

Pain, Or Pleasure?

Both. There are a lot of good things to be said for assembling the US computer industry in one town, especially if you're visiting from overseas and want a concentrated technology diet.

I may have over-emphasised the dark side of COMDEX (however, I *do* have a copy of a letter of intent to purchase a machine slated for August release); I have probably done so to justify the incompleteness of this report.

In an exhibition this big – there were 1400 exhibitors spread over five main sites – you could pick any 10 delegates and get from them at least five quite different views of the show. This report is the view of just one of the 80,000 COMDEX attendees.

The most obvious 'theme' for a visitor used to a wide open market like Australia's was the dominance of the IBM PC. It seemed that almost every new product was IBM-related – if it was hardware it was a PC copy or peripheral, if it was software it was written for PC-DOS first, and other operating systems second (if at all).

Major manufacturers, some dominant in the micro market before IBM even thought about entering it, are releasing compatibles too. Texas Instruments, NorthStar, Televideo, Sanyo and Panasonic were just a few of the new IBM imitators.

IBM itself was a star exhibitor, with the new PCjunior – although its appearance at the show wasn't nearly as interesting as some of the rumours surrounding it. Various industry observers had it that IBM was full of internal grimaces at the too-early release (forced by press speculation) of an incomplete machine; or, more interestingly, that the announcement was a dastardly scheme to ruin everyone else's Christmas sales figures. Those stating the latter opinion said IBM was planning to withdraw the machine from the market in January, before any shipments were made!

Join The Queue

Rumours notwithstanding, there is a long queue forming for the PCjunior (how I hate that name...), even though dealer demo units were only shipped in early December, and customer deliveries won't start until 'first quarter, 1984'.

While you may not be able to buy a machine, you can read about it (I saw the first issue of PCjr magazine at the show!) or start shopping for software for it (Pyramid Data, for example, used the show to announce four packages for the baby IBM).

IBM's display was probably the biggest, and most professional, at the show. It held pride of place in 'The Gold Room', actually a suite of rather large rooms right at the front door of the Las Vegas Convention Centre.

I hear the IBM show staff underwent special training prior to COMDEX, and I can believe it. Each separate display was manned by people who actually knew what was going on in their little corner of the world, and they all knew who to send you to next if you asked a question outside their brief.

Visitors queued for up to an hour to take part in a special hands-on demonstration of the junior, complete with tutorials, audio-visuals, and surprise special-effects. There were also several units in the normal display areas, although the range of software being run seemed limited.

I'm sure, after my very brief look at the junior, that one of the earliest hardware releases for it will be a replacement keyboard. The cordless (infra-red) 'connection' to the processor unit must be an attempt to draw attention away from the fact it has one of those awful 'chiclet' keyboards. The keytops aren't even marked with their respective characters – that's all on the case itself.

Whether I like the look of it or not, you can be sure the junior, like 'daddy', will create an industry of its own (as long as IBM quashes those rumours and actually gets the machine on sale).

Tandy's Big Surprise

Tandy caught most people napping with a mid-show release that provided several surprises in the one package, its new Model 2000.

What was so special about it? First, it *isn't* an IBM workalike, even though it is a 16-bit MS-DOS machine. Tandy has opted for performance, rather than the mediocrity of cloning. It has a true 16-bit data path, and runs an 8MHz Intel 80136 processor.

Tandy claims the Model 2000 is three times faster than the IBM in benchmark comparisons, has four times the disk storage, twice the graphics resolution, and more expansion capability.

Second, it's a Tandy that isn't locked into Tandy-supported software, thanks to its 'industry-standard' MS-DOS operating system.

The company is quick to point out you can have 'the hottest programs on today's market' – starting with dBase II, Multiplan, PFS:File, and a whole lot more soon to come including Microsoft Windows.

Similarly specified, the high-performance Tandy is cheaper than the IBM and most of its imitators. A two-drive (720 kilobytes each), 128 kilobyte machine with serial and parallel ports included sells for $US2999, while a 10-megabyte hard-disk version with 256 kilobytes internal memory sells for $US4499.

On The IBMwagon . . .

I could spend the next three pages listing the new compatibles, the updated compatibles, the cheaper compatibles, the better compatibles or the compatible compatibles. I won't.

-Mammoth Computer Exhibition

Instead I'll pretend many of the lesser lights in this circus of clones have already had their liquidation, and note just a few of the significant ones...

I do wonder whether IBM designed a portable and just forgot to build it, because everyone is copying it regardless. Most manufacturers in this corner of the market have a Clone-PC, a Clone-XT, and a Carry-Clone – and those who don't have one of each often start with the portable.

Televideo is one manufacturer which used COMDEX to announce its 'get with the strength' policy: it released "an advanced 16-bit personal computer (the TS 1605) which is fully hardware and software compatible with the IBM PC" plus "a hard-disk personal computer and a 16-bit portable, both of which are hardware and software compatible with the IBM Personal Computer and the recently announced Televideo TS 1605".

Texas Instruments announced colour and mono portables that are compatible with the almost-clone TI Professional. One of the impressive things about the Professional is TI's software support effort, and all these packages go straight onto the list for the portables as well.

The Professional now has a 10-megabyte hard-disk option, and this will be carried over to the portables too.

There were a lot more entries in the workalike stakes. Old hand NorthStar showed a fresh approach with 'multiclone' – a multi-user system where each station behaves like an IBM PC, but shares resources such as disk-drives and printers. It's supposedly software-compatible, but obviously not so in its hardware. Others on show included Columbia, Stearns, Seequa, Corona, Compaq and more...

Other Portables, And Other Things...

I'll never get to tell you about half of what I saw, and I only really absorbed half of the COMDEX mammoth...but here are a few of the things which caught my eye:

There was a lot of action in the portable/transportable field, with a new 16-line display for the Gavilan, three similar flip-top machines all released with the same name (Commuter), a neat Osborne-style portable Micro-Decision from Morrow, and a 16-bit upgrade for the Kaypro II and IV (available for retrofit to earlier models, too).

Kaypro also announced a desktop machine, the Robie, which squeezes 2.6 megabytes onto each of its floppy ▶

Top — Tandy 2000; centre — Morrow's transportable Micro-Decision; bottom — HP150 with touch-screen.

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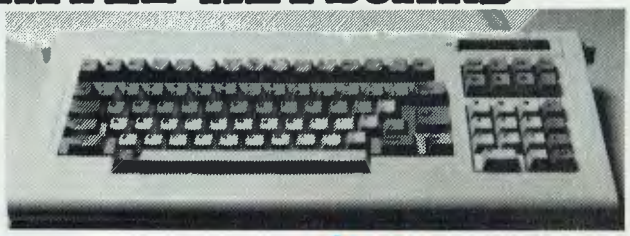

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drives, has inbuilt modem and clock, and will retail for around $US2295. The prototype is not the most attractive machine in town...

Osborne had a stand at Comdex. It was vacant, except for a small sign left by the organisers to say who the space had been reserved for.

Worth mentioning if only because we reviewed its baby brother in the December issue is the "Sweet-P Six-Shooter", a fully automatic, six-pen version of the Sweet-P plotter which will sell for $US1095.

Australia had a relatively strong contingent at the show, although it was a little off the beaten track at one of the outlying sites (the Sahara Hotel). Nevertheless, in the Press Lounge I heard US magazine journalists discussing an 'impressive portable' – the Dulmont Magnum – and interest in the 11 Australian booths was high.

We were represented by Abraxas Computers of Adelaide (Commodore software), Amust (Melbourne, briefcase machine), Datamax (Sydney, Datamax 8000), Dulmont (Sydney, the Magnum), Eracom (Queensland, Line Encryptor), Flexible Systems (Hobart, robots), Integrity Management Services (Melbourne, business software), Labtam (Melbourne, Labtam 3000), Netcomm (Sydney, comms interfaces), Ran Data (Perth, data security products), and Sybiz Software (Adelaide, 'Big 8' accounting system).

Networking received its fair share of attention, ranging from machine-specific (for example, Kaypro's Kaynet) to wide-open systems using intelligent data-switching boxes to connect widely differing hardware.

Of most interest, to me at least, was Digital Research's announcement of Soft/Net. Claimed to solve the problem of protocol incompatibility in Local Area Networking, it supports file sharing with record and file locking, password protection, resource sharing, electronic mail and print spooling.

It will be available across the CP/M family of 8- and 16-bit operating systems.

Digital Research, like Microsoft and Visicorp, also showed its windows product – a version of Concurrent CP/M which can overlap all four running applications on the screen at once. Updates announced for the next version of Concurrent CP/M were interesting, too – the ability to run MS-DOS programs will be particularly useful.

DRI moved further into the graphics field, too, with the release of DR Draw, DR Access 10, and a PC-DOS version of DR Graph.

'Fourth-generation' languages with powerful database management facili-

ties and, in some cases, artificial intelligence add-ons or applications program generators started to appear in force, although most of them seemed 'not quite finished'.

Touch screens (Hewlett-Packard HP150 and MicroTouch Systems Inc) were impressive, even if research has shown that pointing at a VDU is tiring on the arms. The alternatives – the Mouse, voice input (Texas Instruments), and highly developed electronic writing pad systems were all well-displayed.

Pioneers Still Advancing

Amidst all the hype and wonder of IBM compatibility, pioneers like Altos, Onyx, Morrow Designs and Compupro are still doing their own thing – and coming up with some exciting new machines because of it.

Compupro released its MP-10, a four-user machine with four Z80s, an 8088, and a megabyte of internal memory. It sells for just $US4995 in basic form, or $US8490 with a 40-megabyte hard disk.

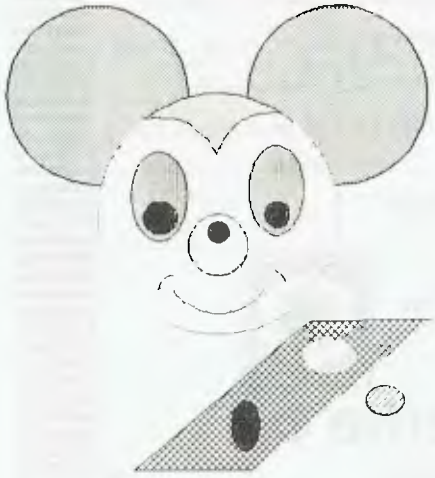
Morrow Designs showed some fascinating new machines on its stand. It had hard-disk and 16-bit versions of the popular Micro-Decision, the transportable mentioned earlier, and a low-cost networking system (the 'tower' display on our cover).

If George Morrow was more like some of the other exhibitors, his stand could have been the centre of attention at the show. However, it was only those who attended his after-hours cocktail party who got to see the prototype of a battery-powered portable he'll release next year.

The tiny Morrow stands on its end, and a 'proper' keyboard folds down onto the desk for use. It doesn't rely on internal memory for storage, either – in the right side of the machine there is a micro-floppy drive (though there's room for a 13 cm minifloppy if he decides to go that way). The LCD display is 80 characters by 16 lines, with room for a 24-line display when they become available.

It sports a 16-bit processor, and runs the MS-DOS operating system. Battery life is said to be six hours. ❑

On the opposite page, from top to bottom, are the TI portable computer — being operated by voice input — the Compupro MP-10, and the IBM PCjunior. On this page are, right, the Sweet-P Model 600 six-colour plotter, and, below right, the Televideo TS1605 IBM PC-compatible computer.



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Sometimes the best advice can be the worst kind, particularly when it's the basis of a major business decision, like the purchase of a new computer system. Talking to one company, one man or one user may fill you with information that can have its short-comings. To get all the info, all the best unbiased advice you should seek out someone who knows all the systems.

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Harry Henderson can tell you everything there is to know about micro-computers. He sells every one he buys. As Manager of the Myer Computer and Business Centres, Harry buys millions of dollars worth of all kinds each year.

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The three most common mistakes you can make when choosing a microcomputer.

The first one is fundamental, but it is ignored by most people who buy a name and not a range of functions. There are, in fact, very few bad computers around but that doesn't mean that all computers are born equal. Choose one that best suits your needs.

Next, take the trouble to check speed and functions. Few people do. They simply take it for granted that all microcomputers are the same in performance. For instance, the most important aspect of your computer is the size of its memory. The bigger the memory and the memory potential, the longer it will last. The faster it works the more work gets done.

Thirdly, the real name of the computer game is Software. That is, the programmes you can buy off the shelf to run in your microcomputer. It is surprising how many hard nosed accountants buy a microcomputer for one or two functions when, with the right Software, it can perform half a dozen or more important office tasks.

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Meet The Hyperion™

Having spent a freezing winter in Canada a few years ago, Les Bell has a soft spot for things Canadian. He was particularly pleased, therefore, to review a new Canuck IBM-compatible portable, the Bytec Hyperion Plus.

OTTAWA, THE CAPITAL city of Canada, is rather reminiscent of Canberra. It is not one of the major commercial cities; Toronto and Quebec occupy that position and are similar to Sydney and Melbourne respectively – except, of course, Melbournians don't speak French, nor are they as vocal about secession.

I only spent a short time in Ottawa during my tour of duty in Canada some years ago, and didn't really get to know the place. I do remember it was cold, and I remember staying at the Chateau Laurier, a marvellous old hotel with three-foot-thick walls. I don't remember Ottawa as 'Silicon Valley North'.

Yet that's how it is described by C. Murray Bell, chairman and founder of Dynalogic Info-Tech Corporation, manufacturer of the Hyperion personal computer. Actually Dynalogic has been swallowed by Bytec Corp in a corporate reshuffling (both are part of Canadian electronics conglomerate Mitel), and now the machine is the Bytec Hyperion.

Incidentally, I seem to recall that IBM, which has an agreement with Mitel on the latter's PABX technology, has bought into Mitel. If that's right, then IBM is part-owner of one of its competitors!

Hyperion, by the way, was one of the Titans of Greek mythology, and was the father of the sun, the moon and the dawn. I doubt, however, that the Hyperion computer will meet with a Titanic fate.

The big growth areas at present are IBM-compatible machines and transportables, and the Hyperion is both of those. It's probably more important to be IBM-compatible, but transportability brings with it the virtues of a compact package, and that's important for any machine that's supposed to fit on the edge of an executive's desk.

The Hyperion package is excellent from the mechanical point of view. It's stylish, slim and sleek, with excellent ergonomic features. For a start, it's compact: 464 mm wide by 288 mm deep and only 223 mm high. That's a low-profile design.

The slimline keyboard slides into a recess under the system box when not in use, freeing valuable desk space. Above the keyboard, the front of the box has a nine-inch amber screen at the extreme left, and towards the centre of the front panel there's the on/off button (where you can see it and reach it!) and the brightness and contrast controls (likewise). I hate leaning over the tops of machines and fiddling with invisible controls.

Finally, at the right of the fascia are two 13 cm disk drives. These Remex drives have heads which lock apart when no disk is inserted, to avoid damage during transport. The drives are recessed behind the fascia, so that the whole design is well integrated and clean.

The top of the machine incorporates a recessed carrying handle, which is also an ideal place to stuff the power cord when the machine is in its carrying case. This handle is ideal for carrying the machine around the office, although for longer trips the padded carrying case is more suitable.

At the rear are a number of connectors: the mains connector, RS-232C and Centronics parallel interfaces, plus a video output jack and a couple of US telephone connectors. In the US and Canada, the Hyperion can be connected between a telephone and the wall jack; ▶

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its internal modem circuitry can be used for data communications as well as for automatic dialling and other communications management functions.

The package is very neat and tidy indeed, and is particularly compact. Perhaps this is part of the appeal of the Hyperion as well as the Osborne, Kaypro and other portables: their compact well-integrated format makes a desk look tidier.

Standard Keyboard

The keyboard is a standard QWERTY type. While it leans towards the IBM organisation, it does not have the curious positioning of the return key and additional keys, sticking instead to the traditional Selectric layout. It has an additional comma key on the numeric pad to meet European requirements, and the softkeys (user-definable keys) are at the top of the keyboard in a row below the screen.

The keyboard has a light touch with a slightly springy feel, which I found slightly odd at first but then got used to. It's a slimline design with two pop-out legs which provide a degree of tilt, but which retract when the keyboard is pushed under the system enclosure.

The internals of the Hyperion are well-designed. The basic objective of the designers was a high degree of IBM compatibility, and this has been achieved. It is possible to boot the Hyperion with an IBM PC-DOS disk, though not all PC-DOS software will work.

However, Bytec produces a monthly list of software which has been tested on the Hyperion, and the latest version of this contains the vast majority of significant packages. The ones which won't run are those which directly address hardware locations, such as the Microsoft Flight Simulator, which directly polls the IBM-PC keyboard.

I've tried a number of different IBM-PC packages on the Hyperion, and they all worked pretty well unless they did some tricky manipulations of disk buffers or other fancy stuff. For example, the FriendlyWare PC Introductory Set managed to drive the sound generator correctly, but left the sound running rather than turning it off at the end of a sound effect.

The Hyperion has two graphics modes: 320 by 250 with a four-level grey scale, and 640 by 250 high-resolution mode. Both of these modes will operate with 200 lines vertical resolution for IBM-PC compatibility. Obviously, the Hyperion does not display colour, as it has an amber screen, but the grey scale display is quite effective.

The processor is an Intel 8088 running at 4.77 MHz, and there is a spare slot beside it for an 8087 processor chip. Also on the main circuit board, which sits vertically at the rear of the machine, is 256 Kbytes of RAM – enough for most applications short of large spreadsheets. In fact, the operating system allows spare memory to be allocated as a memory disk drive, typically of 120 Kbytes or so.

The serial and parallel ports are a superset of the IBM machine's, but remain compatible – even the pinouts on the connectors are identical. Also on the main board is a battery-backed-up real time clock chip, which supplies date, time and day of the week. The time is continuously displayed at the bottom of the screen, between the two sets of labels for the softkeys.

The disk drives are, of course, IBM double-sided format-compatible. They are quiet and power down when not in use; the only problem with them is that they seem to be rather choosy about the quality of disks used. At first I suspected the alignment on the B: drive of the review machine, but by the end of the review felt it was more likely to be the disks I was using or possibly the disk controller circuit.

Software

The software supplied with the Hyperion leaves little to be desired, covering virtually all the standard applications straightaway. Very few other software packages will be required.

The operating system is Hyperion DOS, aka MS-DOS with a difference: the memory layout of this version is the same as IBM's PC-DOS 1.1. It includes all the usual commands of MS-DOS, such as EDLIN, CHKDSK, DEBUG and others. However, Hyperion has extended it somewhat with the addition of some new commands and features.

The bottom row of the display is devoted to labels for the softkeys. Four lines of softkey labels and functions are available, and each keystroke can either insert text into the command line or shift to another softkey line, changing the functions of the keys.

The default settings of the softkeys are well thought out for the occasional user, giving instant access to the most common commands. Always present is a HELP key, which provides a concise explanation of the functions of the other keys.

One of the other keys, labelled XPLAIN, runs a program called EXPLAIN.COM, which accesses more detailed help files. Thus one can select XPLAIN FORMAT with two keystrokes (plus return) to get a screenful of assistance on the FORMAT command.

The program KEYEDIT.COM can be used to redefine the keys for other applications. Most of the applications available on the Hyperion have been customised to make extensive use of the definable keys.

The MODE program has been rewritten by Hyperion to make it easier to use and more versatile. The user can use MODE to set the screen attributes (40 or 80 column, IBM or Hyperion attribute interpretation, memory mapped as colour, mono or either, attribute translation, softkeys displayed at command line, and so on), the printer port, serial port attributes such as baud rate, and the size of the C: memory drive.

The system comes with the Microsoft Macro Assembler, though doubtless few end users will have a use for it.

The primary language for end users is BASICA, otherwise known as Microsoft's GW (Gee Whiz) BASIC. This is the fully featured BASIC that was first revealed to the world in the IBM-PC, but is the logical result of years of writing graphics and sound extensions to BASIC for Japanese companies, not to mention Radio Shack Color BASIC.

It features a wide range of graphics statements such as PSET and PRESET, LINE and DRAW, as well as music and sound statements, plus the ability to access the various ports, respond to softkey interrupts and other extensions that Kemeny and Kurtz never imagined in their wildest dreams.

Word Processing

Perhaps the major application for most users, however, is word processing. Here Bytec supplies its own program, called IN:SCRIBE. The idea is that executives using the Hyperion will not be heavy users of a WP program, and therefore it should be simple to use. To this end, IN:SCRIBE makes heavy use of the softkeys and the other suitably labelled keys on the keyboard.

IN:SCRIBE is an in-memory editor, which makes it particularly suitable for small quick jobs, or for use with a single disk drive version of the Hyperion. It seems to work quite well, and certainly is easy to use; by following the softkey prompts, I managed quite well without looking at the manual.

A typical problem with this kind of machine is that it could be used with any of a number of printers, each requiring different escape sequences to access print enhancements. Bytec gets around this by supplying print filters, which are placed onto the work diskette and patched in via the MODE command to translate escape sequences for the appropriate printer.

The other major application for this type of machine is spreadsheet analysis. Bytec has two major alternatives: MultiPlan and Lotus 1-2-3, both of which have been described previously in these ▶

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pages. MultiPlan is a particularly nice 'straight' spreadsheet, with strong facilities for consolidation and iterative problem solving.

Lotus 1-2-3 is the software hit of the year, a combined spreadsheet, graphics and database package with very advanced features and the ability to build very large models (with enough memory, of course).

This package is particularly nice on the Hyperion, as the softkeys are dedicated to otherwise tedious functions such as the graph viewing keystroke sequence.

Perhaps the most interesting of the Hyperion software packages is the Aladin relational database. This is a West German product, originally written for the UCSD p-system, but now more widely available.

This advanced database manager can handle up to 256 on-line files, each with up to a million records. It includes particularly advanced statistical and calculator modules, and the ability to work with external software packages such as word processors and spreadsheets. Unfortunately, Aladin arrived just as this article was being completed, so I can't provide a more comprehensive rundown.

Benchmarks

I performed a couple of benchmarks on the Hyperion to test the processor and disk speed. The standard 'Interface Age' prime number benchmark ran in 12 minutes 39 seconds, which is about the same as the IBM-PC. The 'Byte' benchmark, bm9, ran in 1919 seconds, which is slightly faster than the IBM (at 1950 s).

I ran my standard test of writing the word 'TEST' to disk 3000 times, and the Hyperion did it in 27.1 seconds, against 26.95 for the IBM. These results are not significantly different from the IBM, as one would expect from a compatible. Using the memory drive, the time was cut down to 15.6 s.

Documentation

The documentation for the Hyperion is excellent. While it is not up to the IBM standard, it is still very much better than we used to get even a year ago. All manuals are in cloth-covered slip cases similar to the IBM guides, with disks in vinyl pockets at the back.

The User Guide explains the basic principles of operation in a way almost anyone could follow, covering installation, disk formatting, DOS commands and other general topics. The Programmer Guide covers the BASIC interpreter and macro assembler (a bit intimidating for the first-timer).

Also supplied with the basic machine is the Aladin Guide. This is well organised, with separate tutorial and reference sections. Aladin is not a simple system, but after working through the tutorial section of this manual, the user should be able to cope with most applications.

Also supplied as part of the Hyperion Plus package is the IN:SCRIBE word processor package, and the manual for this is the smallest of those supplied, as befits a software package designed for ease of (occasional) use. Again, the organisation is partly tutorial and partly reference.

The MultiPlan Guide is an edited version of the standard Microsoft document, while the 1-2-3 Guide has been extensively reworked from the original version for the IBM-PC and Compaq.

All the manuals are attractively packaged and presented with the Hyperion name on the spine.

Support

The impression I receive of Bytec Management is that the company intends to stand firmly behind this product. It was among the first manufacturers to offer its own version of Lotus 1-2-3, it has packaged a wide range of alternative software and tested a lot more, and is continuing to support the machine with further enhancements.

I suspect the Hyperion will have a fairly long life, and so it will be supported heavily for a few years to come. The expansion tower will allow significant expansion capability and provide capacity for growth for the foreseeable future.

In addition, Mitel (Bytec's parent) is not exactly a small company. I suspect that with the exception of Northern Telecom, it is Canada's largest electronics company, and its backing will be an important factor in Bytec's success.

Overall Performance And Impressions

The Hyperion performed well in actual use. Firstly, because of its compact packaging, I was able to put it on the corner of my desk and leave it there for a few weeks of occasional use, without it totally dominating the office.

To use it, I simply pulled out the keyboard, flipped its legs out, and booted the system. The 7" (17.8 cm) screen is fine for everyday use, with well-formed characters and a good contrasty display. The amber is quite restful, though strangely I still find black and white best.

The only problem was an occasional refusal by the Hyperion to recognise that a disk was inserted in the drive, and while this could be a problem with the disk controller circuitry, I am more inclined to believe it was the diskettes.

All this persuades me that the Hyperion is a very worthy alternative to the IBM-PC as an executive workstation/personal computer. It seems to offer a high degree of compatibility, and there is no doubt that its styling and design are far superior to the PC, which totally dominates any desk.

Unless PC-DOS compatibility is absolutely required, the Hyperion is well worth a look. ❑

Specifications and Report Card

Unit:	Bytec Hyperion
Made by:	Bytec Corporation, Ottawa, Canada
Processor:	Intel 8088 or equivalent
Clock speed:	4.77 MHz
RAM:	256 Kbytes
ROM:	BIOS, bootstrap and diagnostic only
I/O:	One RS232C serial, one Centronics parallel
Languages:	All the MS-DOS tongues
Keyboard:	84 keys, soft QWERTY, numeric/cursor pad, 10 function keys
Display:	80 by 25 amber screen
Expansion:	Tower cardcase will allow hard disk and IBM-compatible boards
Best points:	Aesthetic appeal, portability, IBM-compatibility
Worst points:	Disk controller very marginal

Ratings:	Excellent	Very good	Good	Poor
Documentation:		•		
Ease of use:		•		
Functionality:	•			
Support:		•		
Value for money:	•			

Extras included:	Lotus 1-2-3
Options:	EX expansion unit
Price:	$5995 including sales tax for Hyperion Plus package; $850 inc. tax for 1-2-3
Review unit from:	Hyperion Computer Systems, 8th Floor, 275 Alfred St, North Sydney 2060. (02) 92-0729

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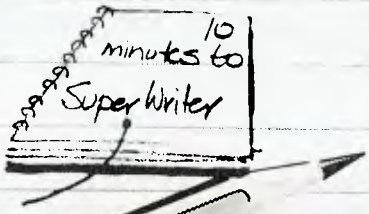

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MP/M II On The Creswick Data Systems CDS-2020

Many years ago, Les Bell got involved with installing MP/M 1.0 on an S-100 machine, and vowed never to get involved with MP/M again. However, good reports of MP/M II intrigued him, and he was particularly interested to know that it runs on the Creswick Data Systems CDS-2020.

WHILE THE GLAMOROUS END of the computer business is the personal computers with colour graphics and integrated software packages, like the IBM-PC and others, there's an awful lot of machines out there doing work that doesn't require all those ritzy features, but just solid performance.

For example, the average small business needs accounting, word processing, perhaps a spreadsheet for budgetting, maybe some production planning and control and perhaps some specialised applications. While colour graphics are nice, they are dispensable.

This kind of need can be satisfied by a machine with an external 'dumb' terminal, and given the physical and philosophical separation of the computer and the screen, it then makes sense to make one computer support several screens. After all, the expensive parts of the machine are the power supply and mechanical parts like disk drives and printer, plus the metalwork – adding more memory is cheap, and the processor generally has enough capacity to be shared anyway.

What I am describing is a multi-user system, rather akin to the minicomputers which are currently being replaced by micros. The key to such a system is having enough memory and a fast enough processor in the box, together with an operating system which can access all the memory and keep the users separate.

The CDS 2020 is such a system. Basically, it's a smallish box with a number of connectors on the back for four terminals and a Centronics-interfaced printer. Its small size belies the fact that it can allow up to four users to run CP/M programs independently and concurrently (at the same time).

Inside the computer, the circuitry is based on the STD bus. Originally proposed by Mostek and an industrial controller company called ProLog, the STD bus has been adopted by a large number of manufacturers and is a popular choice for manufacturers of industrial process control computers and equipment. A wide range of processor, memory and I/O cards are available for it, and it has just about the widest range of specialised I/O boards, such as analogue/digital and digital/analogue converters, current loop interfaces, relay drivers and other industrial boards.

The choice of the STD bus reflects the engineering orientation of the 2020's supplier, Creswick Data Systems. This is a division of Creswick Engineering, a supplier of packaging equipment for the food and pharmaceutical industries. Most of Creswick's sales are overseas, which is why you probably don't know them, but they are a fairly major company in that field.

As part of that manufacturing business, the MD of the company, Richard Creswick, decided that it would be a great benefit to have a shop-floor data acquisition system, to capture data about components being used as well as time information. This data could be used to calculate the assembly costs of each section of a machine, thereby giving greater control over costs and productivity.

He approached all the manufacturers of manufacturing systems, only to be told that no-one had such a system. So he decided to develop it himself. This involved designing an industrial-grade 'ruggedised' data logging terminal with a key reader, 16-key keyboard and an alphanumeric display. The Datamaster was the first product from Creswick Data Systems, and the first machines were put into use on the Creswick Engineering floor.

While the Datamaster can capture data, it still needs to be processed, and although a minicomputer could do the job, a micro can be just as effective and a lot cheaper. So Creswick decided to tackle the back end of the system as well.

The result is a range of microcomputers, of which the 2020 is the flagship. It starts with the CDS 5012, a single user system with 64K of memory and twin 800K 13 cm floppy disks. This can be expanded with a hard disk, more memory and I/O ports till eventually one arrives at the CDS 2020.

The system is not as big as I'd expected, at 450 by 184 by 425 mm, particularly bearing in mind that it is a bus-oriented multi-user machine. The front panel carries reset and halt switches and a power indicator, while the power switch is at the back. At the left side of the front panel is a 13 cm disk drive and a micro-Winchester disk drive with a capacity of 21.6 Mbytes.

Inside the box is a 12-slot card cage, of which seven slots were in use. The processor is a Z-80B, running at 4.9152 MHz, which is a tad faster than the average. There's also 256K of memory, which is adequate to support four users under MP/M II.

All in all, there's not much to describe about the hardware. It's well built, with a good solid feel, yet not over-engineered, if you know what I mean. The matt black front panel contrasts nicely with the imitation woodgrain cover, and the system seems quite attractive.

Software

The operating system on the 2020 is MP/M II. As mentioned above, I'd seen Version 1 of MP/M in operation, and it just about convinced me that multi-user operation on eight-bit micros was pushing one's luck a little. However, favourable experiences with MP/M-86 and good reports of MP/M-80 Version II made me think that maybe this new version could redeem the sins of the father, so to speak.

MP/M II requires bank-selected mem- ▶

Creswick Data Systems' CDS2020 multi-user computer.

ory with a 16K bank at the top end of memory which is permanently selected and is used for inter-bank communication. Actually, it doesn't strictly require it, but the system is pretty useless if it isn't configured that way. That top 16K is where the operating system resides, although part of it overflows into the bank-switched area.

MP/M (I or II) is able to load relocatable programs using a slightly more dynamic version of the same process as MOVCPM in standard CP/M. The first part of such a program is a bit map which defines which bytes need to be relocated, followed by the code as it would run at location 0. Once loaded, it is relocated and can run.

Such program files, known as .PRL (Page Re-Locatable) files, are comparatively few and far between. MP/M is supplied with .PRL versions of old favourites such as PIP and STAT, but most commercial software, like dBase and WordStar, is not available in this format. Of course, users of Digital Research's PL/I compiler or RMAC assembler and LINK linker can produce .PRL versions of their own programs.

However, if MP/M II is configured for bank-select operation, as this one is, it is able to load and run standard CP/M .COM files. Thus, the system gives multi-user operation while still being able to run the 'vast library of CP/M software' (to coin a phrase).

So the CDS 2020 is able to run most CP/M software with no alteration. Of course, programs which do direct output to the BIOS may produce unpredictable results, and programs like disk patchers will generally run into trouble. When using such programs, the system should be run under CP/M anyway, to minimise the risk of upsetting other users.

Like CP/M, MP/M splits disks into 16 user areas, and a user can log into any area to do his work. Creswick has chosen to split the hard disk of this system up, not by user number, but into separate logical disks. Thus, the hard disk was disks A: to M:, while the floppy was drive N:, with all files in user area 0. The reason for this is that the drives (except C: and D:) are each 798K in size, and can be backed up straight onto floppy disk.

C: and D: are just over six megabytes each, which makes backup a bit more awkward.

MP/M is a bit smarter than CP/M about the way it looks for files. CP/M only looks at the current disk and user area; MP/M looks at the current disk, current user, user 0, and drive A:, current user and user 0. Files on drive A: user 0 which have the SYS attribute set are available to everyone, and are termed public files.

The system had a range of software on the various drives, but it had obviously been used for development, as a lot of the files were protected by passwords – another feature of MP/M II. In addition, on some drives, many of the files were stamped with the date and time of creation and update.

I tried a couple of benchmark tests and found quite respectable performance from the 2020. It completed the Interface Age prime number benchmark in 11 minutes 32 seconds. I repeated the same test with two copies of MBASIC running the same program at the same time, and found that it slowed down by only a few seconds! This would seem to indicate that MP/M does not significantly degrade with additional users running processor-bound tasks – something I did not expect and am at a loss to explain (well, I have a few theories but no proof).

One of the most interesting software packages on the 2020 was dBase II. Now, you must surely be wondering what was so fascinating about dBase – surely I've seen it before? It's not so much dBase itself, but the commands which had been added to it.

Creswick Data Systems have an extension to dBase called dXCM, which adds a number of extra commands to dBase, to enhance operation under MP/M. Running an installation program produces a new program called dBASX.COM. The additional commands (which are even documented in the DBASEMSG.TXT file) support features like unlocking a file to allow other users access (MP/M defaults to unshared file mode), selecting a printer, sending or receiving messages to/from other programs and running other programs. For example, the command

MPM WS

runs WordStar from within dBase. dBase continues to execute at the same time, so the command can be part of a command file. Similarly, the command

DETACH

returns the user to the MP/M 0A> (or whatever) prompt, free to start another program running. Another useful command allows the user to store the system date to a dBase memory variable.

Expansion

The system can support another 144K of memory, enough to support seven users, and of course, it can handle the necessary serial ports. I still feel, though, that such a system will not support seven users all pounding dBase at the same time. Occasional enquiries, so that there may be, say, four users on at once would be OK, but seven number-crunchers or database users might slow the unit dramatically.

Documentation

The CDS 2020 is assembled for Creswick in Taiwan, and the manual that I saw betrays the fact with some Jinglish expressions. The information is all there,

though in a somewhat compressed format and not for the untutored beginner. Certainly the system administrator (as we call those unfortunate souls who are given computers to look after) should have some prior experience with CP/M.

Creswick also supplies the DRI MP/M manuals. Don't wait for the film; although DRI customarily write manuals that can only be understood at first reading by CompSci PhD's, you'd better at least try to wade through them.

Overall Assessment

I gave the CDS 2020 a fairly thorough workout during the time I had it. It plugged together and ran first time, took up a lot less space than my old S-100 box, and ran a lot faster, even with several users.

As I mentioned above, I was a bit pessimistic about MP/M originally, but the 2020 restored my faith in the ability of even puny eight-bit processors to do an amazing amount of work. The implementation of MP/M seemed robust and reliable, and gave no trouble during the review period.

The CDS 2020 will be of interest to those seeking a reliable multi-user system to run general business software or to perform some other complex task. I dare say because of its background the 2020 will be of particular interest to manufacturing companies as a means of getting a handle on production costs.

I'm impressed. The machine is a workhorse and should give good reliable service where personal computers just won't do the job. ❑

Specifications and Report Card

Unit:	CDS 2020
Made by:	Creswick Data Systems
Processor:	Z80B
Clock speed:	4.9152 MHz
RAM:	256 Kbyte (expandable to 400 Kbyte)
ROM:	Bootstrap only
I/O:	Four serial (up to seven) ports, two Centronics printer ports
Languages:	Just about any, except Whitesmith's C and others that require a large TPA
Keyboard:	Depends on your terminal
Display:	Depends on your terminal
Graphics:	Depends on your terminal
Peripherals:	Printer, comms, plotter
Expansion:	Additional RAM, etc, through STD bus
Best points:	Multi-user value
Worst points:	Fragmented disk space precludes really large files

Ratings:	Excellent	Very good	Good	Poor
Documentation:			•	
Ease of use:		•		
Functionality:	•			
Support:		•		
Value for money:		•		

Price:	$10,165
Review unit from:	Creswick Data Systems Pty Ltd, PO Box 150, Yagoona 2199. (02) 728-1299.

ONE COMPUTER BOTH 8

AUSTRALIAN COMPANY HAS MORE TO OFFER THAN INTERNATIONALS

THERE are a number of flaws in assuming that large international companies can provide a better product. In particular some Australian companies are able to provide support not matched by the "big guns" such as IBM, Apple, and Digital Corp. When phoning an IBM service centre can you speak directly with the people that designed the machine? Acoustic Electronic Developments, known nowdays as AED COMPUTERS have displayed an uncanny ability to provide superior product technology as well as service unsurpassed in the industry.

JUMP FROM PROGRAM TO PROGRAM — First for Australia

Previously CP/M-based microcomputers were only able to run one program after the other, resulting in their inability to reach full potential in minute-to-minute business activities.

Analysing small busineses it becomes apparent that businessmen are required to swap randomly from function to function. One moment they are production controllers, the next, sales persons, next the accountant, etc. By the very nature of office life they seldom finish one task before being interrupted by one more urgent.

The microcomputers inability to rapidly swap from function to function has been overcome by a revolutionary new operating system concept (MPS Multiple Program Selection) developed by AED At a touch of the keyboard the current task is saved in suspended animation. The user then selects one of nine other tasks, which complete with its screen image, is loaded into the computer and released. The swap takes only six seconds (about 20 times faster than conventional systems). When done with the new task the operator returns instantly to the original.

Swapping programs on conventional microcomputers is slow, requires many keystrokes, and normally there is no menu prompting. MPS, however, is extremely fast, requires only three keystrokes, and is completely menu assisted. Other attempts have been made to solve this problem by creating a fully integrated suite of programs. This approach yields an improvement though still suffers slow swap time and only specially written programs are available for the system. MPS resides in the operating system, therefore offers extreme speed and is compatible with any standard CP/M program.

SUPERAED — The CP/M your having when your not just having CP/M

In the first two years of manufacturing microcomputer systems AED became aware of many features that were not provided by the popular CP/M operating system. This shortcoming was holding back microcomputers from reaching their full potential in business, office automation and engineering applications.

Analysing alternative operating systems revealed that some had advantages in some areas but still lacked the end-user oriented features that were of primary concern. It appears that computer system programmers give total priority to hardware, disk file structures, programmers facilities, and the command power to impress engineers and technicrats. This explains why these operating systems, while more powerful, still lack the basic facilities that would make the computer infinitely more useful to the businessman, engineer, doctor, etc., that use it from day to day.

Solving this problem by designing a new op-system was due to the incredible software base available for CP/M. Other company's CP/M look-a-likes all have compatability problems and AED didn't want to join the list. The alternative of developing an extension package to CP/M was adopted with some startling results, all achieved without corrupting one byte of CP/M or it's CCP.

After 12 months in development AED released SUPERAED which was an immediate success leading to increased sales of the "AED SUPERCOMPUTER I" and drew considerable interest overseas. After a further 18 months development a new version with a unique multiple program selection capability (MPS) was released, along with a new computer "AED UNIVERSE Supercomputer II" which combined 8 & 16-bit operation in one machine.

Superaed provides many features unique to a CP/M-based system including:

Intelligent Terminal Driver. A special driver for the extremely fast AED UNSERIAL terminal, providing display speed control and intelligent software control over cursor and all screen characteristics.

Keyboard Substitution. Allowing application software to talk to the computer as though it were the operator. At last one program can use another to participate in the job at hand.

Automatic background memory testing. SUPERAED continuously scans the computers memory, warning the operator of any faults before they cause subtle data errors to creep into your files.

Selection of multiple printers. CP/M provides for only one printer. "SUPERAED" provides for 8 printers which may be selected directly from the keyboard or under software control. Orders can be automatically directed to a printer loaded with order forms, invoices to a printer with invoice forms, etc.

A powerful diagnostic monitor. This is one of the most startling features of "SUPERAED". Unlike other systems the monitor can be entered even when a CP/M program is in use. After using the monitor for diagnostics, experimental, or debugging purposes, you can return right back to the CP/M application. At last you can look deep into the software and hardware system of your computer while the sample is still under the microscope.

OPERATING SYSTEMS — TO GO

The majority of microcomputer systems have either 8-bit 8080, 8085, or Z80 CPUs or 16-bit 8086 or 8088 CPUs. The CP/M operating system has been adopted internationally as the standard for 8-bit machines. CP/M-86 and MS-DOS operating systems share the market for 16-bit machines. Owners of 8-bit machines are limited to 8-bit CP/M software of which there is an abundant variety. Owners of the technically superior 16-bit machines have access to a respectable, yet somewhat more limited variety of software. Choosing which machine to buy can become a nightmare when weighting-off performance, software availability, and the future. The AED UNIVERSE computer simplifies this choice offering the best of both worlds. By employing a software selectable dual 8 & 16-bit CPU the UNIVERSE can run all of the most popular operating systems: CP/M, MP/M, I/OS, Multi/OS, CP/M-86, MS-DOS and more to follow. This approach opens the door to a wide application software range than almost any other computer system. AED are planning to release

& 16-BIT

additional bus master CPUs such as 68000, 16032, and 80286, extending even further the range of operating systems available

HARDWARE — Built for speed and expandability

The AED UNIVERSE electronics is based on a 20 slot IEEE 696 S100 bus structure. This is the only bus endorsed by an international standards organisation. There are many systems that claim compatability with this standard but beware as compatability with and compliance to IEEE 696 mean two different things. An S100 system has many advantages over integrated proprietory systems as it offers greater expandability as products are available from a broad range of vendors. S100 tends to be the first to introduce new technology in a practical form and offers the greatest performance cost ratio.

The universe uses a dual 8 & 16-bit CPU which boasts the highest clock speeds available, that is 6MHz on the 8-bit and 8MHz on the 16-bit. The systems memory cards work in both the 8-bit and 16-bit modes making extension of the system to future 16-bit and 32-bit processors viable. The UNIVERSE employs intelligent Direct Memory Access (DMA) temporary bus master floppy and hard disk controllers employing there own processors to remove burden from the system CPU. This technique yields speed far exceeding systems from the large corporations.

Printer and communications input and output are handled by what must be the most powerful I/O system ever offered on a microcomputer system. This card has its own on board Z80 CPU combined with 256K-bytes of memory to dynamically buffer all input and output from the two centronics and two programmable serial ports. The card also boasts a clock calendar, programmable interrupt system, programmable counter timers, and a unique power supply monitoring system.

The UNIVERSES terminal is part of the computers main memory system making it several times faster than conventional serial terminals. In fact, the UN-SERIAL terminal is so fast that under WORDSTAR word processing software the UNIVERSE performs more like a sophisticated dedicated word-processor than a normal computer.

SUPPORT more the merrier

Engineering and service support for AED systems is second to none in the industry. Phoning an AED sales and service centre puts you in contact with engineers rather than salesmen. Usually the engineer was involved in one or more aspects of the machines electronic or operating system design. Few if any multi-nationals can offer this ready access to engineering support. AED has chosen as agents, engineering companies involved in sales instead of sales companies involved in engineering and provide complete engineering service and sales support in Sydney, Melbourne, and Canberra, and intend to soon include Brisbane, Adelaide, and Perth.

AED can provide complete System analysis and consultancy. SOFTAED a Sydney-based division of AED produces custom written applications where off-the-shelf software is not suitable. AED installs the systems and provides any necessary training.

Service contracts are available covering most of NSW and Victoria. AED were one, if not the first computer company in Australia to provide a one-year warranty, a true reflection of the reliability of the machines and the companies belief in them.

Oric-1 Review

The Oric-1 has just arrived in Australia from the U K where, if the advertising is to be believed, it is extremely popular. Evan McHugh investigates.

THE ORIC-1 is a cash-and-carry computer. The basic machine is small with several good features that should make it popular in Australia, but it also has some aspects that nag a little.

The entire works are housed in a compact, presentable case in blue, black and grey. The lettering on the keys is clear, and the keys are like those you find on a Texas Instruments calculator, only slightly larger – more about them later.

The expansion sockets are along the back of the machine and there is a power supply with a box that plugs into the mains. This has the slight disadvantage of having to go in at the end of a power board since it is so big that it is difficult to plug anything in next to it.

From left to right, the sockets at the of the machine back are: 9V DC power in, expansion bus, printer interface, cassette interface, colour monitor interface and T.V. interface. The amount of information provided on each interface varies. For example, there is plenty on the printer and cassette, but little on the expansion bus.

The Oric has 48K of Random Access Memory and 16K of Read Only Memory which contains a version of interpreted BASIC. The machine uses a 6502 processor and it supports assembly language which can be run from within BASIC.

Zap, Ping, Shoot ...

The basic model has a comprehensive range of commands similar to those of most machines of the same price. Additional features include four preprogrammed sounds: ZAP, PING, SHOOT and EXPLODE. There are three modes for using the monitor (the manual says there are four, but I could only find three): text mode, and hi-res and lo-res modes. There are also eight colours available and INK and PAPER commands to set foreground and background colours.

Numerous drawing, patterning and display commands can be used in relation to the various modes. There is also an alternative character set which can be used for creating images.

The program editing facilities are not very powerful. You will quickly find that a word processor is more useful if you have much editing to do.

Spiffing Manual

The manual is one of the most refreshing aspects of the Oric. It displays the typical English trait of trying, at the outset, to make something fairly difficult appear easy. As you progress the information becomes more and more complex until, when you reach the back, you are getting right into the very guts of the thing. By then you are working at a level where it helps to have a degree in something. It's a joy to have a manual that looks after the beginners at the front and the experts at the back. The volume is about 160 pages long with ring binding (hooray!) and a manageable A5 size.

Essentially a BASIC manual, it guides you through learning your first language and has several good features. First, it has a section on structured programming. It is not comprehensive, but it will let you know that there is such a thing as structured programming and should stimulate your interest in the subject.

Second, the manual has a summary of the BASIC instruction set at the back. This gives you a ready reference guide so that you don't have to wade through the whole manual looking for an explanation of an instruction. Every manual should have one.

The manual also has several appen-

dices which provide a great deal of technical information – the hackers will go bananas. There's a memory map, list of control characters, ASCII code chart, pin output chart, text screen map, high-res screen map, error code list, machine instruction list and more.

Software available for the Oric is oriented towards the games player. There are a few serious packages such as a word processor, some educational games, assemblers and disassemblers, a Forth package and monitor drivers.

The games are of high quality and just like those in arcades. Hopefully, more comprehensive software will appear on the market and other 6502 machine users will make some public domain software available.

A view of the underside of the Oric, showing its expansion slots at the back.

Only One Real Fault

I found our Oric computer to have only one real fault – the keyboard. How do you use a computer if you can't type on it? The Oric's designers did not have touch typists in mind when they invented this keyboard. The keys are too small and the travel is unbearable. The keyboard has raised surfaces across the top and bottom, which makes the space bar almost impossible to use, since your thumb stops going down before it has properly depressed the bar. What's worse, when you press down some keys they stay down (for the whole count)!

Apart from this problem, which isn't much of a drama if you are a two finger typist, the Oric is an inexpensive machine well worth a serious look. The manufacturers can be proud of their documentation and the machine capability. The 64K Oric retails for $399 and a model with 16K RAM is also available, at $299.

Your Computer's review machine came from Oric Computers, 691 Whitehorse Road, Mont Albert 3127. Phone: (03) 898 9533. ❑

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Have Computer Will

Destroying myths about microcomputer reliability is a hard task. One Queensland firm proved the robustness of its Toshiba micro by putting it on the back of a semi-trailer and hauling it several thousand kilometres to Rockhampton. Leigh and Barbara Hemmings tell the tale...

"MICROS REQUIRE an ivory tower, air conditioning, humidity control, and white-coated, highly paid technicians running frantically in all directions."

Destroying microcomputer myths is a hard task; some firms just rely on trying to talk sensibly about the required operating conditions for modern micros, but others demonstrate the new robustness and reliability of micros in more extreme ways. One Queensland firm that decided to put a computer on the back of a semi-trailer and haul it many thousands of kilometres to Rockhampton (to a Brahman cattle-breeders' convention), then out to the far west of the state, most certainly falls into the second category.

The firm is Shannon Robertson Systems, and this novel demonstration of faith in a product came about with typical Queensland country casualness, as Ralph Shannon explained.

"A client of ours who does powerline construction work on contract out of Longreach was buying a system to do his job costing and accounting. At the time he was here he said, 'You wouldn't want to go for a run to Longreach in an old truck I've just bought, would you?' I said okay, just for the fun of it, and also that I'd deliver his computer at the same time on the back of the truck. 'Oh no', he said, 'It's too bloody rough – you're not going to deliver *my* computer like that.'

"So I thought: why not? We were confident it would make it, and even if it didn't we could show the reality of Toshiba's modular construction replacement."

Sun, Surf And Computers

Aside from truck-mounted computers, Shannon Robertson Systems is unusual in another way as well. Instead of being located in Brisbane they chose Nambour, on Queensland's Sunshine Coast; lots of surf, sun, sand and whatever takes your fancy. Not a usual working environment for office-pale programmers, but apparently ideal for promoting high productivity.

As Ralph Shannon put it: "Being here, we offer a lot more and so get the best people to work for us. Our programmers have sailboards; if they want to go out and sail for the afternoon, they go. They then come back and work at night or early in the morning. If you give people a better working environment you get better productivity."

And productivity is vital. Initially the business was only Ralph Shannon and Peter Robertson, and what prompted them to get into the computer industry in the first place was a Department of Primary Industry seminar.

"It was the straw that broke the camel's back," said Ralph Shannon. "Supposedly rural management education on 'Computers and Agriculture', they proceeded to tell farmers about computer fraud, input and output devices, in short an absolute waste of a day."

Despite this frustration Ralph and Peter could see the value of computers in primary industry. After surveying potential customers (no one responded in a negative manner) and competitors (in 1980 there was virtually nothing on the market), they sat down and developed specifications for a range of packages, initially for the beef and cane industries.

The result was 'Beef Pack' and 'Cane Pack', each suite of programs designed to fulfil all the requirements of those two industries: recording the physical productivity, area analysis, and machinery cost analysis – 16 or 17 programs in each pack. They received endorsement from the Cane Growers' Council, put a few computers in the back of a car and went out on the road. They got 15 sales in that first year.

From there it should have been plain sailing, but at that stage they were buying their computers through a Brisbane firm, which was in turn buying through a Melbourne firm, which was importing from someone else in the USA. It was a long, long way back to the manufacturer. Too far.

"We needed a computer whose manufacturer was directly representing the product. That way we could get the support we needed, plus projection on new products so the development work we were doing would have application for as long a period as possible.

"Our attention was drawn to Toshiba; we tried them, liked them and redeveloped all our software for Toshiba computers. Ultimately, with more of our software on the Toshiba system than anybody else, Toshiba's attention was drawn to us. Since we had a high level of expertise, we were called upon to provide other software for Toshiba and to provide a consultancy service – and that has developed to the extent that we are very firmly Toshiba software consultants. Any software marketed under the Toshiba name in Australia is ours."

With full-time programmers on staff, as well as extensive rural packages, Shannon Robertson Systems has developed a broad range of small business software – debtors, general ledger, inventory, job costing, product scheduling. But the program that has had the greatest amount of development work done on it is Real Estate Property Management. They estimate having done about 5000 hours' work on the program, not counting nearly 18 months spent in liaison with industry organisations. It now has endorsement by the Real Estate Institute of Queensland – the first package endorsed by that Institute.

Define Your Needs Before Buying

However, Shannon Robertson doesn't see any point in developing a massive program unless it's going to relate to the potential market.

"Rather than developing a program, then taking it out and trying to fit it to a business, we always adopt a front-end marketing approach to the whole thing: find out what the problem is, what the requirements are, and work back to the

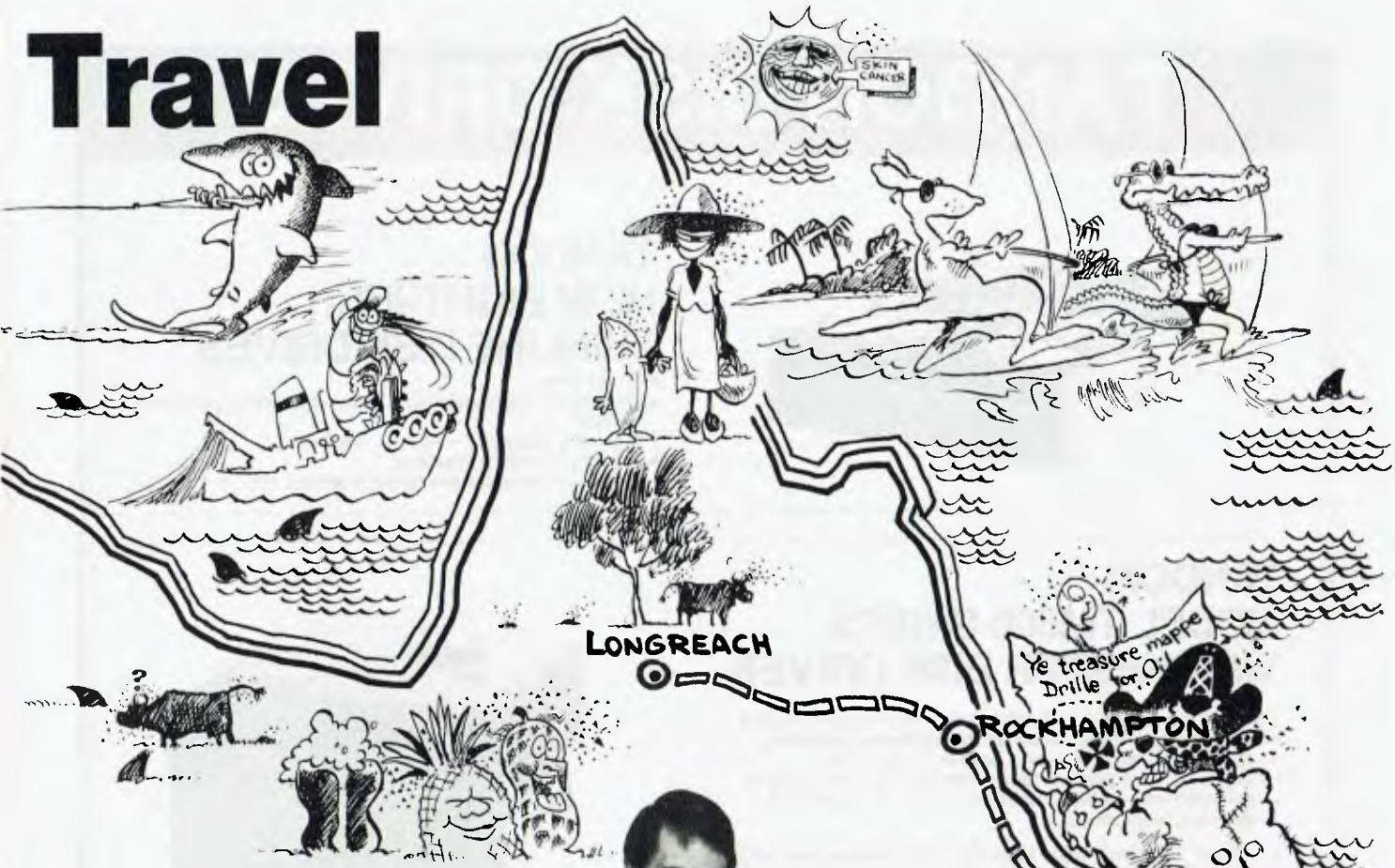
In doing this they feel it is vital that anyone contemplating installing a computer should sit down first and decide what the problems are, how they want to solve those problems, and, interestingly enough, establish what they don't want the computer to do.

By defining problems and needs before talking to a computer consultant, a better understanding develops from both the systems analyst/programmer side and the client's side.

Shannon Robertson's best clients are those who have had experience with a bureau and/or accounting machines. This type of client knows the advantages and disadvantages of computers. The problem clients are those who bought a system on a whim.

To counteract this type of client, there needs to be much more computer education within industry. Like many firms in their situation, Shannon Robertson spend much of their time selling the concept of computers, as much as selling

Travel



their products and what they have to offer as a company. A short while ago, when promoting new concepts you would run against people who were implacably opposed to the idea of computers. Maybe today this is changing.

"In all the demonstrating and seminars we have done we never had anyone say, 'That's a load of rubbish'. The comment is always, 'It's a thing of the future'. Most people see computers not as a matter of *if*, but rather a matter of *when*. The only people who don't have that idea are the really old guys who feel they would rather leave the decision to their son or daughter. But there again, other guys aged 65, 70 and more are delighted with the idea of computers and want to get right into it."

Back To That Truck

And finally back to that Toshiba computer experiencing the Australian environment first-hand on the back of a truck heading for Longreach. Its arrival will cause a lot of interest in the district, and it's growing, vital interest that isn't really being met with sufficient information or product availability.

"One thing really glares out: it's not only primary producers, but also people in provincial towns, like Longreach, who feel left out on a limb as regards to technology. They are delighted to talk to someone who is in the mainstream of technological advances, just to find out what's going on." ❑

Left: Peter Robertson showing the Toshiba's modular construction. Below: Ralph Shannon with the computer, ready to start on its long journey.

TANDON DISK DRIVES

TANDON
NEW EIGHT-INCH
THINLINE DISK DRIVES

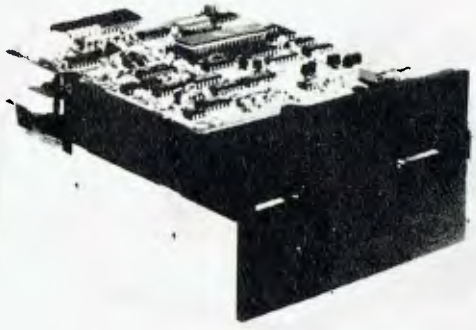
- Direct drive.
- Proprietary, high-resolution, read-write heads patented by Tandon.
- D.C. only operation—no A.C. required.
- Industry standard interface.
- Three millisecond track-to-track access time.

TANDON
MODEL TM500 SERIES
WINCHESTER DISK DRIVES

Tandon's low cost 5¼" rigid disk drive features an on-board microprocessor which calculates the optimum positioning algorithm, yielding an Average Access Time of 110 milliseconds. This product family includes 1, 2, and 3 platter models with unformatted capacities of 6.4, 12.8, and 19.1 megabytes, respectively.

Up to four Tandom TM500's can be daisy-chained on a single bus, which provides a capability of up to 76 megabytes of on-line storage (unformatted) in a single system.

These drives are compatable with controllers that use an industry standard interface (ST 506).



Tandon
Model TM-100
Mini-Floppy
Disk Drives

Tandon's TM-100 family of mini-floppies offer the absolute highest storage capabilities of any 5¼" high-speed, random access disk drive available in two single head and two double head models, all double density.
Unsurpassed Storage Capacity—Up to an incredible 1000K bytes information on 160 tracks. Recording density is 5877 BPI.
Advanced Dual-Head Design—Tandom Magnetics has for years been the leading designer and supplier of read/write heads to most major disk drive manufacturers.
Increased Throughput—Tandon's TM-100 have a track-to-track access time of only 5 milliseconds (an incredible 3 milliseconds double track density).
Proven Reliability—Designed for total reliability, as demonstrated by more than 50,000 production models in operation.

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Gold Digger for ZX80

By Paul Vandenberg,
Cabramatta, NSW

The idea of this game is to collect as many gold (light dots) pieces as possible, without running into any walls (dark dots and lines).

Use the keys 5, 6, 7, 8 to move your character around the screen, not forgetting to press return after each move.

Incidentally, the score is POKEd onto the screen using a digits column, tens column and a hundreds column.

Note: Your ZX80 needs at least 2K of RAM to run this game.

```
1 LET W=Ø
2 LET Y=Ø
3 PRINT"SCORE=ØØØØ",,,
4 FOR F=1 TO 21
5 PRINT,,,,
6 NEXT F
7 LET C=128
8 LET B=2
9 FOR F=1 TO 2
1Ø FOR A=1 TO 32
11 GOSUB 9ØØØ
12 NEXT A
13 LET B=22
14 NEXT F
15 LET A=32
16 FOR B=3 TO 21
17 GOSUB 9ØØØ
18 NEXT B
19 LET A=1
2Ø FOR B=3 TO 21
21 GOSUB 9ØØØ
22 NEXT B
23 FOR F=1 TO 20
24 LET A=RND(3Ø)+1
25 LET B=RND(19)+2
26 GOSUB 9ØØØ
27 NEXT F
3Ø LET C=9
31 FOR F=1 TO 1Ø
32 LET A=RND(3Ø)+1
33 LET B=RND(19)+2
34 GOSUB 9ØØØ
35 NEXT F
36 LET YH=RND(3Ø)+1
37 LET YV=RND(19)+2
38 LET YC=CODE("Y")
39 LET BC=128
4Ø LET A=YH
41 LET B=YV
42 LET C=YC
43 GOSUB 9ØØØ
44 LET P=Ø
45 LET GO=1
46 LET C1=Ø
49 LET C2=Ø
5Ø REM: INPUT GO
9Ø INPUT G
92 IF P=1Ø THEN GOSUB 3ØØ
94 IF C1=1Ø THEN GOSUB 31Ø
1Ø1 LET C=Ø
1Ø2 LET A=YH
1Ø3 LET B=YV
1Ø4 GOSUB 9ØØØ
1Ø5 IF G=5 THEN LET YH=YH-1
1Ø6 IF G=8 THEN LET YH=YH+1
1Ø7 IF G=6 THEN LET YV=YV+1
1Ø8 IF G=7 THEN LET YV=YV-1
1Ø9 LET A=YH
11Ø LET B=YV
111 GOSUB 9ØØ4
112 IF C=128 THEN GOTO 9Ø1Ø
113 IF C=9 THEN LET P=P+1
114LET C=P+28
116 LET A=1Ø
117 LET B=1
118 GOSUB 9ØØØ
119 IF GO=(GO/1Ø)*1ØTHEN GOSUB 18Ø
12Ø LET A=YH
121 LET B=YV
122LET C=YC
123 GOSUB 9ØØØ
124 LET A=YH+RND(2)-1
125 LET B=YV+RND(2)-1
126 LET C=BC
129 GOSUB 9ØØØ
13Ø LET GO=GO+1
131 GOTO 9Ø
18Ø LET C=9
182 LET A=RND(3Ø)+1
183 LET B=RND(19)+2
181 FOR F=1 TO 2
184 GOSUB 9ØØØ
185 NEXT F
186 RETURN
3ØØ LET C1=C1+1
3Ø1 LET P=Ø
3Ø2 LET C=C1+28
3Ø3 LET B=1
3Ø4  LET A=9
3Ø5 GOSUB 9ØØØ
3Ø6 RETURN
31Ø LET C2=C2+1
311 LET C1=Ø
312 LET C=C2+28
313 LET B=1
314 LET A=8
315 GOSUB 9ØØØ
316 RETURN
9ØØØ LET W=(B-1)*33+A
9ØØ1 LET Y=PEEK(16396)+PEEK(16397)*256
9ØØ2 POKE W+Y,C
9ØØ3 RETURN
9ØØ4 LET W=(B-1)*33+A
9ØØ5 LET Y=PEEK(16396)*256+PEEK(16397)
9ØØ6 LET C=PEEK(W+Y)
9ØØ7 RETURN
9Ø1Ø CLS
9Ø2Ø PRINT"SORRY, YOUR DEAD."
9021 PRINT"YOU GOT ";C2;C1;P;" POINTS"
9022 PRINT"IN ";GO;" GOES"
```

Graffiti for ZX81

By Jason Teh, Doncaster, VIC.

THIS PROGRAM is for a ZX81 with 1K of memory, and it enables the user to write letters which are eight times larger than normal!

Any key pressed will result in an enlarged version on the screen of that character. For a space, you have to press NEWLINE because the space key acts as BREAK. Pressing SHIFT and NEWLINE together will copy the screen to the printer. It also does this automatically when you fill the whole screen.

As listed, you can fit in eight characters to a line and, with a 16K machine, fill up the whole screen. However, on a 1K machine you will find you run out of memory after three lines or 24 characters.

'Graffiti' works by looking at the character set dots in the ZX81 ROM at address 7680, which contains all the possible characters. Each character is stored as eight binary bytes, with eight 'bits' each. This program tests each 'bit' and if it is set, the program PLOTs a pixel and the FOR/NEXT loops then control the position of the pixels on screen.

This program can also RUN on a ZX80 with 8K ROM.

```
GRAFFITI - BY JASON TEH (C)
```

```
 1 REM GRAFFITI 27/2/83
10 LET Y=43
20 FOR C=1 TO 8
30 PAUSE 4E4
40 POKE 16437,255
50 LET M=CODE INKEY$
60 IF M=118 THEN GOTO 160
70 IF M=121 THEN GOTO 190
80 FOR N=0 TO 7
90 LET L=PEEK (7680+N+8*M)
100 FOR X=1 TO 8
110 LET L=L/2
120 IF L<>INT L THEN PLOT 8*C-X,Y-N
130 LET L=INT L
140 NEXT X
150 NEXT N
160 NEXT C
170 LET Y=Y-8
180 IF Y>6 THEN GOTO 20
190 COPY
```

Eye Robot for Sinclair

By D. Thorpe, Glemunga, SA

YOU ARE one of a party of four humans being hunted through a dark building by four robots. Your group is armed with a laser cannon and six shots. A robot's only weakness is the half-second needed for its search-and-aim mechanism to operate. Each robot is able to produce a hologram, or image of itself. Now a fake robot is in itself no threat, but you only have six shots, so you shouldn't waste any blasting at apparitions. If you find yourself with fewer shots than deadly robots, you are obviously doomed. A robot can come through one of two doors, so you need to watch both.

A real robot will zap you half a second after it first appears, unless you get it first by pressing NEWLINE. If pressed within the first half-second the NEWLINE key acts as a trigger of the laser cannon. After half a second it reverts to simply being the NEWLINE key. So, if a hologram robot appears, you need to refrain from pressing NEWLINE until after half a second has passed. The two types of robot appear identical, except the real ones has two white eyes. So the rule is "Don't fire till you see the whites of their eyes". *(Oh no! – Ed.)* If you can get four dismembered robots on the screen, you have saved the earth.

How to play:

1. Enter the program and press RUN.
2. Be ready when you press NEWLINE. The first robot (real or fake) will appear at some random instant within the next two seconds. You will need only the NEWLINE key from then on.

GOOD LUCK!

```
10  LET Q = 500                       Set reaction time
20  LET H = 4                         Number of humans
30  LET M = 16414                     Reference for timer
40  LET S = 0                         Number of robots destroyed
50  LET Z = 6                         Number of shots in cannon
60  CLS
70  LET R = RND(2)                    For deadly or fake robot
80  LET P = RND(3)                    For place robot appears
90  LET A = RND(500)                 } For a random period of up to
100 FOR K = 1 TO A                   } two seconds of dark screen,
110 PRINT K;                         } before robot appears
120 CLS                              }
130 NEXT K                           }
140 POKE M,0                          Sets timer to zero
150 POKE M + 1,0
160 IF P = 1 THEN GOSUB 610          } Prints robot graphics, real
170 PRINT "▝▀";CHR$(127+R);"▀▘"      } or fake. P = 1 shifts the
180 IF P = 1 THEN GOSUB 610          } graphics to the right
190 PRINT CHR$(131);"U";CHR$(131)    }
200 IF P = 1 THEN GOSUB 610          }
210 PRINT CHR$(130);CHR$(131);"▌"    }
220 PRINT
230 INPUT C$                          Stops timer
240 LET T=(PEEK(M)+PEEK(M+1)-4)*20   } Calculates and prints time
250 PRINT "TIME▲";T;"▲MILLISECS"     } elapsed in milliseconds
260 IF R = 1 AND T>Q THEN GOTO 370   }
270 IF R = 1 THEN GOTO 440           } Consequences of your action
280 IF R = 2 AND T>Q THEN GOTO 490   }
290 LET Z = Z - 1                     One less shot left
300 LET S = S + 1                     One more robot destroyed
310 FOR B = 1 TO S                   } Prints required
320 PRINT"▄O▀":CHR$(145);"▌▄▀:";     } number of
330 NEXT B                           } dismembered robots
340 IF S = 4 THEN GOTO 540
350 PRINT
360 GOTO 400
370 PRINT "GOOD"
380 PRINT
390 GOSUB 590
400 PRINT
410 PRINT "PRESS N/L"                } For the next
420 INPUT E$                         } confrontation
430 IF E$="" THEN GOTO 60
440 LET Z = Z - 1                     One less shot left
450 PRINT "FOOLED"
460 GOSUB 590
470 IF Z<4 - S THEN GOTO 550
480 GOTO 400
490 LET H = H - 1
500 PRINT H ; "▲HUMANS SURVIVE"       Feedback on present situation
510 IF H = 0 THEN GOTO 550
520 GOTO 400
530 PRINT
540 PRINT "YOU WIN"
550 PRINT"ANOTHER GO?PRESS Y OR N"
560 INPUT D$
570 IF D$="Y" THEN GOTO 10
580 IF D$="N" THEN LIST
590 PRINT Z; "▲SHOTS AND▲";           Feedback on present situation
    4 - S ; "▲ROBOTS LEFT"
600 RETURN
610 PRINT ,,;
620 RETURN
```

Try and Catch Me for ZX80

By Paul Vandenberg, Cabramatta, NSW

Note: Your ZX80 needs at least 2K of RAM to run this game.

The idea of this game is to collect as many stars as possible before getting trapped. It is not as easy as it sounds as you are constantly being surrounded by dark blocks. You must not run into either the light blocks (border) or the dark blocks unless you are completely trapped. To make things even harder, some of the stars disappear if you don't get to them quickly enough.

5 = Left, 6 = Down, 7 = Up, 8 = Right

You have to make a few moves before the first star appears.

SINCLAIR

```
      "BET YA CAN'T CATCH ME"
 1 LET W=Ø
 2 LET Y=Ø
 3 PRINT"SCORE=Ø    ",,,
 4 PRINT"    (32*shift(A))          "
 5 FOR F=1 TO 16
 6 PRINT"(1*shift(A)",,,"(17 spaces)(1*shift(A))"
 7 NEXT F
 9 PRINT" (32*shift(A))         "
 10 LET G=Ø
 11 LET SC=Ø
 12 LET H=RND(30)+1
 13 LET V=RND(16)+2
 14 LET SH=Ø
 15 LET SV=Ø
 16 LET A=H
 17 LET B=V
 18 LET C=CODE("Y")
 19 GOSUB 9000
 40 INPUT M
 41 LET A=H
 42 LET B=V
 43 LET C=Ø
 44 GOSUB 9000
 45 IF M=5 THEN LET H=H-1
 46 IF M=8 THEN LET H=H+1
 47 IF M=7 THEN LET V=V-1
 48 IF M=6 THEN LET V=V+1
49 LET A=H
 50 LET B=V
 51 GOSUB 9004
 52 IF C=20 THEN GOSUB 8000
 53 IF C=128 OR C=9 THEN GOTO 1000
 54 LET A=H
 55 LET B=V
 56 LET C=CODE("Y")
 57 GOSUB 9000
 58 LET Z=RND(4)
 59 LET C=128
 60 LET A=H
 61 LET B=V
 62 IF Z=2 THEN LET B=V-1
 63 IF Z=4 THEN LET B=V+1
 64 IF Z=1 THEN LET A=H-1
 65 IF Z=3 THEN LET A=H+1
 66 GOSUB 9000
 67 LET G=G+1
 68 IF G=(G/7)*7 THEN GOSUB 2000
 69 IF G=((G/25)*25) THEN GOSUB 3000
 999 GOTO 40
 1000 REM SCORE
 1001 PRINT"YOU GOT A SCORE OF ";SC
 1002 PRINT"YOU ALSO IASTED ";G;" GOES."
 1003 STOP
 2000 LET SH=RND(30)+1
 2001 LET SV=RND(16)+2
 2002 LET B=SV
 2003 LET A=SH
 2006 LET C=20
 2007 GOSUB 9000
 2008 RETURN
 3000LET A=SH
 3001 LET B=SV
 3002 LET C=Ø
 3003 GOSUB 9000
 3004 RETURN
 8000 LET SC=SC+5
 8001 LET P=1
 8002 LET S$=STR$(SC)
 8003 LET S1=CODE(S$)
 8004 IF CODE(TL$(S$))=1 THEN GOTO 8020
 8005 LET S2=CODE(TL$(S$))
 8006 IF CODE(TL$(TL$(S$)))=1 THEN GOTO 8020
 8020 LET A=7
 8030 LET C=S1
 8031 GOSUB 9000
 8032 IF SC<10 THEN RETURN
 8033 LET A=8
 8034 LET C=S2
 8035 GOSUB 9000
 8036 RETURN
 9000 LET W=(B-1)*33+A
 9001 LET Y=PEEK(16396)+256*PEEK(16397)
 9002 POKE W+Y,C
 9003 RETURN
 9004 LET W=(B-1)*33+A
 9005 LET Y=PEEK(16396)+256*PEEK(16397)
 9006$00  LET C=PEEK(W+Y)
 9007 RETURN
```

COMMODORE

Sprite Racer for Commodore 64

By Justin Bridgman-Lee, Stirling, SA

The aim of this game is to stay on the road for as long as possible. If you touch the edge of the road (in red) you will skid, which may force you off the road.

The controls are:
'A' - to move left
'B' - to move right

At the end of the game you will be rated depending on your score.

```
10 V=53248:POKE 2042,13
15 POKE 53281,1:POKE 53280,5
20 FOR M=0 TO 62:READ D:POKE 832+M,D:NEXT M
25 POKE 54296,15:POKE 54277,255:POKE 54278,255:POKE 54276,33
30 POKE V+23,4:POKE V+29,4:POKE V+41,5
35 PRINT"■";
40 X=162:S=0
45 XX=16:POKE 54273,4:POKE 54272,0
50 FOR N=1 TO 25:PRINT TAB(XX);"■ ■          ■ ■":NEXT
55 POKE V+5,60:POKE V+4,X:POKE V+21,4
60 FOR N=1 TO 40:POKE 54272,N:FOR M=1 TO 10:NEXT:NEXT
65 R=INT(RND(1)*3)-1
70 XX=XX+R
75 IF XX>29 OR XX<2 THEN XX=XX-R*2
80 FOR M=1 TO 6:PRINT TAB(XX);"■ ■          ■ ■":NEXT
82 IF X<18 THEN X=18
83 IF X>298 THEN X=298
85 P=55496+(X-18)/8
90 IF PEEK(P)=1 OR PEEK(P+4)=1 THEN 500
92 IF PEEK(P)=2 OR PEEK(P+4)=2 THEN POKE 54276,129:FOR M=1 TO 50:NEXT:POKE
54276,33
95 IF PEEK(P)=2 OR PEEK(P+4)=2 THEN X=X+(INT(RND(1)*3)-1)*8:POKE
V+16,INT(X/256)*4
96 IF PEEK(P)=2 OR PEEK(P+4)=2 THEN POKE V+4,X-INT(X/256)*256:GOTO 82
100 GET K$:X=X+(K$="A")*8-(K$="=")*8
102 IF K$="A" OR K$="=" THEN POKE 54296,0:FOR N=1 TO 20:NEXT:POKE 54296,15
105 POKE V+16,INT(X/256)*4
110 POKE V+4,X-INT(X/256)*256
115 S=S+10
120 GOTO 65
500 POKE 54276,129:FOR N=1 TO 100:NEXT
501 FOR N=1 TO 5:POKE V+41,2:FOR M=1 TO 100:NEXT:POKE 53280,2:POKE 53281,7
505 POKE V+41,6:FOR M=1 TO 100:NEXT:POKE 53281,1:POKE 53280,5:NEXT
506 POKE 54296,0
510 POKE V+21,0:PRINT"■■";
520 PRINT " YOU SCORED:";S;" POINTS"
521 IF S<200 THEN PRINT" A TWO YEAR OLD COULD DRIVE BETTER!!":GOTO 530
```

COMMODORE

```
522 IF S<500 THEN PRINT" WOMAN DRIVER!!":GOTO 530
523 IF S<1000 THEN PRINT" MANIAC!!":GOTO 530
524 IF S<1500 THEN PRINT" AVERAGE!!":GOTO 530
525 IF S<3000 THEN PRINT" GOOD!!":GOTO 530
526 IF S<5000 THEN PRINT" EXCELLENT!!"
527 IF S>=5000 THEN PRINT" YOU MUST HAVE CHEATED!!"
530 PRINT"[■■■■] PLAY AGAIN?"
535 GET A$:IF A$<>"Y" AND A$<>"N" THEN 535
540 IF A$="Y" THEN 25
550 PRINT"[■■] GOOD BYE!!":END
1000 DATA 0,0,0,0,102,0,0,102,0,1,255,128,27,255,216,27,255,216,31,129,248
1010 DATA 27,0,216,27,0,216,3,129,192,3,255,192,3,255,192,3,255,192,3,255,192
1020 DATA 27,255,216,31,255,248,27,255,216,3,255,192,1,255,128,0,195,0,0,0,0
```

MICROBEE

Hangman for the Microbee

By Mark Giandomenico, Quirindi, QLD

IT'S THE OLD 'guess the word the computer's thinking of' game.

```
00060 REM ########## HANGMAN ##########
00070 REM ##     WRITTEN   13/2/83     ##
00080 REM ##  BY  MARK GIANDOMENICO   ##
00090 REM ################################
00095 REM
00100 CLS:PRINT
00110 PRINT 'Hello and welcome to ";:UNDERLINE:PRINT"HANGMAN";:NORMAL:PRINT"."
00120 PRINT 'Do you require instructions (Y/N)?"
00130 A0$=KEY:IF A0$="" THEN 130
00140 IF A0$="y"THEN 180
00150 IF A0$="n"THEN 230
00160 IF ASC(A0$)>64 AND ASC(A0$)<91 THEN PRINT"Press ";:UNDERLINE:PRINT"LOCK";:
NORMAL:PRINT" Key.":GOTO 130
00170 GOTO 130
00180 PRINT:PRINT "The object of HANGMAN is to guess the word I am thinking of "
!
00190 PRINT "before the little stick man is hung! ";:UNDERLINE:PRINT" N.B. Lower
 case only":NORMAL
00200 CURS 17,8:PRINT "HIT ANY KEY TO CONTINUE"
00210 A0$=KEY:IF A0$=""THEN210
00220 DIM Y1(50)
00230 A=INT(RND*5)+1:REM Change "5" to the number of words
00240 ON A GOSUB 440,450,460,470,480:REM Add line numbers for   new words here.
00250 B=LEN(Z1$)
00260 C=B
00270 CLS:CURS11,2:PRINT "MY WORD HAS "B" LETTERS"
00280 FOR X=1 TO B:POKE 61900+X,95:NEXT X
00290 CURS 10,15:PRINT "** ENTER A WORD OR LETTER **";
00300 INPUT Y1$
00310 IF Y1$=Z1$ THEN 410
00320 K=SEARCH(Z1$,Y1$):IF K=0 THEN 500
00330 FOR I=1 TO 10
00340 K=SEARCH(Z1$,Y1$,I)
00350 IF K=0 THEN NEXT*I 380
00360 CURS 13+K,8:PRINTY1$
00370 NEXT I
00380 FOR J=1TO B
00390 IF PEEK(61900+J)=95 THEN NEXT*J 290
00400 NEXT J
00410 PRINT:PRINT '*** You got it! The word I was thinking of was "Z1$"."
00420 GOTO 730
00430 REM      *** VOCABULARY ***
00440 Z1$="auditorium":RETURN
00450 Z1$="claustrophobia":RETURN
00460 Z1$="discriminate":RETURN
00470 Z1$="gauntlet":RETURN
00480 Z1$="genealogy":RETURN
00490 REM *** ADD NEW WORDS HERE ***
```

```
00500 Q=Q+1
00510 LORES
00520 PLOT 105,7 TO 115,7:REM    BASE
00530 PLOT 110,7 TO 110,35:REM   POST
00540 IF Q=1 THEN 290
00550 PLOT 110,35 TO 85,35:REM   ARM
00560 IF Q=2 THEN 290
00570 PLOT 86,35 TO 86,30:REM    ROPE
00580 IF Q=3 THEN 290
00590 FOR I=1 TO 13
00600 PLOT 79+I,7 TO 79+I,15
00610 NEXT I
00620 IF Q=4 THEN 290
00630 PLOT 83,29 TO 89,29 TO 89,25 TO 83,25 TO 83,29
00640 PLOT 86,25 TO 86,20:PLOT 80,23 TO 92,23
00650 PLOT 84,15 TO 84,20 TO 88,20 TO 88,15
00660 CURS 10,10:PRINT"This is your last chance !!!!!!"
00670 IF Q=5 THEN 290
00680 FORI=1TO13:PLOTI79+I,7TO79+I,15:NEXTI
00690 PLAY 4,2:4,2:4:4,2:7,2:6:6:4:4:3:4,2
00700 CURS 10,10:PRINT"You've been HUNG !!!!!
00710 PRINT"The word was '"Z1$"."
00720 Q=0
00730 PRINT"Would you care for another try (Y/N)?"
00740 A0$=KEY:IF A0$="" THEN 740
00750 IF A0$="y" THEN 230 ELSE END
```

Graphic Painter for Microbee

By Tony Lock, Mitcham, VIC

'Graphic Painter' is a program I designed simply because I was frustrated by the length of time it took to draw simple graphical designs on the VDU screen.
If using the PLAY 0,1 function, you will not lose track of where the dot is as it will appear for 1/4 of a second before disappearing.

If you want more detailed designs, change line 3150 to read "CLS:HIRES" and change the maximum X and Y values, stated in lines 3170, 3190, 3330 and 3350, to 512 and 256 respectively. With a few simple alterations, you could even make painting diagonally possible.

```
03000 REM "GRAPHIC PAINTER" by Anthony William Lock
03010 CLS:CURS 17,1:UNDERLINE:PRINT"*** GRAPHIC PAINTER ***":NORMAL
03020 CURS 17,3:PRINT"PAINTING INSTRUCTIONS:"
03030 CURS 19,4:PRINT"To move uP Press U"
03040 CURS 18,5:PRINT"To move down Press N"
03050 CURS 17,6:PRINT"To move to left Press H"
03060 CURS 16,7:PRINT"To move to right Press J"
03070 CURS 17,9:PRINT"ERASING INSTRUCTIONS:"
03080 CURS 19,10:PRINT"To move uP Press E"
03090 CURS 18,11:PRINT"To move down Press X"
03100 CURS 17,12:PRINT"To move to left Press S"
03110 CURS 16,13:PRINT"To move to right Press D"
03120 CURS 20,15:PRINT"PRESS G TO START"
03130 K1$=KEY$:IF K1$="G" THEN 3150
03140 GOTO 3130
03150 CLS:LORES
03160 X=64:Y=24
03170 IF X>127 THEN LET X=127
03180 IFX<0 THEN LET X=0
03190 IF Y>47 THEN LET Y=47
03200 IFY<0  THEN LET Y=0
03210 SET X,Y
03220 A1$=KEY$
03230 IF A1$="U" THEN LET Y=Y+1:GOTO 3170
03240 IF A1$="N" THEN LET Y=Y-1:GOTO 3170
03250 IF A1$="J" THEN LET X=X+1:GOTO 3170
03260 IF A1$="H" THEN LET X=X-1:GOTO 3170
03270 IF A1$="E" THEN LET Y=Y+1:GOTO 3320
03280 IF A1$="X" THEN LET Y=Y-1:GOTO 3320
03290 IF A1$="D" THEN LET X=X+1:GOTO 3320
03300 IF A1$="S" THEN LET X=X-1:GOTO 3320
03310 GOTO 3220
03320 IF Y<0 THEN LET Y=0
03330 IF Y>47 THENLET Y =47
03340 IF X<0 THEN LET X=0
03350 IF X>127 THEN LET X =127
03360 SET X,Y:PLAY 0,1:RESET X,Y:GOTO 3220
```

Memory Dump for Microbee

By David Morrison, East Ringwood, VIC

Often it is necessary to incorporate a machine language program or lengthy data into a BASIC program. This can become a very tedious process so I have developed a procedure that PEEKs data out of memory and creates a program of BASIC DATA statements and stores it to tape. The created program can then be merged into another program by the IN #3 command.

Two subroutines are used:
320-340 A useful hexadecimal to decimal converter.
350 Peeks data out of memory.

This program can also be used to create files for PCG data if the characters are already in the PCG memory beforehand. The program will run in either the Microbee 16K or 32K standard computer.

```
00100 CLS:PRINT"BASIC MEMORY DUMPING PROGRAM":PRINT
00110 INPUT"Starting address (hex)?";A1$:GOSUB 320:A=Z
00120 IF W=-1 THEN 110
00130 INPUT"Ending address (hex)?";A1$:GOSUB 320:B=Z
00140 IF W=-1 THEN 130
00150 IF B<A THEN PRINT"ERROR":GOTO 110
00160 INPUT"Start of line numbering (dec)?";C
00170 INPUT"Increment of line numbering (dec)?";D
00180 PRINT:INPUT"Press RETURN when tape is ready?";A1$
00190 PRINT"Outputting to tape":OUT #3 ON:W=-1
00200 A1$=STR$(C):PRINT A1$(;2);:C=C+D
00210 PRINT" FOR A=";A;" TO";B;":READ B:POKE A,B:NEXT A";
00220 FOR Y=0 TO 500:NEXT Y
00230 FOR Z=A TO B:IF W=0 AND POS<59 THEN 260
00240 PRINT:A1$=STR$(C):PRINT A1$(;2);" DATA ";
00250 GOSUB 350:C=C+D:GOTO 270
00260 PRINT",";:GOSUB 350
00270 W=0:NEXT Z:PRINT CHR$(26):OUT #0:PRINT
00280 PRINT"Rewind tape, press RETURN to merge program,"
00290 INPUT"or type NEW to clear memory before merge.";A1$
00300 PRINT"Inputting from tape":IN #3
00310 IF A1$="NEW" THEN NEW ELSE END
00320 V=1:W=0:Z=0:FOR X=LEN(A1$) TO 1 STEP -1:Y=ASC(A1$(;X,X))
00330 IF Y<48ORY>70OR(Y>57ANDY<65)THENPRINT"ERROR":W=-1:RETURN
00340 Z=Z+V*(Y-48+(Y>57)*7):V=V*16:NEXT X:RETURN
00350 A1$=STR$(PEEK(Z)):PRINT A1$(;2);:RETURN
```

Asteroids for Microbee

By Denis Crowdy, Darlington, WA

This program simulates piloting in an asteroid belt followed by a trip through the space lanes. If your Microbee runs at more than 2 MHz (the colour and 64K versions) then you will have to add a delay at line 425 to bring the program to a more playable speed.

425 FOR L=1 TO 30:NEXT L is sufficient, though you can alter the speed by changing the loop value.

```
00100 REM ASTEROIDS
00110 REM By Denis Crowdy
00120 REM May 1983
00130 CLS
00140 POKE 220,16:POKE 257,1
00150 CURS 27,7:UNDERLINE:PRINT "ASTEROIDS":NORMAL
00160 PLAY 0,8
00170 CLS
00180 REM            Introduction
00190 PRINT "   You are the spaceship at the top of the screen,and it is your";
00200 PRINT "job to safely guide it through the dreaded asteroid belt..."
00210 PRINT "   Once you are through however,you will find yourself to be"
00220 PRINT "stuck in the space-lanes (unfortunately heading in the wrong"
00230 PRINT "direction!!!) due to navigational malfunctions..."
00240 CURS 29,7:PRINT "<=LEFT"
00250 CURS 29,8:PRINT ">=RIGHT"
00260 CURS 21,10:PRINT "GOOD LUCK COMMANDER!!!"
00270 CURS 20,16:PRINT "HIT ANY KEY TO START...";
00280 A1$=KEY:IF A1$="" THEN 280
00290 CLS
00300 RESTORE:GOSUB 450          :REM Data for PCG
00310 PCG
00320 X=32 S=61568:C=0:B=0
00330 REM            Main Section
00340 A1$=KEY:IF A1$="" THEN 380
```

MICROBEE

```
00350 IF A1$="," THEN LET N=-1
00360 IF A1$="." THEN LET N=1
00370 X=X+N:G=1
00380 CURS INT(RND*64)+1,16:IF C>2000 THEN PRINT "HI" ELSE PRINT "G"
00390 CURS X,1:PRINT " ABC "
00400 CURS X,2:PRINT " DEF ";
00410 IF G=1 THEN LET X=X+N
00420 IF PEEK(S+X)<>32 OR PEEK(S+X+I)<>32 OR PEEK(S+X+2)<>32 THEN 630
00430 C=C+10:GOTO 340
00440 REM           Read Data for PCG
00450 FOR I= 64528 TO 64528+(16*9)-1
00460 READ D
00470 POKE I,D
00480 NEXT I
00490 FOR I=64000 TO 64015
00500 POKE I,0
00510 NEXT I
00520 RETURN
00530 REM    Data Section for PCG
00540 DATA 8,8,24,52,110,82,86,44,126,60,24,24,24,27,30,24
00550 DATA 24,24,24,52,74,110,86,44,126,60,24,36,231,0,0,0
00560 DATA 16,16,24,44,82,106,82,44,126,60,24,24,24,216,120,24
00570 DATA 24,24,30,27,24,24,16,16,16,0,0,0,0,0,0,0
00580 DATA 0,0,60,36,165,90,66,36,36,36,24,24,24,24,24,24
00590 DATA 24,24,120,216,24,24,8,8,8,0,0,0,0,0,0,0
00600 DATA 24,102,110,197,145,133,118,102,60,36,60,24,26,24,24,8
00610 DATA 1,1,1,1,2,66,68,68,72,73,81,225,224,255,224,224
00620 DATA 128,128,128,128,64,66,34,34,18,146,138,135,7,255,7,7
00630 RETURN
00640 REM           CRASH!
00650 CURS X,1:PRINT "A B C"
00660 CURS X,3 PRINT "D E F"
00670 FOR L=1 TO 100 OUT 2,59:OUT 2,65:NEXT L
00680 PLAY 0,2,16,2:11,10,11,13,2,11,4,15,2,16,4
00690 LORES
00700 FOR L=1 TO 50
00710 SET INT(RND*127),INT(RND*47)
00720 NEXT L
00730 CLS:NORMAL
00740 IF C>H THEN LET H=C
00750 CURS 1,1:PRINT "SCORE="C;TAB 45;"HIGH SCORE="H
00760 CURS 10,8:PRINT "Hit 'Q' to quit,any other key to continue..."
00770 A1$=KEY IF A1$="" THEN 770
00780 IF A1$="Q" THEN CLS POKE 220,111 END
00790 CLS
00800 GOTO 300              :REM Start all over again...
```

TANDY TRS/80 SYSTEM 80

Obesity for TRS-80 & Sharp 1211

By Claude Colle, Ingham, QLD

Given your weight (in kg), your height (in cm), your sex (M/F) and a code number (1 or 2) for a medium or large frame respectively, it will tell you if you are obese and will calculate:

- the body fat percentage
- the body surface area in square metres
- the total body water in litres.

To run it, press SHIFT S and answer the questions.

```
10:"S"PAUSE "OB
   ESITY "
20:CLEAR :BEEP
   1:INPUT "YOU
   R WEIGHT ";W
   :"YOUR HEIGH
   T (IN CM) ";
   H,"YOUR SEX
   (M/F) ";S$
30:INPUT "CODE
   (1 OR 2) ";C
40:L=H/E2:I=W/L
   L
50:IF S$="M"
   THEN 110
60:IF C=1THEN 9
   0
70:IF I>29.5
   THEN 160
80:BEEP 3:PRINT
   "YOU ARE NOT
    OBESE":GOTO
   170
90:IF I>27THEN
   160
100:GOTO 80
110:IF C=1THEN 1
   40
120:IF I>29.9
   THEN 160
130:GOTO 80
140:IF I>27.5
   THEN 160
150:GOTO 80
160:BEEP 3:PRINT
   "YOU ARE OBE
   SE"
170:IF S$="M"LET
   F=1.281I-10.
   13:GOTO 190
180:F=1.48I-7
190:BEEP 3:PRINT
   "BODY FAT: "
   ;USING "###.
   ##";F;" %"
200:A=.007185*W^
   .425*H^.725
210:BEEP 3:PRINT
   "SURF.AREA:
   ";USING "##.
   ####";A;" SQ
   .M."
220:IF S$="M"LET
   B=.296785W+1
   9.4786L-14.0
   12934:GOTO 2
   40
230:B=.183809W+3
   4.4547L-35.2
   70121
240:BEEP 3:PRINT
   "BODY WATER:
    ";USING "##
   #.##";B;" L.
   ":GOTO 20

( 552 BYTES )
```

Fuddle for the TRS-80

By Kim Henkel, East Benleigh. VIC

Fuddle is a computer implementation of the game Boggle. Any number of people can play, as long as they can see the screen. The program generates a 4x4 matrix of random letters. The object is to make up as many words as possible using each letter only once. There is a time limit of 60 seconds kept by the computer. The person with the most words at the end of 60 seconds is the winner.

```
1 REM * * * * * * * * * * * * *
2 REM *      F U D D L E      *
3 REM *     KIM HENKEL 83     *
4 REM * * * * * * * * * * * * *
10 CLEAR500:DIML$(16),C(16)
20 CLS:GOSUB500
25 CLS:GOSUB200
30 PRINT@256,"";:FORT=1TO4:PRINTTAB(20);H$:
   PRINTTAB(20);B$:NEXT:PRINTTAB(20);VB$
100 FORP=1TO4:PRINT@337+6*P,L$(P);:NEXT
105 FORP=1TO4:PRINT@465+6*P,L$(P+4);:NEXT
110 FORP=1TO4:PRINT@593+6*P,L$(P+8);:NEXT
115 FORP=1TO4:PRINT@721+6*P,L$(P+12);:NEXT
130 FORT=60TO1STEP-1:PRINT@159,T;:FORTT=1TO210:NEXTTT:NEXT
135 CLS:PRINT@16,S$;:PRINT@24,T$;:PRINT@32,O$;:PRINT@40,P$;
190 PRINT@976,"DO YOU WISH TO PLAY ANOTHER GAME?";
191 Q=1009:A$=""
192 A$=INKEY$:IFA$()""THEN195ELSEPRINT@Q,CHR$(143);:
    FORT=1TO80:NEXTT:PRINT@Q,CHR$(128);:FORT=1TO40:NEXT:GOTO192
195 IF A$()"N"THEN25ELSEEND
200 REM * * * RANDOM LETTERS * * *
205 RANDOM
210 FORN=1TO16:L$(N)="":NEXT
215 FORN=1TO16
220 R=RND(26)
221 FORC=1TO16:IFC(C)=RTHEN220:NEXTELSENEXT
222 C(N)=R
230 L$(N)=CHR$(R+64)
240 NEXTN
250 RETURN
500 REM * * * STRING$ * * *
530 E$=CHR$(191)+STRING$(5,131):FORT=1TO4:H$=H$+E$:NEXT:
    H$=H$+CHR$(191)
535 E$=CHR$(191)+STRING$(5,128):FORT=1TO4:B$=B$+E$:NEXT:
    B$=B$+CHR$(191)
540 VB$=STRING$(25,131)
550 S$=CHR$(160)+CHR$(156)+STRING$(3,131)+CHR$(140)+CHR$(26)+
    STRING$(6,24)+CHR$(130)+CHR$(141)+STRING$(3,140)+CHR$(172)+
    CHR$(144)+CHR$(26)+STRING$(6,24)+CHR$(140)+STRING$(3,176)+
    CHR$(142)+CHR$(129)
555 T$=CHR$(130)+STRING$(2,131)+CHR$(191)+STRING$(2,131)+
    CHR$(129)+CHR$(26)+STRING$(4,24)+CHR$(191)+CHR$(26)+CHR$(24)
    +CHR$(191)
560 O$=CHR$(160)+CHR$(156)+STRING$(3,131)+CHR$(172)+CHR$(144)+
    CHR$(26)+STRING$(7,24)+CHR$(170)+CHR$(149)+STRING$(3,128)+
    CHR$(170)+CHR$(149)+CHR$(26)+STRING$(7,24)+CHR$(130)+
    CHR$(141)+STRING$(3,176)+CHR$(142)+CHR$(129)
565 P$=CHR$(170)+CHR$(151)+STRING$(3,131)+CHR$(171)+CHR$(148)+
```

```
    CHR$(26)+STRING$(7,24)+CHR$(170)+CHR$(157)+STRING$(3,140)+
    CHR$(142)+CHR$(129)+CHR$(26)+STRING$(7,24)+CHR$(170)+
    CHR$(149)
570 F$=CHR$(176)+STRING$(6,140)+CHR$(26)+STRING$(7,24)+CHR$(191)
    +CHR$(26)+CHR$(24)+CHR$(191)+STRING$(3,131)+CHR$(26)+
    STRING$(4,24)+CHR$(191)
575 U$=CHR$(191)+STRING$(4,128)+CHR$(191)+CHR$(26)+STRING$(6,24)
    +CHR$(131)+CHR$(140)+STRING$(2,176)+CHR$(140)+CHR$(131)
580 D$=CHR$(191)+CHR$(26)+CHR$(24)+CHR$(191)+CHR$(26)+
    STRING$(6,24)+CHR$(176)+CHR$(140)+STRING$(2,131)+CHR$(140)+

    CHR$(191)+CHR$(26)+STRING$(6,24)+CHR$(131)+CHR$(140)+
    STRING$(2,176)+CHR$(140)+CHR$(191)
584 NL$=CHR$(26)+CHR$(24)
585 L$=CHR$(191)+NL$+CHR$(191)+NL$+CHR$(191)+NL$+CHR$(191)
590 E$=CHR$(188)+STRING$(4,179)+CHR$(188)+CHR$(26)+STRING$(6,24)
    +CHR$(143)+STRING$(4,176)+CHR$(140)
595 FORT=1TO200:NEXTT:PRINT@325,F$;:GOSUB620:PRINT@462,U$;:
    GOSUB620:PRINT@349,D$;:GOSUB620:PRINT@359,D$;:GOSUB620:
    PRINT@366,L$;:GOSUB620:PRINT@500,E$;
600 PRINT@975,"PRESS ANY KEY TO BEGIN PLAY...";
610 A$=INKEY$:IFA$()""THENRETURNELSEPRINT@1005,CHR$(143);:FORT=1
    TO80:NEXTT:PRINT@1005,CHR$(128);:FORT=1TO40:NEXTT:GOTO610
620 FORT=1TO500:NEXTT:RETURN
```

Program Generator for TRS-80 Model1/111

By Craig Fisher, Hawker, ACT

PROGGEN is a program to make typing in programs from listings easy, quick and with fewer errors.

When you run the program you will be asked to type in two phrases (such as keywords not already included), which can be put into program lines by pressing just one button, the right arrow or the down arrow. Next you must type in the name of the program. After that PROGGEN will ask you if you want automatic line numbering or not. If the program you are going to type in has regular line numbers then type 'Y' or 'y', otherwise press ENTER.

If you use the line numbering you will next be asked for the first line number and then the line number increment. If the program starts at line 10 and goes up by 10s you can just press ENTER in answer to these questions. When you are ready to key in the program, press ENTER. The screen will then clear and you will see the basic keywords displayed in the top half of the screen next to the key you must press for them.

For the phrases you type in at the beginning you press the down arrow or the right arrow. Press the left arrow to backspace over characters. If you really mess up a line just press the CLEAR key and you can start it again. When you have finished typing in a line press ENTER; you will then be asked if there is another line to come. If there is, press ENTER, and you can then type in the next line. If there isn't or you don't want to do any more typing for the moment type 'N' or 'n'. When you type the rest of the program use a different name for it.

If an error occurs a message will appear at the bottom of the screen.

```
10  ' ****************************************
15  ' **********      PROGGEN      **********
20  ' ********** PROGRAM GENERATOR **********
30  ' **********     Copyright     **********
40  ' **********    April  1983    **********
50  ' ****************************************
60  ' ********** BY:  Craig Fisher **********
70  ' ****************************************
150 '
160 CLS
162 CLEAR1000
165 ONERRORGOTO350
170 DIMWD$(27)
180 AU=0:CX=0:Z=0:AN$="":ZZ=0:D1$="":PN$="":QU=0:LN=10:IN=10:N$=
""":LN$="":SK$=CHR$(10)+CHR$(9):IN$="":WW=0
190 FORZZ=0TO25:READWD$(ZZ):NEXT
210 PRINTTAB(19)"PROGGEN - Program Generator"
220 PRINT"    This program will enable you to type in keywords u
sing only two keys. This is done by typing a letter while holdin
g down    shift (with a lowercase driver).";
222 PRINT"It will also number the program lines unless they are
irregular. To erase the line you are  typ-ing press the clear ke
y. Two keys can be assigned any phrases,  these are the right an
d down";
230 PRINT" arrows. To get the phrases you havedesignated them ju
st press that key. Each line will be saved on disk as you enter
it."
240 PRINT:LINEINPUT"Programmable key phrases, No.1:";WD$(26):LIN
EINPUT"                          No.2:";WD$(27):LINEINPUT"Progra
m name:";PN$
245 INPUT"Automatic line numbering ";AN$:IFINSTR("Yy",LEFT$(AN$,
1))THENINPUT"First line No.";LN:INPUT"Increment";IN:ELSEAU=1
250 OPEN"O",1,PN$
260 LINEINPUT"Press enter when ready to type program ";AN$
265 CLS:PRINTSTRING$(64,140);:FORZZ=0TO27:PRINTCHR$(ZZ+65)" -=-
"WD$(ZZ),;:NEXT:POKE15840,94:PRINT@512,STRING$(64,131)
270 QU=0:PRINT@578,STRING$(LEN(LN$),32)" ":IFAU=0THENLN$=STR$(LN
)+"  "ELSELN$=""
280 PRINT@578,LN$
290 IN$=INKEY$:IFIN$=""THEN290  ELSEIFIN$=CHR$(8)THEN320  ELSEIF
IN$=CHR$(13)THEN330  ELSEIF(IN$)="A"ANDIN$(="Z"ANDQU=0)THENLN$=L
N$+WD$(ASC(IN$)-65)ELSEIFIN$=CHR$(31)THENGOTO270  ELSEIFINSTR(SK
$,IN$)THEN340  ELSELN$=LN$+IN$
300 IFIN$()CHR$(34)ANDIN$()"'"THEN310  ELSEIFQU=0THENQU=1ELSEIFQ
U=1THENQU=0
310 PRINT@578,LN$CHR$(143)+" ":GOTO290
320 IN$=RIGHT$(LN$,1):LN$=LEFT$(LN$,LEN(LN$)-1):GOTO300
330 PRINT@578,LN$"  ":PRINT##1,LN$:INPUT"Another line";AN$:IFLEN(
AN$)()0ANDINSTR("Nn",LEFT$(AN$,1))THENCLOSE:ENDELSELN=LN+IN:PRIN
T@578+LEN(LN$)," ";:GOTO270
340 IFIN$=CHR$(10)THENLN$=LN$+WD$(27):GOTO310  ELSELN$=LN$+WD$(2
6):GOTO310
350 IFERR=28THENPRINT@965,"Line too long.";:FORWW=0TO333:NEXT:PR
INT@965,STRING$(16,32);:RESUME310ELSEIFERR=8THENPRINT@965,"Past
line start.";:FORWW=0TO344:NEXT:PRINT@965,STRING$(16,32);:RESUME
310
352 IFERR=122THENPRINT@965,"No room on disk";:CLOSE:END
354 FORCX=960TO1017:PRINT@CX,"ERROR.";:FORZ=0TO9:NEXTZ:PRINT@CX,
"     ";:NEXTCX:CLOSE:END
355 REM  Keywords for each alphabetic character
360 DATA AND,GOTO,"CLS:",DATA,ELSE,FOR,GOSUB,CLEAR,INPUT,INKEY$,
INSTR(,LEFT$(,MID$(,NEXT,RND(,PRINT,SET(,RIGHT$(,STRING$(,THEN,C
HR$(,POKE,RESET(,READ,RETURN,PEEK(
```

Balloon Bomber for TRS-80 Models 1 & 111

By Graham Beland, Black Rock, VIC

This is a single-player game where you are in a balloon trying to bomb escaped prisoners. Your balloon was tied to the ground but the rope broke. You have no control over your craft, making it harder to aim.

You have 20 shots, which look like a lower case 'O'. The bombs drop straight down, but the cars at the bottom move very quickly. The space bar is used to drop a bomb. The game includes sound effects through the cassette port.

TRS/80 SYSTEM 80

```
1 CLEAR1000
2 CLS:GOSUB7000 CLS
10 REM- "Balloon Bomber" made by Graham N. Beland. For TRS-80                model I
& III. Finished in 13/8/82.
15 A$=" "+CHR$(176)+CHR$(140)+CHR$(140)+CHR$(131)+CHR$(131)+CHR$(131)+CHR$(140)+
CHR$(140)+CHR$(176)+" "
16 B$=" "+CHR$(150)+"          "+CHR$(169)+" "
17 C$=" "+CHR$(130)+CHR$(140)+CHR$(176)+CHR$(176)+"    "+CHR$(176)+CHR$(176)+CHR$
(140)+CHR$(129)+" "
18 D$="     "+CHR$(131)+CHR$(191)+CHR$(131)+" "
19 E$="     "+CHR$(183)+CHR$(191)+CHR$(187)+" "
20 BP=90
22 PRINT@960,STRING$(63,191);
25 GOSUB5000
40 R=RND(3):ON R GOTO 50,70,90
50 IFR=1THENBP=BP-1 IFBP<63THENBP=BP+2
70 IFR=3THENBP=BP+1 IFBP>114THENBP=BP-2
80 GOSUB1000
90 IFPEEK(14400)=128ANDKE=0THENKE=1 EE=9 DE=BP+325-64 AM=AM+1:GOSUB5000
100 IFKE=1THENGOSUB2000 IFAM=20ANDKE=0THENGOTO10000
110 IFSH=0THENGOSUB3000
120 GOSUB4000 'UPDATE THINGS POS.
130 GOTO40
1000 PRINT@BP,A$,:PRINT@BP+63,B$,:PRINT@BP+127,C$,:PRINT@BP+192,D$;:PRINT@BP+256
,E$;
1010 RETURN
2000 PRINT@DE," ";:DE=DE+64 IFDE=>1022THENDE=0:KE=0:PRINT@960,STRING$(63,191);:R
ETURN:ELSE:PRINT@DE,"o";:FORT=0TOEE:OUT255,2:OUT255,0:NEXT:EE=EE-1
2010 IFDE>=BL+1ANDDE<=BL+3THENPRINT@DE," ";:PRINT@BL,CHR$(RND(64)+128)+CHR$(RND(
64)+128)+CHR$(RND(64)+128)+CHR$(RND(64)+128)+CHR$(RND(64)+128)+CHR$(RND(64)+128)
;:FORT1=1TO5:FORT=1TO2:OUT255,2:OUT255,0:NEXTT,T1:DE=0:KE=0:KI=KI+1:GOSUB5000:RE
TURN:ELSERETURN
3000 BL=950:SH=1:SH$=CHR$(140)+CHR$(175)+CHR$(159)+CHR$(143)+CHR$(191)+CHR$(140)
+"  ":RETURN
4000 BL=BL-2:PRINT@BL,SH$;:IFBL<900THENPRINT@BL,"          ";:SH=0:RETURN:ELSE:R
ETURN
5000 PRINT@0,"You have bombed ";KI;" cars. You have ";20-AM;" shots left. ";:IFA
M>=21THENENDELSERETURN
7000 PRINT"                    BALLOON BOMBER"
7010 PRINT"                    ~~~~~~~~~~~~~~"
7020 PRINT"  This is a single Player Game where you are in a balloon which has r
ecently got out of control. Your mission is to destroy the"
7030 PRINT"escaped Prisoners, they have no hostages, so have no Pity."
7040 PRINT"You have 20 bombs- do the best you can."
7050 PRINT"     OR ELSE!"
7060 PRINT:PRINT"To drop a bomb Press the space bar."
7070 PRINT
7080 PRINT"This Program has sound so take your aux Plug and insert it intob
7090 PRINT"your 'aux in' on your radio."
7100 PRINT"  ~~~~~~~~~~~~~~~~~~~~~~~~~"
7110 PRINT"Press any key to begin."
7120 I$=INKEY$:IFI$=""THEN7120
7130 RETURN
10000 FORT=1TO500:NEXT:CLS:PRINT"Your bomb supply is exhausted."
10010 PRINT"Your score is ";KI
10040 INPUT"Press ENTER to start.";D$
10050 RUN
```

APPLE

Supermaze for Apple

By Martin Donnon, Rostrevor, SA

This program is the base of my adventure game, the maze. It makes use of the Apple's low-resolution graphics. The program can really be appreciated by Apple users who have colour. The program will pick one random colour for maze and take one from that number and draw the border in that colour.

The actual maze when run is quite complex but has one major flaw, running speed.

I added a storing device that stores the maze on the second hi-res page and can be accessed by a certain call or POKE. This feature should only be used with longer adventures.

```
10   REM *****SUPER-MAZE*****
20   REM            *BY*
30   REM ***MARTIN   DONNON***
40   HOME
50   DEF  FN R(Z) =  INT ( RND (Z)
       * 40):C =  INT ( RND (1) *
      15) + 1
60   VTAB 23: HTAB 13: INVERSE : PRINT
      "GENERATING MAZE": NORMAL
70   GR
80   COLOR= C: FOR Z = 0 TO 39
90   HLIN 0,39 AT Z
100   NEXT :X = 1:Y = 1
```

APPLE

```
110   COLOR= C - 1: HLIN 0,39 AT 0
      : HLIN 0,39 AT 39: VLIN 0,39
       AT 0: VLIN 0,39 AT 39
120   COLOR= 0
130   GOSUB 340:Q = 0: FOR Z = 1 TO
      4: IF H(Z) = 0 THEN Q = Q +
      1
140   NEXT : IF Q > Z THEN  GOSUB
      350
150   ON  INT ( RND (1) * 6) + 1 GOTO
      180,220,260,300,220,300
160 M = M + 1: IF M < 900 THEN 13
      0
170   GOTO 400
180 F =  FN R(1): IF Y - F < 2 THEN
      130
190   FOR Z = Y - 1 TO Y - F STEP
       - 1: IF  SCRN( X - 1,Z) = 0
       OR  SCRN( X + 1,Z) = 0 THEN
      380
200   NEXT
210   VLIN Y,Y - F AT X:Y = Y - F:
       GOTO 360
220 F =  FN R(1): IF X + F > 37 THEN
      130
230   FOR Z = X + 1 TO X + F: IF  SCRN(
      Z,Y - 1) = 0 OR  SCRN( Z,Y +
      1) = 0 THEN 380
240   NEXT
250   HLIN X,X + F AT Y:X = X + F:
       GOTO 360
260 F =  FN R(1): IF F + Y > 38 THEN
      130
270   FOR Z = Y + 1 TO Y + F: IF  SCRN(
      X - 1,Z) = 0 OR  SCRN( X + 1
      ,Z) = 0 THEN 380
280   NEXT
290   VLIN Y,Y + F AT X:Y = Y + F:
       GOTO 360
300 F =  FN R(1): IF X - F < 2 THEN
      130
310   FOR Z = X - 1 TO X - F STEP
       - 1: IF  SCRN( Z,Y - 1) = 0
       OR  SCRN( Z,Y + 1) = 0 THEN
      380
320   NEXT
330   HLIN X,X - F AT Y:X = X - F:
       GOTO 360
340 H(1) =  SCRN( X,Y - 1):H(2) =
      SCRN( X + 1,Y):H(3) =  SCRN(
      X,Y + 1):H(4) =  SCRN( X - 1
      ,Y): RETURN
350 X =  INT ( RND (1) * 35) + 2:
      Y =  INT ( RND (1) * 35) + 2
      : PLOT X,Y: RETURN
360 T = 0: GOTO 160
370   GOTO 130
380 T = T + 1: IF T > 10 THEN T =
      0: GOSUB 350
```

```
390  GOTO 130
400  VTAB (22): PRINT  TAB( 14)"S
     TORING MAZE": FOR Z = 0 TO 1
     024:X =  PEEK (1024 + Z): POKE
     16432 + Z,X: NEXT
410  END
```

Graphing Straight Lines for the Apple 11

By V. Zalakos, Galston, NSW

This program was written to illustrate the graphic capabilities of the Apple II+ personal computer.

The program demonstrates straight lines graphed on a pair of axes of variable division length.

When commencing the program the computer requests the user to supply this information: gradient of line; Y-intercept of the line; and the division spacing that the user would like on the axes.

The graphics page is then swapped for the text and plotting commences.

At the completion of graphing the user is asked if he wishes to continue. If he does he is then asked if he wishes to clear the screen. If he does an HGR command is executed and the cycle is then repeated. If however he does not wish to clear the screen the cycle is just repeated.

The program may be simply changed to plot parabolas (or any other curve for that matter). For parabolas change these lines:

1040 PRINT "PLOTTING CURVES IN THE FORM Y=AX 2 + BX + C" 1050 PRINT:PRINT

1060 INPUT "VALUE FOR A ";A

1070 INPUT "VALUE FOR B ";B

1075 INPUT "VALUE FOR C ";C

1110 K=B : RB=C # S

1280/1360 Y=(A # X # X) = (B # X) +C

HINT: Use small values for A, B and C for best results, for example 0.004

If you find you have a favourite graph you would like to save, the procedure is quite simple (if you have a disk drive for your Apple).

i) BOOT DOS

ii) RUN GRAPHS (or whatever you called your programs)

iii) DELETE the lines 1410-1470 (these ask if you wish to continue)

iv) RUN the program using the co-ordinates for the particular graph.

v) Once the program has stopped type NEW

vi) You should have the graph on the screen with no program in memory

vii) now type BSAVE<filename>,A8192,L8192

viii) When the drive has ceased activity type TEXT

ix) Type CATALOG

x) You should have a file:

B 032 MY FAVOURITE GRAPH

To view your file you must put the Apple into the HGR mode.

i) Now type BLOAD filename

ii) You should now see your graph on the screen.

```
1   REM *************************
2   REM *  GRAPHING UTILITY FOR  *
3   REM *       THE APPLE II     *
4   REM *  WRITTEN BY V.ZALAKOS  *
5   REM *************************
10   HOME
20   PRINT "DO YOU WANT INSTRUCTIONS ";
30   GET A$: IF A$ = "N" THEN 1000
40   HOME
50   PRINT  SPC( 14);"INSTRUCTIONS": PRINT
60   PRINT "THE PROGRAM IS DESIGNED TO GRAPH  "
70   PRINT  SPC( 10);"STRAIGHT LINES."
80   PRINT : PRINT
90   PRINT "THE COMPUTER WILL ASK FOR FOUR PIECES OF"
100  PRINT "INFORMATION:"
110  PRINT  SPC( 12);"(1) THE GRADIENT OF THE LINE"
120  PRINT  SPC( 12);"(2) THE Y-INTECEPT"
125  PRINT
130  PRINT  SPC( 12);"(3) THE DIVISIONAL SPACING"
135  PRINT : PRINT
140  PRINT "THE COMPUTER WILL THEN SET ABOUT":
     PRINT  SPC( 9);"PLOTTING YOUR GRAPH"
150  VTAB (23): PRINT "HIT ANY KEY..."
200  WAIT ( - 16384),128
1000  CLEAR
1010 XX = 79:XY = 81:YX = 139:YY = 141
1020  HOME : HGR : TEXT : HOME
1030  HOME : TEXT : HOME
1040  PRINT "GRAPHING STRAIGHT LINES IN THE FORM":
      PRINT  SPC( 15);"Y=MX+B"
1050  PRINT : PRINT
1060  INPUT "WHAT IS THE GRADIENT (M) ";M
1070  INPUT "WHAT IS THE Y-INTERCEPT (B) ";B
1080  IF V = 2 THEN 1110
1090  INPUT "WHAT SPACING DO YOU WANT ON THE AXES ";S
1100  PRINT "DO YOU WANT EACH DIVISION TO BE 1 UNIT  OR ";
      S;" UNITS APART ";: INPUT P: IF P = S THEN RB = B:
      GOTO 1120
1110 RB = B * S
1120  POKE  - 16304,0: POKE  - 16297,0
1130 :
1140  REM **SET AXIS COLOURS***
1150 :
1160  HCOLOR= 3
1170  IF V = 2 THEN 1190
1180  GOSUB 1510
1190  HOME : VTAB 22: PRINT "THE GRAPH IS Y=";M;"X+";B
1200 :
1210  REM **PRINT EQUATION**
1220 :
1230  HCOLOR= 1
1240 :
1250  REM **PLOT FIRST POINT**
1260 :
1270  FOR X =  - 140 TO 139
1280 Y = M * X + RB
1290  IF 80 - Y < 0 OR 80 - Y > 159 THEN 1310
1300  HPLOT X + 140,80 - Y:X = 0: GOTO 1350
1310  NEXT X
1320 :
1330  REM **PLOT REST OF POINTS     USING HPLOT TO**
1340 :
1350  FOR X =  - 140 TO 139
1360 Y = M * X + RB
1370  IF 80 - Y < 0 OR 80 - Y > 159 THEN 1390
1380  HPLOT  TO X + 140,80 - Y
1390  NEXT X:
1400  POKE  - 16300,0
1410  VTAB 24: PRINT "ANOTHER GRAPH ";: GET A$
1420  PRINT
1430  IF A$ = "N" THEN 1470
1440  PRINT "CLEAR THE SCREEN ";: GET A$
1450  IF A$ = "N" THEN V = 2: GOTO 1030
1460 V = 0: HOME : HGR : HOME : GOTO 1030
1470  HOME : TEXT : HOME : END
1480 :
1490  REM **PLOT Y-AXIS**
1500 :
1510  HPLOT 0,80 TO 279,80
1520 :
1530  REM **PLOT Y-AXIS**
1540 :
1550  HPLOT 140,0 TO 140,159
1560 :
1570  REM **PLOT 'X'**
1580 :
1590  HPLOT 144,2 TO 148,7 TO 152,2
1600 :
1610  REM  **PLOT 'Y'**
1620 :
1630  HPLOT 148,7 TO 148,12
1640  HPLOT 269,85 TO 277,95: HPLOT 269,95 TO 277,85
1650 S =  ABS (S)
1660 XS = 0:F = 0
1670  FOR AA = 140 TO 279 STEP S
1680  IF AA > 279 OR AA < 0 THEN 1800
1690  HPLOT AA,XX TO AA,XY
1700 AB = AA - 2 * XS * S
1710  HPLOT AB,XX TO AB,XY
1720  IF F = 2 THEN 1780
1730 AC = AA - 60
1740  IF AC < 0 OR AC > 159 THEN F = 2: GOTO 1780
1750  HPLOT YX,AC TO YY,AC
1760 AD = AC - 2 * XS * S
1770  HPLOT YX,AD TO YY,AD
1780 XS = XS + 1
1790  IF AA < 279 - S THEN  NEXT AAELSE550
1800  GOTO 1190
```

File Length & Address for Apple 11

By Robert Chalmers, Inala, QLD

The program is designed to allow the ADDRESS and LENGTH of a binary file to be found, without having to load the file into memory and then PEEKING at $AA60/61 and $AA72/3 to get the length and start.

The program will first READ the DATA and POKE it into memory. While this is happening, to keep you entertained, a pretty pattern of dots will appear on the VDU.

The first request is for SLOT, the second is DRIVE. You are then asked for the name of the BINARY file. When this is input, a press of RETURN will begin the operation, and a moment later the ADDRESS and LENGTH of the file will be displayed in DECIMAL, with the HEX equivalent underneath it.

```
]LIST

100  REM  **************************
110 :
120  REM      READS ADDRESS AND
130  REM      LENGTH OF BINARY
140  REM          FILES.
150 :
160  REM  **************************
170  DEF  FN V(D) =  PEEK (D) + 256 *  PEEK (D + 1)
180  HIMEM: 16384: TEXT : HOME : NORMAL
190  HTAB 10: VTAB 1: FLASH : PRINT " JUST A MOMENT   ": NORMAL : FOR X = 0 TO 5
75: READ D1: POKE 16384 + X,D1: PRINT " . ";:
     NEXT : HOME
200  PRINT "---------------------------------"
210  VTAB 2: HTAB 6: PRINT "BINARY FILE ADDRESS AND LENGTH."
220  PRINT "---------------------------------"
230  INVERSE : VTAB 6: INPUT "SLOT ?";S$:S =  VAL (S$)
240  VTAB 6: HTAB 10: INPUT "DRIVE ?";D$:D =  VAL (D$): NORMAL
250  VTAB 8: PRINT "PLEASE TYPE IN THE BINARY FILE NAME,AND"
260  PRINT "PRESS RETURN TO END INPUT."
270  INPUT "NAME ?";N$
280  POKE 0,S: POKE 1,D: CALL 16384
290 AD =  FN V( FN V(4)):LE =  FN V( FN V(4) + 2)
300  IF AD = 65535 THEN  VTAB 12: CALL  - 958: PRINT  CHR$ (7)">"N$"< IS NOT A B
INARY FILE.": GOTO 270
310  IF LE = 65535 THEN  VTAB 12: CALL  - 958: PRINT  CHR$ (7)"I CANNOT READ THI
S DISK..SORRY !": GOTO 270
320  IF  NOT (LE OR AD) THEN  VTAB (12): CALL  - 958: PRINT  CHR$ (7)">"N$"< IS
NOT ON THIS DISK.": GOTO 270
330  VTAB 10: INVERSE : PRINT "FILE NAME:";: NORMAL : PRINT " ";N$
340  VTAB 12: INVERSE : PRINT "ADDRESS:";: NORMAL : PRINT " ";AD;: PRINT  TAB( 2
0): INVERSE : PRINT "LENGTH:";: NORMAL : PRINT
     " ";LE
350  VTAB 13: HTAB 9: PRINT "$";: PRINT  TAB( 27)"$"
360 N =  INT (AD):VT = 13:HT = 10: GOSUB 380:N =  INT (LE):VT = 13:HT = 28: GOSU
B 380
370  GOTO 460
380 HI =  INT (N / 256):LO = N - HI * 256:H1 =  INT (HI / 16):H2 = HI - H1 * 16:
L1 =  INT (LO / 16):L2 = LO - L1 * 16
390 X = H1: GOSUB 440
400 X = H2: GOSUB 440
410 X = L1: GOSUB 440
420 X = L2: GOSUB 440
430  RETURN
440  IF X < 10 THEN  VTAB (VT): HTAB (HT): PRINT X;:HT = HT + 1: RETURN
450 X = X + 55: HTAB (HT): PRINT  CHR$ (X);:HT = HT + 1: RETURN
460  VTAB 22: HTAB 1: PRINT "TO READ ANOTHER FILE,INPUT IT'S NAME.  "
470  INPUT ">RETURN< TO END:";N$: IF N$ = "" THEN  END
480  HOME : CALL 16384: GOTO 290
490  END
500  DATA  76,32,65,0,0,1,255,255,0,17,15,255,255,255,255,0,0,1,0,0,96,1,0,1,239
,216,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
     0,0,0,0
510  DATA  0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
     0,0,0,0
520  DATA  0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
     0,0,0,0
530  DATA  0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
     0,0,0,0
540  DATA  0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,169,
     5,133,2
550  DATA  169,64,133,3,169,26,133,4,169,64,133,5,165,0,10,10,10,10,160,1,145,2,
160,15,145,2,165,1,200,145,2,160,2,145,2,24,1
     65,2,105,17
560  DATA  160,6,145,2,165,3,105,0,200,145,2,165,4,200,145,2,234,234,234,234,234
,165,5,200,145,2,162,0,189,0,2,240,12,9,128,1
     57,0,3,232
570  DATA  224,31,208,241,240,10,169,160,157,0,3,232,224,31,208,246,169,17,160,4
,145,2,169,0,200,145,2,165,2,164,2,32,217,3,1
     44,3,76,50
580  DATA  66,160,2,177,4,72,136,17,4,208,9,104,160,3,145,4,136,16,251,96,177,4,
160,4,145,2,104,200,145,2,165,3,164,2,32,217,
     3,144,3
590  DATA  76,50,66,169,11,72,162,30,24,105,32,160,177,4,221,255,2,208,8,136,202
```

APPLE

```
,208,245,104,76,228,65,104,24,105,[illegible],208,228,
    76,154,65
600 DATA  24,72,165,2,168,177,4,41,15,201,4,240,11,169,255,160,0,145,4,200,145,
4,104,96,104,168,177,4,72,200,177,4,160,5,145
    ,2,104,136
610 DATA  145,2,165,3,164,2,[illegible]217,3,144,[illegible],76,50,66,160,[illegible],177,4,72,200,177,4,1
60,5,145,2,104,136,145,2,168,[illegible],164,2,32,217,[illegible]
    ,176,1,96
620 DATA  169,255,160,[illegible],145,4,136,145,4,96,0,0,0,0,0
```

SHARP & TANDY PCs

Menstruation Forecast and Contraception for the Sharp PC

By Claude Colle, Ingham, VIC

This program will forecast the date of the next menstruation cycle and, given a date within a cycle, will tell whether conception is possible or not likely.

It is supposed that no conception is possible 12 days or less before the next expected menstruation date (Ogino method).

First input the last 11 menstruation dates using label 'D'. Save this data using label 'S' (make sure tape is ready in cassette).

Then whenever you want to use the program, load it and use label 'L' to load the data. Enter the new date using label 'N'. This is done to update the data, since the forecast is related to the average of the last 10 differences of the menstruation dates. Label 'F' will show you the forecast and label 'C' is used for contraception.

Warning: Since this program is based on the Ogino method it is not 100 per cent safe to use as a contraception method.

```
10:"D"PAUSE "DA
   TA":CLEAR :A
   =365.25:B=30
   .6001
20:FOR I=1TO 10
30:BEEP 1:INPUT
   "DATE ";D,"M
   ONTH ";M,"YE
   AR ";Y:USING
   :PRINT D;"/"
   ;M;"/";Y
40:IF M<3LET Y=
   Y-1:M=M+12
50:M=M+1
60:IF Z=1THEN 8
   0
70:C=INT (A*Y)+
   INT (B*M)+D:Z
   =1:GOTO 90
80:E=INT (A*Y)+
   INT (B*M)+D:Z
   =0
90:IF E=0THEN 3
   0
100:F=ABS (E-C):
   G=G+F:H=G/I:
   L=H+.05
110:BEEP 3:USING
   "###.#":
   PRINT "MEAN=
    ";L:NEXT I:
   IF M>12LET M
   =M-12:Y=Y+1
120:"S"BEEP 3:
   PRINT "SAVE
   DATA ON TAPE
   "
130:PRINT #"DATA
   ":END
140:"L"PRINT "LO
   AD DATA FROM
    TAPE"
150:BEEP 1:INPUT
   #"DATA":END
210:"N"PRINT "EN
   TER NEW DATE
   ":PRINT " "
220:BEEP 1:INPUT
   "DATE ";D,"M
   ONTH ";M,"YE
   AR ";Y:USING
   :PRINT D;"/"
   ;M;"/";Y
230:IF M<3LET Y=
   Y-1:M=M+12
240:M=M+1
250:IF Z=1THEN 2
   70
260:C=INT (A*Y)+
   INT (B*M)+D:Z
   =1:J=C:GOTO
   280
270:E=INT (A*Y)+
   INT (B*M)+D:Z
   =0:J=E
280:I=I+1:F=ABS
   (E-C):G=G+F:
   H=G/I:L=H+.0
   5
290:BEEP 3:USING
   "###.#":
   PRINT "MEAN=
    ";L:GOTO "S
   "
300:"F"PRINT "FO
   RECAST":M=M-
   1:IF M>12LET
   M=M-12:Y=Y+1
310:BEEP 1:USING
   :PRINT D;"/"
   ;M;"/";Y:J=J
   +H
320:Y=INT ((J-12
   2.1)/A):K=
   INT (YA):M=
   INT ((J-K)/B
   )
330:D=INT (J-K)-
   INT (MB)
340:IF M>=14LET
   M=M-12
350:M=M-1
360:IF M<3LET Y=
   Y+1
370:GOTO 310
400:"C"PRINT "CO
   NTRACEPTION"
410:BEEP 1:INPUT
   "DATE ";R,"M
   ONTH ";S,"YE
   AR ";T:PRINT
   " ":PRINT R;
   "/";S;"/";T;
   ":"
420:IF S<3LET T=
   T-1:S=S+12
430:S=S+1
440:Q=INT (AT)+
   INT (BS)+R:
   IF Z=1LET P=
   C:GOTO 460
450:P=E
460:Q=Q-P
470:IF Q<5THEN 5
   00
480:IF Q>=(INT H
   -12)THEN 510
490:BEEP 3:PRINT
   "CONCEPTION
   POSSIBLE.":
   GOTO 410
500:BEEP 3:PRINT
   "MENSTRUATIO
   N DAY":GOTO
   410
510:BEEP 3:PRINT
   "CONCEPTION
   NOT  LIKELY.
   ":GOTO 410
```

(1083 BYTES)

SAMPLE RUN

```
27./8./1982.
20./9./1982.
MEAN=  24.0
16./10./1982.
MEAN=  25.0
10./11./1982.
MEAN=  25.0
5./12./1982.
MEAN=  25.0
30./12./1982.
MEAN=  25.0
25./1./1983.
MEAN=  25.2
20./2./1983.
MEAN=  25.3
17./3./1983.
MEAN=  25.3
12./4./1983.
MEAN=  25.3
9./5./1983.
MEAN=  25.5

SAVE DATA ON TAP
E

ENTER NEW DATE

2./6./1983.
MEAN=  25.4
SAVE DATA ON TAP
E

FORECAST

2./6./1983.
27./6./1983.
22./7./1983.
17./8./1983.
11./9./1983.

CONTRACEPTION


6./6./1983.:
MENSTRUATION DAY

7./6./1983.:
CONCEPTION POSSI
BLE.

14./6./1983.:
CONCEPTION POSSI
BLE.

15./6./1983.:
CONCEPTION NOT
LIKELY.

26./6./1983.:
CONCEPTION NOT
LIKELY.
```

Dashboard Computer for the Sharp PC

By Claude Colle, Ingham, VIC

This program can be used when you undertake a long trip. With the Pocket Computer it is

very useful since you can carry it with you in the car.

At the end of your trip you will know the distance travelled, the duration of the trip (including stops), the stopping time, the driving time, the average speed in km/h, the quantity of petrol used in litres, the average consumption of petrol in litres per 100 km, the total cost of petrol and the average cost of petrol in dollars per 100 km.

Pressing SHFT D to start, enter the destination (T$ and U$ are used if the name of the town has more than seven characters), the date (N$ and Y$ if more than seven characters), the departure time in h/m/s, the odometer reading in km.

During the trip, every time you stop, using SHFT S, enter the time when you stopped in h/m/s, the quantity of petrol (if you put any in) in litres, the amount you paid for petrol, the departure time.

At the end of your trip, fill the tank and press SHFT A to enter the time of arrival, the odometer reading, the quantity of petrol needed to fill the tank, the amount you paid for petrol.

If the printer is connected and ON, you will get all the answers printed. If you have no printer, press ENTER after each display to obtain the results.

Bon Voyage!

```
    DASHBOARD
    COMPUTER

10:"D"PAUSE "DA
   SHBOARD COMP
   UTER":CLEAR
12:PRINT "T R I
    P    T O     "
   :PRINT " "
14:BEEP 1:INPUT
   "DESTINATION
    ";T$,U$:
   PRINT T$;U$:
   PRINT " "
16:BEEP 1:INPUT
   "DATE ";N$,Y
   $:PRINT "DAT
   E : ";N$;Y$
20:BEEP 1:INPUT
   "DEPARTURE T
   IME: ";D,"CO
   UNTER READIN
   G: ";K
30:D=DEG D:END
40:"S"PAUSE "ST
   OPS":BEEP 1
50:INPUT "STOP
   TIME: ";E,"P
   ETROL: ";P,"
   PETROL COST:
    ";A,"START
   TIME: ";F
60:E=DEG E:F=
   DEG F:Q=Q+P:
   B=B+A
70:C=F-E:G=G+C:
   END
80:"A"BEEP 1:
   INPUT "TIME
   OF ARRIVAL:
   ";H,"COUNTER
    READING: ";
   L,"PETROL: "
   ;P,"COST: ";
   A
85:Q=Q+P:B=B+A:
   I=H-D:J=I-G:
   M=L-K
90:S=M/J:O=Q/M*
   100:R=B/M*10
   0
100:BEEP 3:USING
   :PRINT "DIST
   ANCE: ":
   PRINT M;" KM
   "
110:PRINT "TRIP
   TIME: ":
   PRINT I;" HR
   S"
120:PRINT "STOPS
    TIME: ":
   PRINT G;" HR
   S"
130:PRINT "DRIVI
   NG TIME: ":
   PRINT J;" HR
   S"
140:USING "####.
   #":PRINT "AV
   . SPEED: ":
   PRINT S;" KM
   /H"
150:PRINT "PETRO
   L USED: ":
   PRINT Q;" L.
   "
160:PRINT "AV. C
   ONSUMPTION:"
   ;O;" L./100K
   M"
170:USING "####.
   ##":PRINT "P
   ETROL COST:
   ":PRINT "$";
   B
180:PRINT "AV. C
   OST:":PRINT
   "$";R;"/100
   KM"
190:END

   (741 BYTES)

 T R I P   T O
   MOUNT-ISA

DATE : 5/10/1982
DISTANCE:
1033. KM
TRIP TIME:
11. HRS
STOPS TIME:
0.5 HRS
DRIVING TIME:
10.5 HRS
AV. SPEED:
  98.3 KM/H
PETROL USED:
 124.0 L.
AV. CONSUMPTION:
   12.0 L./100
PETROL COST:
$  59.36
AV. COST:
$   5.74/100 KM
```

VIC 20

Alien for Vic-20

By S. Jones, Holder, ACT

The object of the game is to stop the falling aliens from landing. The top scorer's name and score can be put on line 1. The program contains simple colour graphics and sound.

```
1 TS$="S.JONES":TS=550
5 POKE36879,238
10 PRINT"J";
15 PRINTTAB(5)"■■■■■ ALIEN ■■■■■"
20 PRINT:PRINT:PRINT:PRINT"WRITTEN BY SIMON JONES":FORI=1TO3000:NEXTI
25 PRINT"DO YOU REQUIRE        INSTRUCTIONS (Y OR N) ?"
30 GETA$:IFA$=""THEN30
35 IFA$="Y"THEN45
40 GOTO75
45 PRINT"J";:PRINTTAB(5)"■■■■■ ALIEN ■■■■■":PRINT:PRINT:
46 PRINT"YOUR   MISSION  IS  TODESTROY  THE  INVADING";
50 PRINT"ALIENS  THAT FALL FROMTHE   SKY. THE    MOREALIENS ";
55 PRINT" YOU    DESTROYTHE FASTER ";
60 PRINT"THEY FALL.":PRINT:PRINT"THE ■■ KEY  MOVES  YOULEFT, ";
65 PRINT" THE ■■ KEY MOVESYOU     RIGHT. ";
70 PRINT"   THE■SPACE BAR■ FIRES."
75 PRINT:PRINT"LEVEL OF DIFFICULTY   (0-9)":INPUTD
76 PRINT"TOP SCORE-":PRINTTS$,TS
80 PRINT:PRINT"HIT ANY KEY TO START  GAME":POKE198,0:WAIT198,1:POKE198,0
85 S=0:V=15:E=1
90 PRINT"J";:PRINTCHR$(142);:PRINT"SCORE:":V=36878:S1=36876:S2=36877:POKEV,15
95 FORI=1TO22:POKE8163+I,102:POKEQ,5:NEXTI
100 SC1=8153:AL1=7702+INT(RND(1)*22)
105 POKESC1,32:POKE30720+SC1,0:POKEAL1,32:POKE30720+AL1,0:POKEV,15
110 POKES1,199
115 B=INT(RND(1)*4):IFB=1THENAL1=AL1+1
120 IFB=2THENAL1=AL1-1:IFAL1<7680THENAL1=7680
125 IFB>2THENAL1=AL1+23
130 IFAL1>8141THENGOTO165
135 C=PEEK(197):IFC=45THENSC1=SC1-1:IFSC1<8142THENSC1=8142
140 IFC=22THENSC1=SC1+1:IFSC1>8163THENSC=8163
145 IFC=32THEN210
150 POKESC1,30:POKESC1+30720,0:POKEAL1,81:POKEAL1+30720,0
155 FORJ=1TO10*(D-E):NEXTJ
160 POKES1,0:GOTO105
165 POKE198,0:PRINT"J";:PRINT"THE ALIENS HAVE LANDED"
170 POKEV,0:POKES1,0:POKES2,0
175 PRINT:PRINT"YOUR SCORE WAS ";S
180 IFTS<STHENPRINT:PRINT"YOU GOT TODAY'S TOP   SCORE":TS=S:PRINT:INPUT"NAME";TS
$
185 PRINT:PRINT"DO YOU WANT TO PLAY   AGAIN (Y OR N) ?"
190 GETB$:IFB$=""THEN190
195 IFB$="N"THEN240
200 IFB$="Y"THEN75
205 GOTO190
210 L=SC1-22:POKES1,238
212 POKESC1,30:POKESC1+30720,0:POKEAL1,81:POKEAL1+30720,0
215 L=L-22:IFL<7680THENPOKES1,0:GOTO105
220 IFL=AL1THENPOKEL,42:POKE30720+AL1,2:POKES1,0:S=S+10:PRINT"■",TAB(6);S:POKES2
,220:GOTO230
225 GOTO215
230 FORI=15TOSSTEP-1:POKEV,I:FORY=1TO250:NEXT:NEXT:POKES2,0:POKEL,32:POKES1,0:PO
KESC1,32
235 E=INT(S/50):GOTO108
240 END

READY.
```

Shoot-em-up for Vic-20

By Mark Wilkinson, Somerville VIC

THIS PROGRAM is an arcade game written for the unexpanded VIC-20 with standard Atari-type joystick.

VIC 20

After the program is typed in it should be saved before running, as it contains machine code routines and any error in these routines will cause the computer to crash. At the start of each game you must enter a skill level (1 to 9). After that you have four launchers with which to destroy as many aliens as possible, gaining ten points per alien destroyed.

```
 1Ø POKE 56,28:POKE 52,28:CLR
 2Ø GOSUB 9ØØ
 4Ø X=X+DX:IF X<Ø OR X>21 THEN X=X-DX
 5Ø POKE S+X,4:POKE C+X,7
 6Ø IF RND(1)>SK THEN GOSUB 2ØØ
 69 POKE Ø,Ø
 7Ø SYS 828:SYS 7432:SYS 7461
 71 Q=PEEK(Ø):IF Q>Ø THEN POKE 36877,168:SC=SC+1Ø*Q
 75 IF PEEK(S+X)<>4 THEN 3ØØ
 8Ø DX=Ø:IF(PEEK(P)AND16)=ØTHEN DX=-1
 84 POKE Ø,Ø
 85 SYS 75Ø2:SYS 828:SYS 75Ø2
 86 Q=PEEK(Ø):IF Q>ØTHEN POKE 36877,168:SC=SC+1Ø*Q
 9Ø IF (PEEK(P1)AND128)=ØTHEN DX=1
 94 POKE 36877,Ø:POKE 36874,Ø
 95 IF (PEEK(P)AND32)>ØTHEN Z=Ø
 96 IF (PEEK(P)AND32)=ØAND Z=Ø THEN POKE S+X-22,3:POKE C+X-22,3
    :Z=1:POKE 36877,2ØØ
 97 IF DX<>Ø THEN POKE 36874,2ØØ
 99 PRINT "(HOME)(DWN)(RVS)(YEL)"SC,HT
1ØØ POKE S+X,32:SYS 75Ø2:GOTO 4Ø
2ØØ R=INT(RND(1)*9)+1:IF PEEK(9ØØ+R)=ØTHEN POKE 9ØØ+R,1
21Ø RETURN
3ØØ POKE 36877,138:POKE 36874,Ø
31Ø FOR J=255 TO 8 STEP-1:POKE 36879,J:NEXT
32Ø POKE 36877,Ø
33Ø HT=HT+1:IF HT=4THEN 35Ø
34Ø GOSUB 967:GOTO 4Ø
35Ø INPUT "(CLR)(DWN)(DWN)(DWN)(RGT)(RGT)(RGT)(RVS)ANOTHER GAME"
    ;A$:IF A$="N"THEN SYS 64818
36Ø PRINT "(CLR)";:RUN
9ØØ FOR J=828 TO 886:READA:POKEJ,A:NEXT
91Ø FOR J=7432 TO 7585:READA:POKEJ,A:NEXT
94Ø FOR J=91Ø TO 968:READA:POKEJ,A:NEXT
95Ø FOR J=7424 TO 7431:POKEJ,Ø:NEXT:POKE 36869,255:POKE 36879,8
    :POKE 36878,15
96Ø FOR J=7168 TO 7231:READA:POKEJ,A:NEXT
964 POKE 1,22:POKE 3,22:POKE 2,3Ø:POKE 4,15Ø
965 S=8142:C=38862:P=37137:P1=37152
966 INPUT "(CLR)(RVS)(DWN)(RGT)(YEL)SKILL LEVEL";SK:SK=SK/1Ø
967 PRINT "(CLR)(RVS)(CYN)SCORE","HITS"
968 PRINT "(DWN)"TAB(19)"(YEL)EF":FOR J=Ø TO 21:POKE 8164+J,7
    :POKE 38884+J,4:NEXT
969 FOR J=9ØØ TO 9Ø9:POKE J,Ø:NEXT
97Ø POKE 37139,Ø:POKE 37154,127:RETURN
1ØØØ DATA 162,9,188,132,3,24Ø,34,185,142,3,168,177,1,2Ø1,1,24Ø,28,
      169,32,145,1
1Ø1Ø DATA 254,132,3,188,132,3,185,142,3,24Ø,19,168,169,Ø,145,1,169
      ,5,145,3,2Ø2
1Ø2Ø DATA 2Ø8,214,96,169,32,23Ø,Ø,145,1,169,Ø,157,132,3,24,144,238
1Ø3Ø DATA 162,22,189,7,31,24Ø,4,2Ø2,2Ø8,248,96,173,4,144,41,3,2Ø8,
      245,169,2
1Ø4Ø DATA 157,29,31,157,29,151,24,144,234
1Ø5Ø DATA 162,176,189,29,31,2Ø1,2,24Ø,8,2Ø1,1,24Ø,2Ø,2Ø2,2Ø8,242,
      96,169,32,157,29
1Ø6Ø DATA 31,169,2,157,51,31,157,51,151,24,144,236,169,32,157,29,
      31,24,144,22Ø
1Ø7Ø DATA 162,Ø,189,Ø,3Ø,2Ø1,3,24Ø,13,189,242,3Ø,2Ø1,3,24Ø,29,232
      ,224,242,2Ø8,237
1Ø75 DATA 96,169,32,157,Ø,3Ø,189,234,29,2Ø1,32,2Ø8,34,169,3,157,
      234,29,157,234,149
1Ø8Ø DATA 24,144,213,169,32,157,242,3Ø,189,22Ø,3Ø,2Ø1,32,2Ø8,19
      ,169,3,157,22Ø,3Ø
1Ø85 DATA 157,22Ø,15Ø,24,144,19Ø,169,1,157,234,29,24,144,182,169
      ,1,157,22Ø,3Ø,24,144,174
112Ø DATA 41,4Ø,39,38,37,58,79,1ØØ,99,98,97,74,73,94,116,139,14Ø
      ,119,97,75
113Ø DATA 53,3Ø,29,5Ø,71,93,115,136,157,178,199,221,244,245,246
      ,247,248,249,25Ø
114Ø DATA 251,23Ø,2Ø9,21Ø,232,254,255,234,213,19Ø,167,146,125,
      126,127,1Ø6,1Ø7,86,64,Ø
115Ø DATA 6Ø,126,153,255,255,9Ø,129,66,52,129,254,255,255,127,
      254,117
116Ø DATA 16,24,8,16,24,8,16,16,16,24,8,16,24,8,16,16
117Ø DATA 24,24,6Ø,126,126,255,255,255,31,63,127,2Ø1,255,127,
      63,7
118Ø DATA 248,252,254,147,255,254,252,224,65,219,255,255,255,
      255,255,255
```

Programmable Character Maker for the Sorcerer

By Peter Fallon, Castle Hill, NSW

THIS PROGRAM is an aid for making programmable characters. By drawing the character for the program, it can tell you the data required to use it in a program as well as show you what the final character looks like.

Programmable characters on the Sorcerer are made up of an 8 by 8 dot array. Each of the eight horizontal rows is recorded as eight bits (or one byte) in memory. Therefore each dot is controlled by a bit in memory and can be plotted on and off by setting it to 0 or 1.

The program sets up the array and, starting at the top left corner, requires you to say if you want a dot on or off. A flashing cursor marks the dot in question. If you make a mistake you can restart a horizontal line (press R) or restart the whole shape (press P). Note that for both of these, your character up to that point remains on the screen for reference.

The routine can be used where most GET A$ commands are used in programs for the Apple, Pet, VIC-20 and so on, so it should be useful for conversion of programs between systems.

Note:

1) A key is only indicated as pressed if pressed while the routine is running (line 140 shows the way of waiting for a keystroke).

2) If you hold a key down, program execution halts until you release it.

```
1 REM Programmable Character Generator Program
2 REM Written by Peter Fallon
5 REM Data for Keyboard scan routine
10 DATA 205,21,224,194,250,223
20 DATA 205,9,224,50,255,0,201
30 FOR Z = 240 TO 252 : READ A : POKE Z,A : NEXT
35 FOR Z = -512 TO -505 :POKE Z,255 : NEXT
40 DIM A(8) :POKE 255,0
45 FOR Z = 1 TO 8 : A(Z)=0 : NEXT :IF PEEK(255)=80 THEN 180
50 PRINT CHR$(12);"Programmable Character Maker"
60 FOR Z = 1 TO 28 : PRINT"-"; : NEXT : PRINT
70 PRINT TAB(20);"by Peter Fallon"
80 PRINT : PRINT : PRINT"The character is made up of 64 dots,"
90 PRINT : PRINT"arranged in an 8*8 matrix."
100 PRINT : PRINT"For each dot you must tell me"
110 PRINT : PRINT"if you want it to be on (Y) or off (N)."
120 PRINT : PRINT"Hit a key to start"
130 POKE 260,240 ; POKE 261,0 : Z=USR(0)
140 IF PEEK(255)=0 THEN 130
150 PRINT CHR$(12) : A=192
160 FOR Z = 0 TO 7 : POKE Z-3391,45 : NEXT
170 FOR Z = 0 TO 7 : POKE Z*64-3328,151 : NEXT
171 PRINT"Plot it? (Y/N)"
172 PRINT : PRINT"Press R to restart a line."
173 PRINT : PRINT"Press P to pack it in and start the shape over."
180 FOR W = 0 TO 7
190 FOR Z = 0 to 7
210 IF A=32 THEN A=192 : GOTO 230
220 A=32
230 POKE Z+W*64-3328,A
240 POKE 260,240 : POKE 261,0 : B=USR(0)
250 IF PEEK(255)=89 THEN A=192 : A(W+1)=A(W+1)+2^(8-Z) : GOTO 280
260 IF PEEK(255)=78 THEN A=32 : GOTO 280
263 IF PEEK(255)=82 THEN A(W+1)=0 : GOTO 190
265 IF PEEK(255)=80 THEN 45
270 GOTO 210
280 POKE Z+W*64-3328,A
285 NEXT : NEXT
290 PRINT : INPUT"Is this the character you want (Y/N)";A$
300 IF LEFT$(A$,1)="N" THEN 150
310 PRINT CHR$(12)
330 PRINT"The data for this shape is :"
340 FOR Z = 1 TO 8
350 PRINT A(Z);" "; : POKE Z-505,A(Z) : NEXT
360 PRINT : PRINT"and it appears thus :";CHR$(193)
370 PRINT : INPUT"Do you want to make another (Y/N)";A$
380 IF LEFT$(A$,1)="Y" THEN 45
390 END
```

SORCERER

SIGMA/OKI

Ski for Sigma-Oki IF800

By Tony Hinde, Tarragidi, QLD

Ski is a game to test your ability to make decisions in the heat of the moment. You must have a crisp wit and a fiery disposition.

The object of the game is to ski down a thin path between the trees of a burning pine forest. You will die immediately if you hit a tree or enter the fire. You will be permitted to fry again, if you wish.

The screen is set in 40 character mode to increase the speed. There is also a difficulty rating which controls the pine tree density of the forest. Movement is controlled by the arrow keys.

SIGMA/OKI

```
10 COLOR 2,6 : WIDTH 40 : CLS : T=TIME
20 DEF CHR$ (182)="24A5663C3C242424"
30 INPUT "level of difficulty 'hard 1 to easy 5' ";E : E=E+1 : IF E>6 THEN E=6 E
LSE IF E<2 THEN E=1.5
40 X=16:A=19
50 H=INT(RND*2+.5)-1
60 X=X+H : IF X>31 THEN X=31
70 IF X<1 THEN X=1
80 R=INT(RND*2+.5)-1
90 LOCATE 0,24,0 : PRINT STRING$ (X,193);
100 COLOR 4,7 : PRINT STRING$ (8+R,32);
110 COLOR 2,6 : PRINT STRING$(32-X-R,193);
120 COLOR 4,7
130 J=INT(RND(-7*R)*.5)+1
140 LOCATE X-1+J,23,0 : PRINT CHR$(128); : IF RND*E <1 THEN 130
150 LOCATE 24,0,0
160 K$=INKEY$ : IF K$="" THEN 180 ELSE K=ASC(K$) : IF K<28 OR K>29 THEN 180
170 IF K=28 THEN A=A+1 ELSE A=A-1
180 IF A<1 THEN A=1 ELSE IF A>39 THEN A=39
190 COLOR 4,7 : S=SCREEN (A-1,1) : IF S<>32 THEN 230
200 COLOR 2,6 : S=SCREEN (A-1,1) : IF S<>32 THEN 230
210 COLOR 1,7 : LOCATE A-1,0,0 : PRINT CHR$(182); : COLOR 2,6
220 GOTO 50
230 COLOR 4,0 : T=TIME-T-11
240 PLAY "T8004L16N8P16L18N3P4N3L8N5N3P8L8N7N8"
250 CLS : IF S = 128 THEN PRINT " You had a collision with a tree, after "; : GO
TO 270
260 IF S=193 THEN PRINT " You were consumed by fire, after ";
270 IF T>59 THEN PRINT INT(T/60);" minutes and "; T-INT(T/60)*60; " seconds " EL
SE PRINT T; " seconds "
280 PRINT " would You like to ski again "
290 K$=INKEY$ : IF K$="" THEN 290 ELSE K=ASC(K$)
300 IF K$="y" OR K$="Y" THEN 10
310 IF K$="n" OR K$="N" THEN CLS : END ELSE GOTO 290
```

VZ200

Graphic Sine Waves for VZ200.

By Dean Nickasen, Murrumbeena, VIC

This program will draw sine-waves in the graphic symbols of the VZ200. Lines 10 to 90 input the values for the sinewave. Lines 100 to 200 plot the graph. The purpose of line 210 is to keep the computer in the graphics mode.

To modify the program for other computers, lines 100 to 200 will have to be changed. Instead of setting points, a PRINT TAB(Z) statement will work. The program will also work on the VZ200 in this manner.

```
10 REM GRAPHIC SINE WAVES
20 REM BY DEAN NICLASEN
30 REM SEPTEMBER 1983
40 CLS
50 PRINT" ENTER THE LOWEST LIMIT FOR X";:INPUT A
60 PRINT
70 PRINT" ENTER THE UPPER LIMIT FOR X";:INPUT B
80 PRINT
90 PRINT ENTER EXPANSION AND SHIFT";:INPUT E,S
100 MODE(1)
110 FOR X=A TO B STEP(B-A)/80
120 Y=2*COS(4*X-.349)+3*SIN(3*X+1.309)
130 Z=E*Y+S
140 IF Z>127 OR G>63 THEN 210
150 COLOR 3,0
160 SET(S+40,G)
170 COLOR 2,0
180 SET(Z+40,G)
190 G=G+1
200 NEXT X
210 GOTO 210
```

CBM/4016

Pet Screen Grid for CBM 4016

By Peter Bungay, Wagga Wagga, NSW

CBM/4016

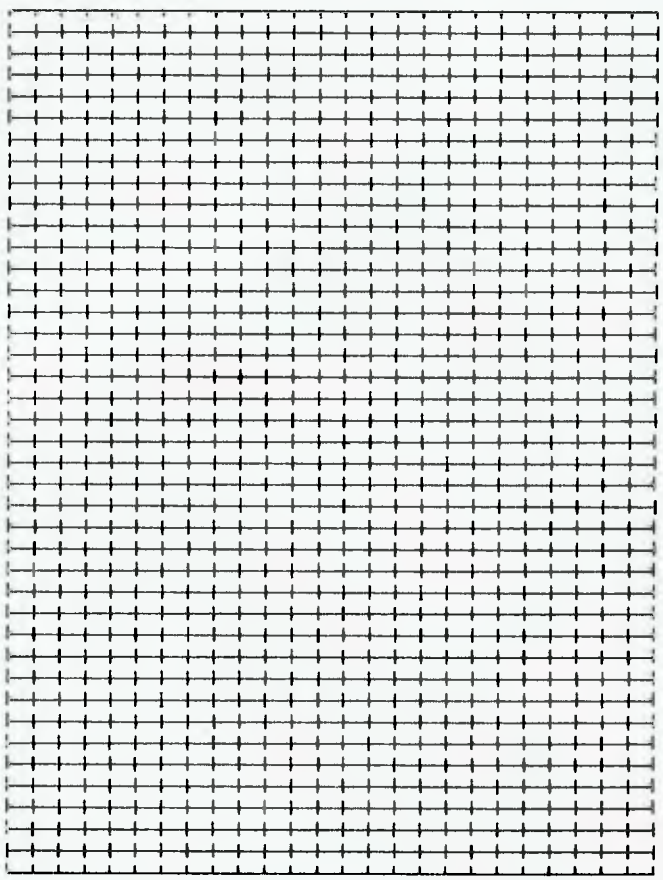
This is a short routine that will produce a 40 x 25 grid to aid in the setting out of screen layout.

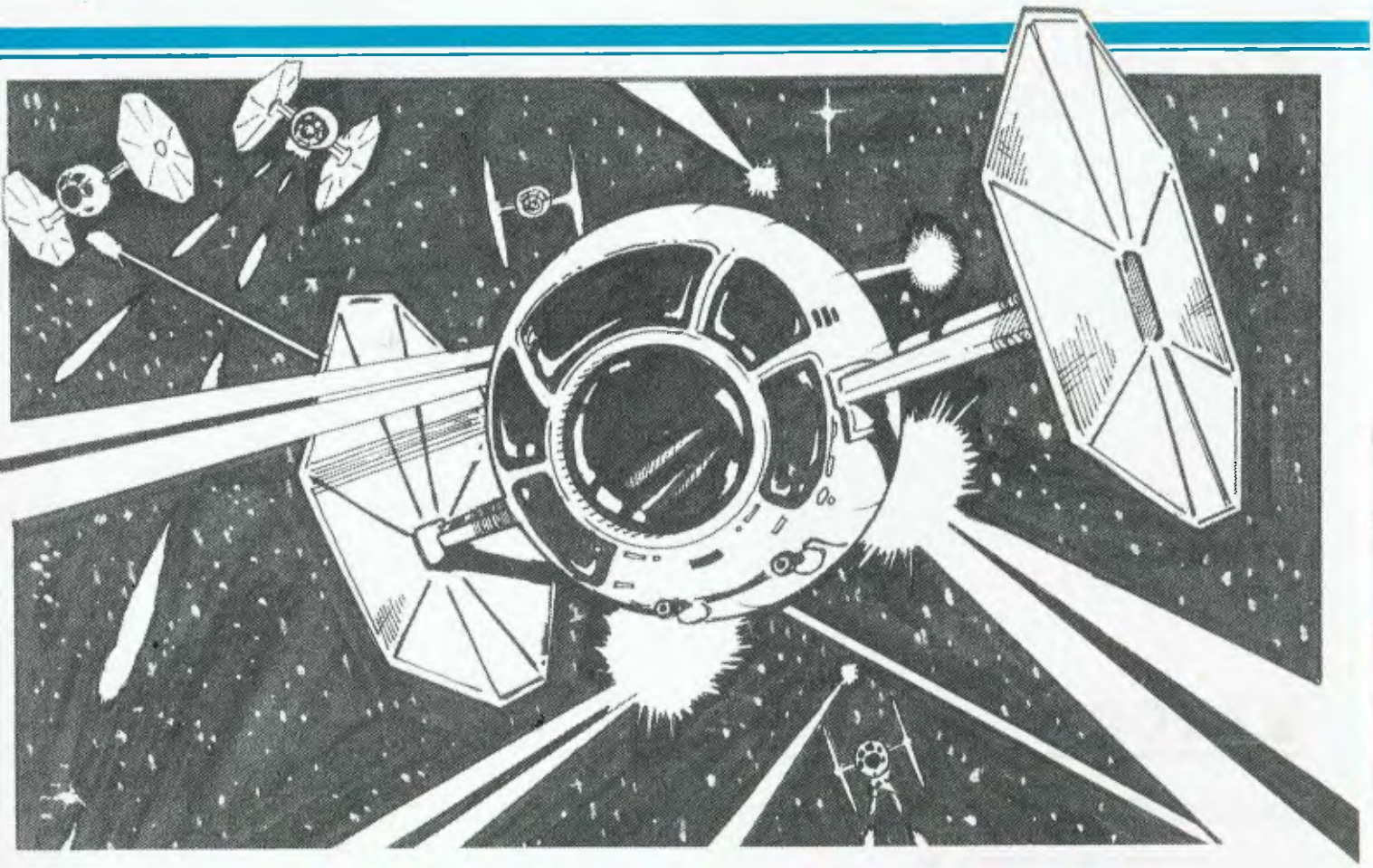
By using the grid sheet you can see how instructions will look on the screen and then decide whether to use TAB or cursor rights and how many cursor downs to include in the programme without the usual trial and error.

To increase the number of copies adjust lines 180-190, and to move the grid further up or down the sheet, change the value in line 290.

The programme was written on a CBM4016 and printed with a 4022P printer.

```
100 REM ...PET SCREEN GRID...
110 REM ...PETER BUNGAY 13 NOV 83...
120 PRINT"■"
130 PRINTTAB(11)"■ ■PET SCREEN GRID■ ■"
140 PRINT"■■■■THIS PROGRAMME WILL PRINT A 40 X 25"
150 PRINT"■■■GRID THAT WILL AID IN SETTING UP YOUR"
160 PRINT"■■■SCREEN OUTPUT."
170 INPUT"■■■HOW MANY COPIES REQUIRED";C
180 IFC<=5THEN220
190 IFC>5THENPRINT"■■■■ARE YOU SURE? PAPER IS SCARCE!"
200 PRINT"■■■KEEP IT LESS THAN 5"
210 INPUT"■■■HOW ABOUT CHANGING IT";C
220 PRINT"■■■■■■■■CONTINUE - ■Y■ OR ■N■"
230 GETC$:IFC$<>"Y"ANDC$<>"N"THEN230
240 IFC$="Y"THEN260
250 IFC$="N"THENPRINT"■":END
260 OPEN1,4
270 FORT=1TOC
280 PRINT#1,CHR$(147)
290 FORP=1TO3:PRINT#1:NEXTP
300 PRINT#1
310 PRINT#1,TAB(10)"┌";:FORA=1TO24:PRINT#1,"─";:PRINT#1,"┬";:NEXTA
320 PRINT#1,"─";:PRINT#1,"┐"
330 PRINT
340 FORB=1TO39
350 PRINT#1,TAB(10)"├";
360 FORC=1TO24:PRINT#1,"─";:PRINT#1,"┼";:NEXTC
370 PRINT#1,"─";:PRINT#1,"┤"
380 NEXTB
390 PRINT#1,TAB(10)"└";:FORD=1TO24:PRINT#1,"─";:PRINT#1,"┴";:NEXTD
400 PRINT#1,"─";:PRINT#1,"┘"
410 PRINT#1,CHR$(19)
420 NEXTT
430 CLOSE1
READY.
```





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Disassembler For The Microbee

Mytek Computing has released a disassembler for the Microbee. Marketed under the name BEEZ80, this program is available from Mytek in Western Australia for $20. Mike Newnham reviewed it for us.

THE PROGRAM LOADs from BASIC and when it executes, the user is treated to a pixel-by-pixel generation of the Mytek logo. The screen is then initialised with the introduction to the program. This reveals another name for this piece of software; BEEZ80 unmasked appears to be a Microbee version of ZAP80, which was released some years ago for the Exidy Sorcerer.

BEEZ80 is designed to run on a BASIC-only Microbee; you do not need to have EDASM fitted.

The main selling point of this program is that it will disassemble the so-called 'hidden codes'. These codes are a group of about seven hundred code combinations that were never documented by Zilog. Some of them can be executed by the Z-80, but they are of little real value to serious users. While the Z-80 will apparently execute about 100 of these codes, not all Z-80s will execute them in the same manner. This is due to differences between the various makes and models of the Z-80 chip itself. Therefore, if you write software using these code combinations, it may not run on all other Microbees, and it is not advisable to try to market software using these codes.

Consider that to disassemble 'hidden codes' they must already exist as an operational piece of software, or a contrived list. I am not aware of any Z-80 assembler that supports mnemonics for these 'illegal' codes. Naturally they can be created using DEFine Byte or DEFine Word instructions, and if they execute on *your* machine, that is the only thing you can be sure of.

The main reasons for the omission of these codes from the Z-80 instruction set are that their function may be altered by chip differences, the operation that they perform is of very limited use and that, if really needed, most of them are easily derived from the standard instructions.

Will They Run On Your Bee?

Ultimately, it is up to the individual to determine which codes will run on his or her machine. It is first necessary to generate a table of all the 'hidden' sequences. Next you must disassemble them to establish the operation they can be expected to perform. You then have to test each combination to ensure it performs the operation its mnemonic suggests.

While checking operation, it is also necessary that the flags be monitored to determine any effects on them. I generated some of the hidden codes which have the DD, FD and ED prefixes. The majority of these codes operate in the same manner as some of the legal codes, but they use more memory to do it. For example, the legal instruction 43'H' will cause the contents of the E register to be placed in the B register. The 'hidden code' DD 43 does the same thing.

While the DD prefix provides for operations using the IX register and the FD prefix acts on the IY register, two 'hidden codes', FD 25 and FD 2C, disassembled as DEC HX and DEC LX respectively. In other words, two IY codes disassembled as IX operations. I don't know if there are any other anomalies of this nature -- someone else can have some fun.

The remainder of the 'hidden codes' appear to deal with operations involving the upper and lower halves of the IX and IY registers.

The rest of the program is quite straightforward. Six options are available to the user. These are presented as prompts, to which you respond on a yes/no basis. Two of these make the output readable as it progresses, either by slowing the output or by displaying one screen of information at a time.

One optional feature allows output to be directed to a printer. I have an Epson printer set up for serial data transfer; try as I might it would not print when I selected the printer option. I don't have a parallel interface cable and I didn't want to pull my printer apart, so I didn't attempt to determine whether it would work in parallel mode. I assume Mytek have decided that a user of this program ▶

will also be using the parallel interface for the printer.

Another feature is the option of having a linefeed occur after a jump or RET instruction — handy for separating subroutines, or other functional blocks, from surrounding code. 'Hidden code' disassembly will only take place if the user selects this as an option.

The other feature available, again as an option, is the ability to have the data within memory displayed as ASCII. This is useful for finding text storage areas. The output format in this mode takes the form of a row of sixteen bytes of data, preceded by the address of the first byte. The ASCII equivalent (if valid) for each of these values is printed underneath it.

If the data does not represent a valid ASCII code, then a question mark is printed. Unless you have a printer available, it is only possible to view 80 bytes of data and their ASCII equivalents at a time. While the Screen Wait option displays fifteen lines of output at a time, in ASCII mode each row of memory data takes up three screen lines for the data and its equivalents, and a linefeed to separate each group from the next. Thus, only the last five sets of data remain on-screen.

When the user has selected the options required for the disassembly, the program requests the start and finish addresses of the block of memory to be disassembled. The user is then confronted with 'ANY MORE (Y/N/C)'. A 'yes' response will generate a prompt for more addresses; the options will remain as selected. If 'no' then the program executes a WARM START. Re-entry to BEEZ80 is via the EXEC command in BASIC. If you respond with 'C', then BEEZ80 is initialised to enable the selection of new options.

Though not mentioned in the documentation accompanying the program, use of the BREAK key will allow exit from a disassembly, and the ESC key will create a COLD START.

Limitations

The program does have its limitations, and from some points of view they are very restrictive. BEEZ80 is a single-pass disassembler which does not generate a source (mnemonic) file for later re-assembly. To serious assembly language programmers, this is the greatest limitation.

Second, BEEZ80 does not generate labels during disassembly. Labels are devices which are used primarily to identify instructions which are accessed via either subroutine calls or direct or relative jumps in a program. In assembly language programming, labels are virtually obligatory. In a disassembler, which will generate a source file for re-assembly, they are again essential. Even in a disassembler which does not produce a source file, labels still make the task of threading your way through a long listing less tedious.

Sometimes it is necessary to move code to another area of memory before it can be disassembled. This is the case if the disassembler itself occupies all or part of the RAM used by the program to be disassembled. The disassembler must then be provided with an offset, which is the difference between the normal resident address of the first instructions of the program and the address it now occupies for the purposes of disassembly. This offset will enable the disassembler to generate true addresses in the address field for the listing. Where the disassembler prints the destination address of relative jumps, this offset is again required to create the true address. BEEZ80 does not provide this feature, and it must be remembered when disassembling relocated code.

This program is not a powerful software tool and is best suited to those programmers who really only want to dig into machine code routines to see how they operate, or to those who want to investigate the behaviour of the hidden codes. ❑

System Expansion
Part 2

The When And How Of Adding Things On

In the first part of this article Roy Hill considered the relative merits of both serial and parallel data transmission. He follows it up this issue with his views on the S100 bus.

I DELIBERATELY did not mention S100 in the first part of this article. My reason for not talking about it is simple – I think it's a disaster. For a start, who needs 100 problems, when ten are usually enough to give us all the ulcers we need? For a second consideration, who needs uni-directional data lines, when most computers provide for bi-directional lines? Thirdly, who needs clock lines running right beside power lines with all the spikes and glitches one could ever wish to avoid?

I have a recurrent nightmare in which an evil wizard (note – I did not say Sorcerer) condemns me to convert all my nice, simple serial and parallel lines to an S100 bus. Just the thought is enough to make me consider early retirement! Yes, I know S100 is a standard, but I also know of plenty of rotten standards.

Consider the humble RS232 interface of 25 pins. Most of us know that RS232 is designed for serial transmission, which as I mentioned in Part 1 only requires a maximum of seven lines (if we also include a Data Set Ready (DSR) and Data Carrier Ready (DCR) line), so why does the RS232 connector have 25 pins? Well, the answer is both simple and complicated!

In trying to create a standard that will last for more than three weeks, the designers have attempted to provide for additional lines that may be required in the future. Of the 25 pins available, two are 'reserved', three are unassigned, and at least another five are secondary lines which are unlikely ever to be used for anything standard. So they become used by computer manufacturers – for such things as cassette interfaces, modems and so on, which usually leads to problems of compatibility when trying to tie equipment from different manufacturers together.

How Many Lines?

Just how many lines are really needed for interfacing? Well, for a serial interface we have already decided that a maximum of seven lines is needed for our purposes, and ten lines for a simple parallel output. For those who wish to investigate serial and parallel I/O in more depth, I thoroughly recommend the series of articles by Steve Leibson in the February-July 1982 issues of *BYTE* magazine, titled 'The Input/Output Primer'.

For a more complex system expansion, such as extra RAM or ROM, many more lines are needed. Consider a simple expansion of our 'Microvic' from its 4K to, say, 16K. We need a line for our power supply and a line for ground. We need 16 lines for our address bus and eight for the bi-directional data bus. We need a line for each of the phase 1 and phase 2 clocks, but not next to the power supply lines. Finally, we need a Read/Write line. This makes a *minimum* total of 27 lines for a RAM or ROM expansion. If we allow an extra ten lines (for heaven knows what), we still only need 37 lines, which can easily be accomplished using an S22/44 connector, or a Eurocard connector. Thirty-seven lines is not quite 100.

The time has now come for us expansionists to make an important decision. Are we going to keep our trusty cassettes, or are we going to take the big plunge and invest in disks? I have been using two cassette recorders on my SYM-1 computer for over three years now, and I've never really had any major problems with them. My only difficulty is that occasionally I have to adjust the value of the input capacitor, and then everything is fine again. However, I must remember that I read cassettes at 1500 Baud, and I can understand those Kansas City babes wishing their 300 Baud systems to hell.

Before we discuss the relative merits of disk systems, though, let us assume that our domestic finance manager has just broken into peals of laughter at our timid suggestion that $1400 would be well spent on a double disk drive, and that we have retired, sulking, from the field of combat.

What can we do to expand our system, without having first to search for a suit of armour or a spouse-proof force field. First, we must be able to hop inside the machine, armed with a suitable circuit diagram and plenty of determination. It is at this stage that I must resort to personal experience. My SYM-1 computer is one of the kind that sits up and begs you to fiddle. So, with the help of an electronic genius friend of mine, this is how I went about expanding my SYM, following his lead.

Expanding With Care

The SYM is a 6502-based machine, with the provision for 4K of on-board RAM, approximately 65 I/O lines (depending on how they are used), and four 24-pin sockets, whose addresses can be altered to a small extent to suit individual requirements. This is done by removing and/or installing wire links in a small jumper area in the centre of the SYM board. The addresses available at this area are all those from $8000 to $ffff, in 2K increments. Thus this area can be used for tying the correct address lines to each of the four 24-pin sockets previously mentioned. These sockets can then be used for the installation of ROMs or EPROMs, according to the wishes of the owner.

The first socket of the four is already filled when the SYM is bought. This socket contains the 4K Supermon ROM,

which is a very powerful monitor routine. The routines provided allow the user to display and alter the contents of specified RAM locations, to block move data within the RAM area, to verify and obtain a checksum of any area of ROM or RAM and to fill a specified section of RAM with a selected pair of hex characters. The routines mentioned are only a few of the many available in this 4K chip, but will serve to illustrate its uses. Of course, the chip also controls the normal POR (power on reset) initialisation, as well all I/O routines and cassette I/O.

What makes this chip of even more use to the SYM owner is the fact that Synertek supplies a *complete* assembly listing of the contents of this ROM, together with comments and a table of the more useful routines and their addresses within the ROM. This listing has been invaluable to *all* SYM users for two reasons:

1. It allows them to write their own packages (for whatever purpose) and still be able to use those routines which are available in Supermon.
2. It gives an excellent example to the novice programmer of how the experts make the 6502 stand on its head.

For those enthusiasts who examined the assembly listing I included in the last article, it will be noticed that although the printer driver intercepted and modified the normal I/O path, the normal terminal output routine (TOUT) was still used to send the character to the CRT.

The 4K Supermon is tied to the $80 and $88 address lines (that is, 2 x 2K).

My next acquisition was the 8K BASIC ROM. This BASIC is a Synertek version of standard Microsoft, and was available in either two 4K ROMs or one 8K ROM. As they were both the same price, it wasn't hard to figure that the 8K ROM was a far better investment; it only requires one socket on the board, instead of two.

The BASIC is fairly standard, with one notable exception – there are no intrinsic trigonometric functions. Synertek has got around this problem to some extent by providing them as a machine language patch, but it must be typed in, saved on cassette, and then loaded in whenever trig functions are required. There is a much better way around this problem, as I will show later.

I was quite happy having only 4K of RAM at this stage, as it takes a while to become familiar with the features of a chip such as this. Besides, at the time I was becoming far more interested in assembly language programming, and had my eyes on the Synertek Resident Assembler-Editor chip. Once again, this is an 8K chip, available as two 4K or one 8K chip. As before, I opted for the single-chip version, even though this time it was almost twice the price of the 2 x 4K version. This meant that three of the four available sockets were now filled with a total of 20K of ROM. BASIC is located at the 8K block from $c000 to $dfff, and the Resident Assembler-Editor (RAE for short) is located in two separate 4K blocks: from $b000 to $bfff and from $e000 to $efff.

At this stage, my electronic-whiz friend, who also has a SYM, presented me with an EPROM programmer written in RAE format, and with his version of a POR program. He also provided me with the object code of these two programs nicely located on a TMS2516 EPROM (a 2K EPROM). This was located at $f000 to $f7ff.

The EPROM programmer was brilliant. It could program any of the 2K and 4K EPROMs and even had a routine to program the new 8K EPROMs from Motorola – the 68764. These chips still have only 24 pins (unlike their Texas and Intel counterparts), and still fit very nicely into the 24-pin sockets on the SYM board.

Because my system differs slightly from my friend's (I have heard it said that no two SYMs ever look the same), I modified the POR program slightly to suit my system. The pair of us also added extra RAM capacity in the form of a 32K Beta Board. This was in addition to the 4K RAM already on-board. The 4K of on-board RAM is 2114 static RAM, and the Beta Board 4116 dynamic RAM.

For those who are unaware of the difference, static RAM uses a transistor-type flip-flop. The contents of a given memory cell (or bit) will not change unless written to – in other words, the contents must be actively altered by the user. Dynamic RAM, on the other hand, retains its memory by means of capacitive effect. Because capacitors leak, the dynamic RAM would develop amnesia unless it was periodically 'refreshed'. This refreshing process is carried out so as not to interfere with the normal reading or writing.

However, dynamic RAM requires a special controller and on-board power supply generator, which increase the chip count of the board and thus the cost. Because dynamic RAM can have up to four times the density (four times the memory capacity) of static RAM, however, it still usually works out to be a cheaper form of memory expansion.

Both these systems look as though they will shortly be replaced with a third. Although CMOS RAM needs a bigger package than static or dynamic (24 pins as against 16 pins), it has the advantage of the low power drain of dynamic RAM coupled with the 'flip-flop' convenience of static RAM. CMOS RAM is also very tolerant of power variations and is a unipolar supply. This means that CMOS RAM can have back-up power supplied by a NiCad battery, which is trickle-charged whenever the computer is being used. This also means that CMOS RAM has the potential to retain the contents of its memory even when the power is switched off. I notice Applied Technology have chosen this system for their Microbee.

CMOS RAM is also becoming cheaper by the minute; at my last pricing, the cost of 2K CMOS chips was $8. If the cost drops much further, computer fanatics will at last have a real choice to make. Will I buy disks, or will I add extra RAM?

Fooling Your Computer

This now brings me to the main point of this article. In the first section I mentioned that the total addressable memory of any machine with a 16-bit address line is 64K bits. I also mentioned that there is a way in which we can 'fool' our computer into thinking it has more RAM/ROM than its 64K. The technique used for accomplishing this is known as 'Bank Switching', in which RAM/ROM is switched into and out of the same memory address space.

Some store-bought computers already have this facility built in, in the form of a memory management unit, which looks after the complex task of switching. Owners of such units as the 'Microvic' should be able to accomplish the same task if they have access to a memory map and circuit diagram of their machine, and can program in the assembly language for their particular microprocessor. The latter is vital, because high-level languages such as BASIC and FORTRAN are far to slow to implement bank switching.

The whole secret of bank switching lies in the chip used for I/O purposes. This is usually called the PIA or VIA or PIO. Regardless of what it is called, its purpose is usually fairly standard: to provide the user with one or more 8-bit parallel ports and one or more control lines.

The particular I/O chip I wish to consider is the 6522 VIA. This device is a 40-pin I/O chip with two 8-bit parallel I/O ports, two 16-bit programmable timers/counters, a serial data port driven by a shift register and four separate control lines. These are normally used for handshaking, but can be used (subject to some restrictions) for I/O. A diagram of ▶

Features

- Two 8-Bit Bidirectional I/O Ports
- Two 16-Bit Programmable Timer/Counters
- Serial Data Port
- Single +5V Power Supply
- TTL Compatible
- CMOS Compatible Peripheral Port A Lines
- Expanded "Handshake" Capability Allows Positive Control of Data Transfers Between Processor and Peripheral Devices
- Latched Output and Input Registers
- 1 MHz Operation
- Operation over wide temperature range (-40°C to +85°C)

Description

The SYE6522 Versatile Interface Adapter (VIA) is a very flexible I/O control device. In addition, this device contains a pair of very powerful 16-bit interval timers, a serial-to-parallel/parallel-to-serial shift register and input data latching on the peripheral ports. Expanded handshaking capability allows control of bi-directional data transfers between VIA's in multiple processor systems.

Control of peripheral devices is handled primarily through two 8-bit bi-directional ports. Each line can be programmed as either an input or an output. Several peripheral I/O lines can be controlled directly from the interval timers for generating programmable frequency square waves or for counting externally generated pulses. To facilitate control of the many powerful features of this chip, an interrupt flag register, an interrupt enable register and a pair of function control registers are provided.

Block Diagram

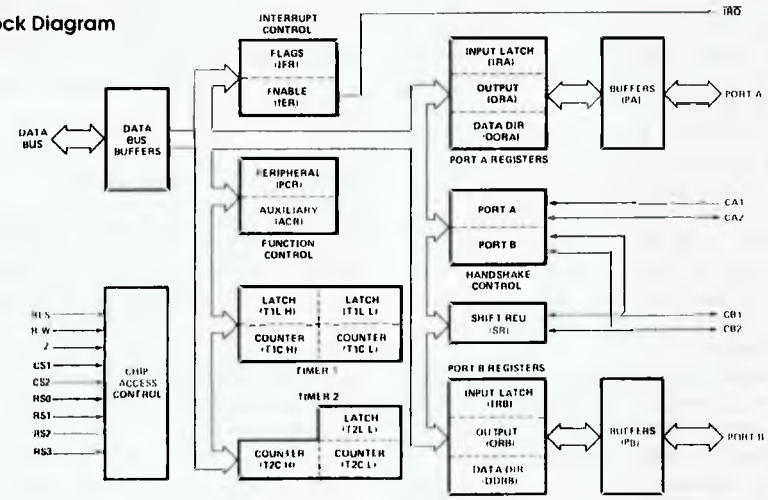
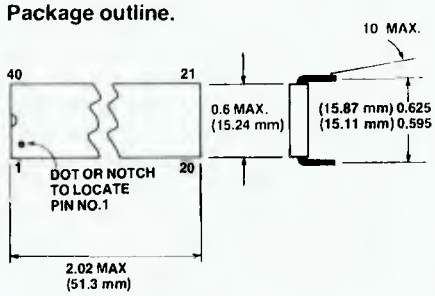
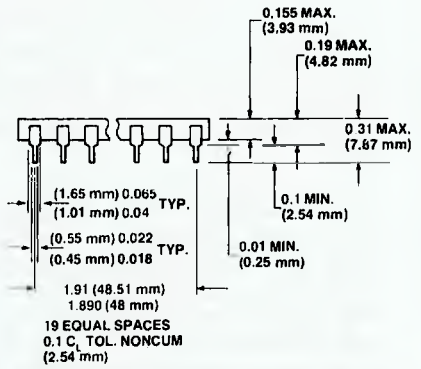


Figure 1. 6522 block diagrams and pinout (courtesy Synertek Systems Corporation).

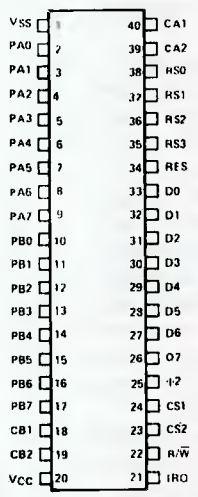
Package outline.



NOTE: Pin No.1 is in lower left corner when symbolisation is in normal orientation.



Pin configuration.



Ordering information.

Order Number	Package Type	Frequency Option
SYP 6522	Plastic	1 MHz
SYP 6522A	Plastic	2 MHz
SYC 6522	Ceramic	1 MHz
SYC 6522A	Ceramic	2 MHz

the 6522 is shown in Figure 1, together with the pinout.

I have three of these devices on my SYM-1 computer, all memory-mapped into 1K address blocks. The one I use for bank switching purposes is located at $a000 to $a3ff, and the memory map for this device is shown in Figure 2.

The two ports available for parallel I/O are called PA and PB respectively. Port A is already dedicated to my Epson MX-100 printer, together with two of the lines of port B. One of the lines of Port B is also already used for the input from the cassette recorder (in fact, two are used but the second is an option).

This port is therefore useless as an 8-bit I/O port, unless I wished to recover some of the dedicated pins and use the two available control lines for just that purpose.

Not having enough I/O lines, however, has never become a problem for me – the SYM has up to 71 of them if needed, and more can be added by 'fiddling'. The control line used for bank switching is the one marked PB4. This can be accessed by means of either the S22/44-pin edge connector (pin 13), or by a plated-through hole on the board. I have chosen the latter method as being easier to access. Lines PB3 and PB5 are the two lines used for control of the Epson, and lines PB6 and PB7 are used for the remote control of the cassette motors.

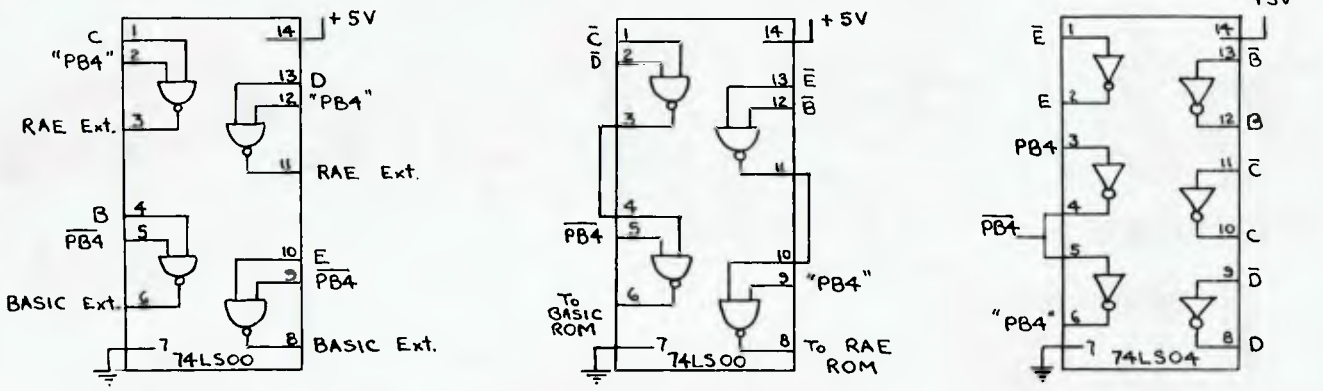
The Power-on-Reset (POR) routine initialises all the default parameters for the SYM, clears the screen, and then prints a menu of the systems available. Depending on the result of the user's input to the request at the end of this menu, the BASIC and its extensions are switched in or out of the same memory space as the RAE and its extensions.

This is accomplished by a bit of simple hardware and software. The software switches the PB4 line either high or low; the hardware comprises two 7400 quad two-input NAND gates, and one 7404 hex inverter. The LS (low-power Schottky diode-protected) versions of these chips are the best to use.

The actual wiring of these three chips is shown in Figure 2. The bar across the top of a chip input or output simply means that the signal being supplied by this pin is an active low (0 V TTL). The specific chip being selected will only have its contents placed on the data bus if the chip select pin (this is pin 20 on the Texas Instruments 2532 EPROM) is at 0 V TTL. Quotation marks around a signal mean that this signal is double inverted. This is used to compensate for the propagation delay encountered by running a signal through two different gates.

The software side of the bank switch-

Figure 2. Wiring diagram for bank switching; the letters indicate address lines from the address bus.



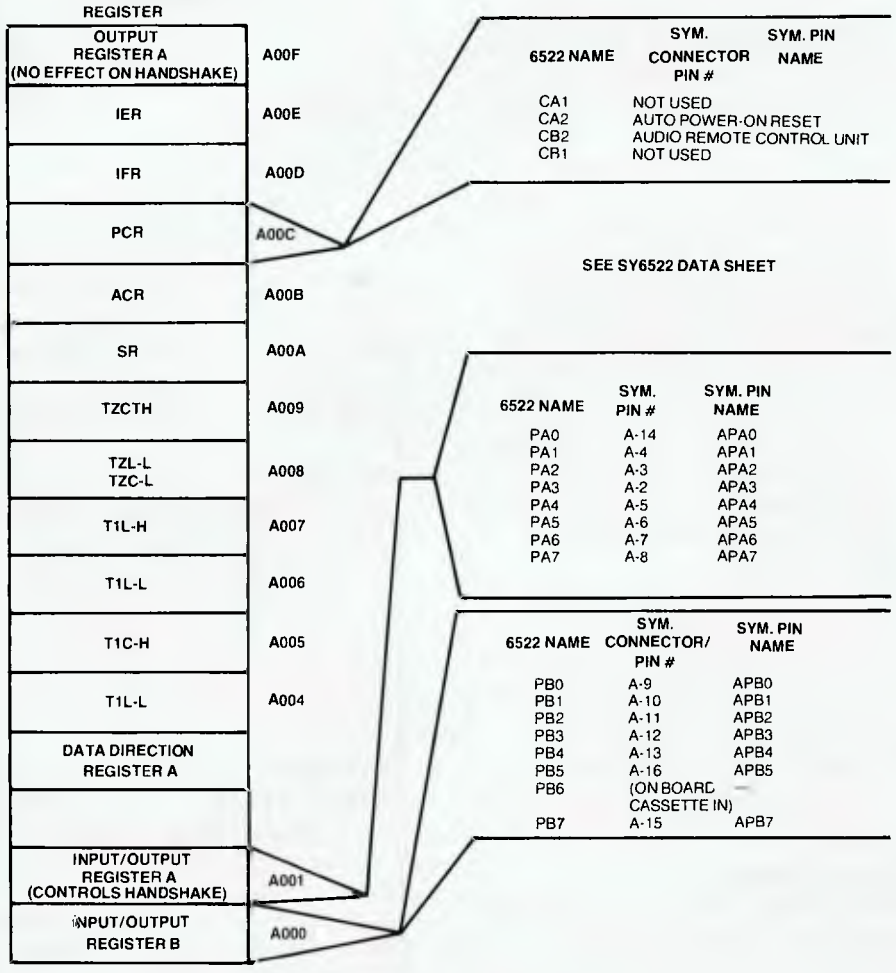


Figure 3. Memory map for SY6522 via #1 (Device U25). (Courtesy Synertek Systems Corporation.)

ing is fairly simple. Figure 3 shows the memory map of the VIA used for bank switching; this should be examined in conjunction with Figure 1. There are two registers that control the flow of data to or from the VIA.

The Data Direction Registers for ports A and B (known respectively as DDRA and DDRB) are used to fix the direction of the data flow. Each of the eight lines is individually capable of being set up as an I/O line. A TTL low in any bit of the DDR causes that line to act as an input line. A TTL high in any bit of the DDR causes that line to act as an output line. Thus to set PB4 to act as an output, we must set the corresponding DDR bit to a TTL high. In order not to disturb the contents of any of the other lines, we set this line by using the ORA command. The sequence used is shown in Figure 4. The section located at label SETHI sets PB4 to a TTL high and the section located at label SETLO sets PB4 to a TTL low.

Bank switching of RAM can be accomplished in much the same manner, using the control signal once again to switch the chip select line in and out of memory space. On the 2114 static RAM chip, for example, this is pin 8, which is also an active low.

I hope these two articles have been of use to the keen crowd out there, and above all, I hope it encourages you to climb into the insides of your computers (after the warranty expires, of course) and find out how they work. ❑

Figure 4.

```
>AS L
                        0010 ;          BANK SWITCHING ROUTINE
                        0020
                        0030 DDRB1      .BA $9000
                        0040 PB1        .DE $A002
                                        .DE $A000
9000- AD 02 A0  0050 BANKHI     LDA DDRB1
9003- 09 10     0060            ORA #$10
9005- 8D 02 A0  0070            STA DDRB1
9008- AD 00 A0  0080            LDA PB1
900B- 09 10     0090            ORA #$10
900D- 8D 00 A0  0100            STA PB1
9010- 60        0110            RTS
9011- 20 00 90  0120 BANKLO     JSR BANKHI
9014- 29 EF     0130            AND #$EF
9016- 8D 00 A0  0140 OUTBANK    STA PB1
9019- 60        0150 END.SWITCH RTS
                0160            .EN

LABEL FILE:  [ / = EXTERNAL ]

/DDRB1=A002     /PB1=A000       BANKHI=9000
BANKLO=9011     OUTBANK=9016    END.SWITCH=9019

//0000,901A,901A
```

microbee

SERIES 2 PERSONAL COMMUNICATOR

$499

microbee Series 2 PERSONAL COMMUN-ICATOR

Now ready for 1984 (watch out George Orwell, big brother is watching with envy!), the **microbee Series 2 Personal Communicator** has been designed to meet the needs of modern times. It has BUILT-IN WORDBEE in ROM as well as MICROWORLD BASIC and NETWORKING.

The Personal Communicator is a powerful home computer ideal for virtually any home use from wordprocessing, spreadsheet analysis, education and even experimentation with the computer concepts as they evolve during the year.

With the optional BEEMODEM you can send WORDBEE files across any telephone line to another computer. Bee the first on your block to have home telex!

A big feature of the **Personal Communicator** is the use of battery-backed CMOS RAM so that programs can be stored even when the power has been disconnected. This is particularly useful with WORDBEE or BASIC files which can be developed at home and then the computer can be taken to the school or office for printout. Of course the MICROWORLD BASIC is also built-in to your **Personal Communicator** so you can run any of the software developed for any **microbee** to date.

In fact, the **Personal Communicator** is also the **Experimenter** and **Educator microbees** fully expanded. You have the features of every machine. If your needs grow you may consider expanding your **Communicator** to the **Advanced Personal Computer** using disk drives. Ask your local **microbee shop** for details.

Specifications:

PROCESSOR: Z80A running at 3.375 MHZ

KEYBOARD: 60 key FULL SIZED QWERTY layout with full travel.

MEMORY: 68K comprising of 32K user RAM 28K ROM software, 4K character ROM, 4K graphics and screen memory.

DISPLAY: Direct video to external monitor or modified TV. 80 by 24 and 64 by 16 character display modes, high resolution PCG graphics to 512 by 256 pixels. Upper and lower case with full programmability at any screen location.

SOFTWARE: MICROWORLD 16K BASIC V5.22 in ROM, MICROWORLD Z80 machine code monitor, built-in diagnostics, NETWORKING with programmable baud rates from 110 to 4800 Baud, 7, 8 bit formats, half, full duplex transmission and complete file transfer using the 'HOBBY' standard Christensen protocol.

INPUT/OUTPUT: Programmable 8 bit input/output parallel port, programmable RS232 port, cassette interface, direct video, 50 way Z80 expansion bus.

Recommended Options:

microbee HIGH RESOLUTION MONITOR	**$199.00**
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microbee PRINTER	**$449.00**

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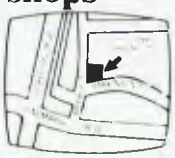

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Getting dBest From dBase

Part V

This month Les Bell continues his dBase tutorial with a look at the various parameters which control the operation of this popular database system.

your computer tutorial

THE OPERATION OF dBase can be varied in many subtle ways. For example, you may not like the way APPEND displays colons at the end of fields, or may not like the way the system beeps and moves on to the next field whenever the current field is full.

These attributes can be altered by use of a number of parameters which are described in the dBase manuals. There are over twenty of them, but they all work in the same way. The key to their use is the SET command.

SET and Parameters

The SET command takes two forms:

SET ‹parm1› [ON]
[OFF]

which allows toggled parameters to be switched on or off, and

SET ‹parm2› TO ‹opt›

which allows those parameters that need one of the different strings described below to have its value altered.

Probably the most important parameters for the beginning dBase programmer are those which assist in debugging. The first of these is the TALK parameter, which defaults to ON. Whenever a value is stored to a memory variable, that value is displayed on the screen, unless TALK is set off.

The result of this is that running programs will produce a stream of intermediate values on the screen, which will confuse the user (not to mention the programmer) and screw up beautifully designed screen displays. So the first line of most programs is usually

SET TALK OFF

which disables this feature.

The ECHO parameter is also useful in debugging. With ECHO set on, all commands which are read from a command file are also displayed on the screen. ECHO defaults to OFF. In effect, this is a trace facility for tracking program execution.

A similar facility is provided by the DEBUG parameter; with this set on, lines of command files are sent to the printer as they are executed. This avoids messing up screen displays. Again, DEBUG defaults to OFF.

An even more useful facility for tracking down bugs is the STEP parameter. With STEP set ON, the system will execute a single line of a command file at a time, then halt and wait while the user examines memory variables or enters other command lines, or quits the command file or continues. Again, STEP defaults to OFF.

The next group of parameters control where output goes. Like Unix, dBase provides a facility for redirectible I/O,

and treats devices and files alike – at least as far as output is concerned. Generally, output defaults to the console device, but that can be changed where necessary.

The three parameters concerned are CONSOLE, PRINT and ALTERNATE. SET CONSOLE ON will direct output to the screen, which is the usual selection and the default. Setting CONSOLE OFF does have its uses, though, as we shall see.

PRINT is usually set OFF, but with it set ON, any LISTs or DISPLAYs will produce output on the printer.

Finally, the user may wish to direct a report or other output to a disk file for subsequent editing or processing by another program. This is achieved with the ALTERNATE parameter. Two forms of SET ALTERNATE are involved. The first, SET ALTERNATE TO <filename> sets up the name of the file to which the output will be sent. SET ALTERNATE ON then starts collection of output in the disk file, and SET ALTERNATE OFF stops it.

There are several uses for these commands. For example, it is common to use the WAIT TO <memvar> command to input a single-character menu choice from the user. The only trouble is that the WAIT command produces a WAITING message on the screen, which most (well, some) programmers find aesthetically offensive. This code segment gets around that:

```
* Suppress screen output
SET CONSOLE OFF
* Accept input character
WAIT TO choice
* Enable output again
SET CONSOLE ON
```

Similarly, some programmers like to disguise the fact they wrote an application in dBase by suppressing the dBase sign-off message:

```
SET CONSOLE OFF
QUIT
```

Of course, they also rename DBase.COM to RUN.COM or similar, and the user thinks he's hired a hotshot CBASIC-2 programmer!

SET ALTERNATE has a number of uses, such as sending reports to disk files. It's also possible to create skeletal MailMerge letters and other text files by using SET ALTERNATE. For example, COPY STRUCTURE EXTENDED can be used to create a database containing the field names of the current database, and then a short dBase program can be used to produce a text file containing the appropriate .RV <fieldname> lines for MailMerge. This is more a matter of ingenuity than programming style, however. In addition, SET ALTERNATE can be used to produce audit trails.

Some parameters affect the full screen editing operations of dBase, such as APPEND, EDIT and CREATE. First, those unfortunate souls who do not have terminals with cursor addressing can implement a line-oriented version of dBase with the command:

```
SET SCREEN OFF
```

Naturally, it defaults to ON. This line-oriented version is truly dreadful to use. No further comment.

dBase screens generally use colons to delimit fields, so that the user can see how much space he/she has to type in names or other long data. However, if one designs a menu as a format screen with a single character input field, the colons are a bit of a giveaway as to how it was done, and are also none too aesthetically pleasing.

The SET COLON OFF command will get rid of them. SET COLON ON will display them again, and this is the default mode.

Don't Like The Beeps?

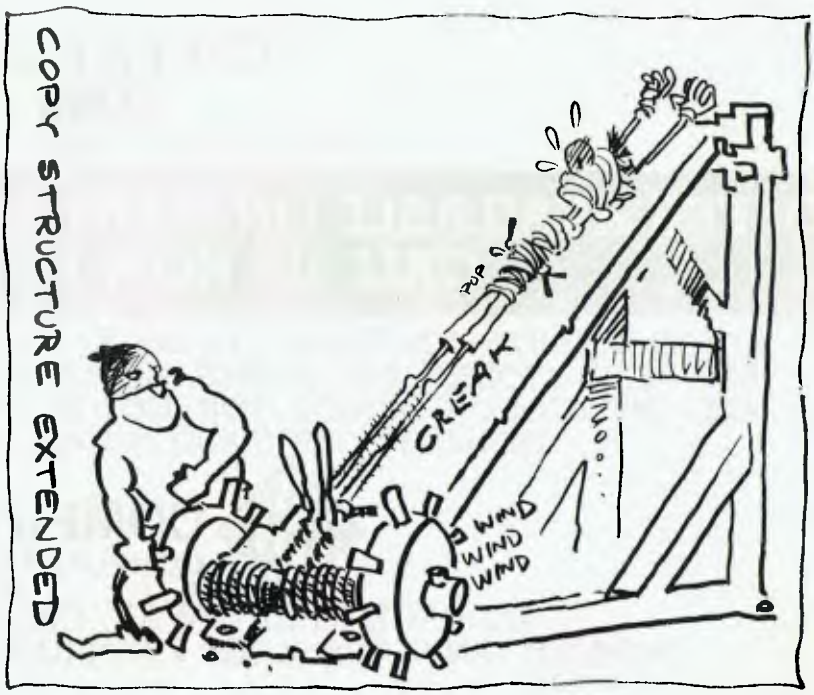
One default of dBase's that I don't particularly like is the way that when the user fills a field during append or edit, it simply goes on to the next field with a beep. When you're typing fast (and most data entry operators are fast), by the time you recognise the beep, you've filled half the next field with overflow from the current one.

SET CONFIRM ON gets rid of the problem. Now dBase will not proceed to the next field until you explicitly hit <CR>. It will still beep when a field is filled up, however, which is sensible.

If you find that all the beeping is driving your office neighbours up the wall, you can suppress the beeping with (here we go again) SET BELL OFF. It defaults to ON.

Some computers, like the Kaypro II, do not have half intensity video, and are in fact sent a little crazy by the nulls that dBase transmits in place of the absent half intensity sequences. The Kaypro displays lots of apostrophes in the middle of forms, for example.

Such machines can be sorted out by SET INTENSITY OFF (it defaults to ON). ▶



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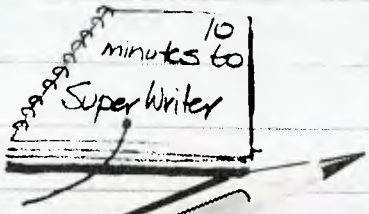

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your computer text file

Unfair to Dick

I HAVE just read the August 1983 issue of *Your Computer* and was pleased to see it was up to its normal high standards of readability for rank beginners like myself.

I was especially pleased to see the article on 'Cash and Carry Computers', as quite obviously that is where the average consumer will spend his money. However, I really don't feel that the article on the Dick Smith Wizzard was fair, as you have obviously treated this unit as purely a games machine. Owners will no doubt be fully aware of its games ability, and most of the games available are of excellent quality; as your writer observed, with the higher level of skill on the games the computer does like to win!

I do feel you could at least have given this unit a quick check-out on its computing abilities, as with the addition of the basic interpreter cartridge the unit becomes quite a powerful little unit and is very easy to use, especially for the creation of graphics, which are very similar to those of the TI 99/4A.

Eventually when all the proposed peripherals are released for this unit it will definitely be a contender for the home. Software is very scarce at present, but magazines such as yours could help by publishing the odd program or two.

I trust you may do a re-review of this great little unit; after all, profits from this computer are kept in Australia to help our economy. Incidentally, as you often complain about lack of information as to what processors these 'cheap' units use, the Wizzard uses a 6502.

Mr P Meehan
Lakemba, NSW

We wrote about the Wizzard as a games machine because they were the only programs the suppliers sent us for review with it. We'll be happy to print programs for the Wizzard (not just games!) in our 'Pocket Programs' section, and invite contributions from Wizzard users just as we do from all home computer users.

One Mistake

I DON'T USUALLY write letters to magazines but the letter from Alan Stephens (Textfile, August 1983 *Your Computer*) spurred me on. I fully endorse his remarks.

I first began subscribing to *Your Computer* for the tutorials and program listings, which were then both regular features.

Programs throughout the magazine are in most cases now printed in microscopic, illegible lettering. 'Pocket Programs', once a regular monthly feature, are now published as a rare and special treat. When they finally appear it is as a liftout, mostly illegible and printed on inferior-quality paper which ensures that commas, semicolons and other fine details are missed.

When discussing this problem with a friend the other day, he agreed and went on to say – "If they handle programs that way, what price their software and hardware reviews?"

MR S. BARBER
Waramanga, ACT

When we print program listings, as far as possible we use the original sent into us by the author, as to retype them increases the possibility of mistakes too greatly. We do the best we can to photograph the listings up so that they're both legible and not too faint, and often ask authors to print out new listings for us if the first one is too faint, but sometimes the result is still very dicey. So software authors please take note – when you send us a listing, make sure your printer has a new ribbon in it!

As for 'Pocket Programs', it is now scheduled to be published every second month, alternating with *Your Business Computer*. We produce it as a liftout because we understand that most readers find it more convenient that way, and again we do our best to make the listings legible and clear.

I'm sorry if people have suffered frustration because of a mistake they've copied from an unclear listing, but we do check the listings before they're printed to make sure we've done everything possible to avoid that situation happening. But you make one mistake and people never forget!

Out Of The Pot Into The Fire

BEING A BUDDING intrepid 'Adventurer' I decided to try out 'Escape From Rungistan' after reading your article on it.

With the help of several hundred interested fellow students we made it up to the jungle airstrip without too much hassle (although it was only luck that got us past the guard tower).

However, we have been getting cooked in the natives' pot now for quite a long time, and would be very grateful if you could provide us with some kind of hint to help us overcome this perplexing situation.

Our inventory up to now is:
Pilot's licence
Almanac
Bottle of Booze
Catcher's Mitt
Magnifying Glass
Money
Dynamite

We have read both books and know about the graffiti 'Nessen'.

Out theory is that we need the natives' cooking pot to obtain the gas to operate the plane, but at the moment we have no idea of how to rid ourselves of these frustrating natives.

Could you see your way clear to help us?

MIKE BANTICK
79 Lakeside Ave
Mt Beauty 3699

We wouldn't dream of trying to spoil it for you by giving you any hints (that's one way to get out of having to admit that no one here is an 'Escape from Rungistan' whiz) – but if any other readers have any tips, please pass them on to Mike and friends.

Missing Address

ONE READER has written pointing out that JH Crabb, in his March article, (Sinclair Goodies) had omitted supplying an address.

The address in question is:
Lamo-Lem Laboratories,
Box 2382,
La Jolla
CA 92038,
USA.

M M CRABB
Kiama, NSW

Vic Programs Wanted

I'M 12 years old and have a VIC-20. I am rapidly running out of programs. I have swapped with my friends and no one else has any programs.

Thank you for the Function Plotter program for my computer and for the Microbee programs in your magazine; I have a Microbee in my school.

However, the reason I wrote is to ask if you could supply some programs for the VIC-20, or put me onto someone else who writes them. Not the ones in your magazine, but some others, for I get your magazine every month. It would be very much appreciated.

DALE SZANCER
4 Magra Place
Kings Langley, NSW

Macro Text Editors

CAN YOU advise me whether there are any (preferably cheap) text editors around that run on CP/M and that can do macro runs for groups of repeatedly used editing commands?

Can you also advise me of a beginners instruction book on BASIC that is written specifically for MBASIC-80?

T WALKER
Rockhampton, QLD

According to Bill Bolton, our CP/M columnist, the best text editors available with macro runs are:

Wordmaster, distributed by Imagineering, and VEdit, available from Software Source, 344-348 Oxford Street, Bondi Junction 2022.

Bill reckons there isn't a book written specificaiiy for MBASIC for CP/M, so we can't help you there.

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Monitors — Amber Or Green?

We've only really started seeing amber monitors recently in Australia, although in the UK and Europe they've been popular for some time. Jane Mackenzie looked at two monitors from Amdek that make the choice between green and amber easy – there's one of each.

ALTHOUGH terminal and monitor screens are almost traditionally green on black for technical reasons, it's often been criticised as a colour combination that leads to eyestrain and related discomforts, particularly if someone is using the monitor for a long time. Various other colour combinations have been tried – including white on black and dark blue on light blue – but the only other colour that's gained acceptance is the so-called 'amber' screen.

This 'amber' is in fact usually a shade of yellow on a shade of brown, and one scientific reason given for its success is that yellow is the only colour that doesn't produce an image of its complementary colour on the retina. This apparently makes looking at yellow less taxing on the eyes, and so results in fewer complaints of eyestrain amongst operators.

Whatever the technical reasons behind the amber screen's growing popularity, most people judge the performance of a monitor from a subjective viewpoint – and I for one found an amber screen preferable to the green. I have an amber Kaga monitor attached to my Apple at home, and am subjectively convinced that this colour combination is 'softer' on the eyes than the old green-on-black.

Stylish Monitors

The result of my preference for amber was that, when Roland Corporation asked *Your Computer* to take a look at a new amber Amdek monitor the company is distributing in Australia, I was keen to see the standard of amber monitors starting to appear in this country.

The Amdek 300A is an elegant monitor, housed in a lightweight, industrial-grade beige cabinet. The screen surround is dark brown, which not only tones nicely with the beige, but also blends in well with the brown screen background and so avoids distracting the eye with extra colours. On the front of the cabinet are two controls: a combined pull/twist knob for power-on and brightness, and a contrast knob. All the other controls are neatly hidden away at the back of the cabinet.

Included in these controls are a vertical and a horizontal hold – although the monitor was perfectly adjusted when I plugged it into my Apple – and VLIN and VSIZE. These two controls alter, respectively, the vertical shape of the image and the vertical size of the screen. This is an extremely good idea, allowing the monitor to be adjusted to the screen image produced by any computer (although again it needed no adjustment for the Apple).

Rather than knobs which could be easily knocked, these two controls are Philips-head screws recessed into the

cabinet and attached directly to the pc board. Unfortunately, the recessing was so deep that I found it extremely difficult to adjust these screws, and impossible to see the screen whilst doing so. Perhaps something could be done to make the operation of a basically good design idea into a more ergonomically viable process.

The greatest asset of the Amdek 300A is its rock-steady image – not a flicker or a shimmer to be seen. The actual resolution of the characters is no better than on comparable monitors, but the steadiness with which they're displayed makes this unit particularly easy on the eyes.

This factor is accentuated by the non-glare screen; it feels like finely textured glass, and is highly effective in cutting down reflections. I was operating the monitor in artificial light with the light source directly behind me, and could see no reflections whatsoever.

The colour of the characters is a dark yellow, probably close to most people's conception of 'amber', and the background is a very dark brown. Both these characteristics are of course adjustable by using the contrast and brightness controls, but I found I needed both knobs turned all the way up to the lightest end of the range to get an acceptable image. This may be different in other lighting situations.

Green For The Traditionalists

The Amdek 300A has a sister monitor, the 300, for the traditionalists who still prefer the green-on-black colour combination. Its characteristics and controls are identical to those of the 300A, except that it has a green power-on light instead of the 300A's amber one!

The green of the characters is a very emerald green which could, I feel, be quite harsh on the eyes. However, the background also has a green tinge, which means the contrast between image and background is not as stark as it might otherwise be.

The Amdek monitors are claimed to be compatible with practically every microcomputer or word processor, and they come with a full one-year warranty covering both parts and labour. At $325 rrp they're not the cheapest monitors on the market, but they certainly have the quality needed for prolonged use or to save the eyesight of late-night computer freaks. ❑

Specifications

CRT:	30 cm (12 inch) diagonal, 90° angle
CRT phosphor:	P-31
Signal:	Composite video in
Scan frequencies:	Horizontal: 15.75 kHz Vertical: 50/60 Hz
Display size:	210(W) by 158(H) mm
Video response:	18 MHz (+/- 3 dB)
Resolution:	Centre: 900 lines Corners: 800 lines
Input impedance:	75 ohm
Semiconductors:	16 transistors, 20 diodes
Power source (Australia):	AC 240 V/50 Hz
Power consumption:	28 W
Weight:	7.7 kg net (17 lb)
Dimensions:	289(H) by 368(W) by 341(D) mm

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That Revolting Bee

AS A PROUD owner (of a Bee, of course) of two years' duration, I have been shocked by recent developments in the aesthetics of the Microbee. I liked the new case, but now ... NOW they have that yucky, urky-purky THING. That hideous epitome of the Crass twentieth century. I hate it! I hate it! Bleach! Heave!

I'm talking about that REVOLTING stylised Bee that is their new symbol. I propose immediate stop-work meetings for every union around the world to discuss the matter. Or at least a petition. I will be only too glad to co-ordinate any such action and any names and addresses can be sent to me (via the underground radio network). Together we can smash this evil uprising. Brothers (and sisters) unite! Bring back the old Bee!

DAVID PARRY
Yeronga, QLD

Backyard Dealers

I WOULD like to alert your readers to the existence of 'backyard' computer dealers, and to one in particular.

This company has advertised in recent issues of your magazine and has addresses in both Sydney and Melbourne – my problem being with the branch in Sydney. The advertisements were for two types of printers as well as programs for the Microbee.

I placed an order for a DP 510 printer; and on receipt it was discovered that the dustcover was broken, presumably in transit, and a significant amount of dust was inside the printer. The company was immediately notified by telephone, and they said a replacement printer would be despatched by overnight freight.

When the replacement had not arrived after two days, the company was again contacted, and they said they had to obtain a serial module to suit, but that this had arrived and the printer had been sent the previous day.

Once again no delivery resulted. The company then stated that the printer had not been sent, that they would not be sending a replacement printer, only the top cover. After some argument, it was agreed I would try out the printer and if I found it fully operational I would accept it, as they advised it carried a 90 day warranty. They agreed to send a new top cover immediately.

This had not arrived after one week. A letter was sent to the company stating, if the cover was not received within seven days, or I had received no written advice regarding the situation, further action would be taken against them. A clarification of the exact situation with the warranty was also requested, as further information indicated they would only honour it for 14 days after purchase.

No further contact has been received; action has been taken accordingly.

My suggestion to anyone purchasing items of any value is as follows:

(a) Deal with the larger, established organisations if possible, unless a thorough check can be made. You may save a few dollars with a 'backyarder' but it's not worth it in the long run.

(b) Try to obtain a written quote including the warranty situation. If the company is genuine, they will be happy to provide this.

(c) Ensure adequate insurance is arranged when sending items by any of the commercial transport organisations. If loss or damage occurs it's too late to find out if there was automatic insurance or not.

If anyone would like to know the name of this 'backyarder', they can phone me on (050) 23 3626.

DAMIEN VALE
Mildura, VIC

Date Formats

IN THE PAST few months there has been considerable debate in your pages regarding date formats, in particular the contention between the North American standard of MM/DD/YY and the European/Australian standard of DD/MM/YY.

While each format has advantages and disadvantages, critics and supporters, the time may now be ripe to introduce a third standard which appears to be supported mainly by the Japanese.

The format is (surprise! surprise!) YY/MM/DD, and its major advantage is that a date field encoded in this format can be used as a single sort key: for example, Y/M/D from 01/01/01 to 99/12/31, whereas the other popular formats require at least two keys.

Thanks for the continuing excellence of your magazine, and this opportunity to further confuse the issue!

GARY WOODMAN
Darwin, NT

dBase Missing

I AM WRITING to let you know that I bought the September issue of 'Your Computer' only to have the third part of your series on dBASEII and, as you know, the promised (August publication) third part was not included.

When I do my shopping, I do not have time to look through any magazine to check what is in it before I make the purchase so, as you can imagine, I was more than a little annoyed to find that the article I wanted was missing!

JUDY MIKKELSEN
Weetangera, ACT

We're sorry you were inconvenienced; we try to publish parts of series in consecutive issues, but occasionally pressures of time or space prevent us from doing this. The fifth part of 'Getting dBest from dBase' is on page 80 of this issue.

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REVELA

Hottest selling new home computer in UK and Europe – over 30,000 per month – and recently named Home Computer of The Year in France!

Here's the one the others

Today, you have the choice of more home computers than you can poke a stick at. And, it's fair to say that they all claim to be "the best" – to such an extent that you can't help wondering, "WHAT EVER HAPPENED TO TRADE PRACTICES?" Well, this is all about a computer for the first-time buyer that the others would rather you didn't know about. The Oric-1.

What you pay and what you get.

They'd rather you didn't know that the Oric-1 has up to 64K, yet costs from just $299. It would drive them round the bend if they knew that you knew that the $299 also bought you six true colours in addition to black and white. They'd be frothing at the mouth if you also knew that MICROSOFT® EXTENDED BASIC is part of the price, together with sound that's loud and clear (not just a muddy "bleep"). And they'd be on a guaranteed, one-way trip to the loony bin if they knew you knew the Oric-1 is backed by heaps of software and a 90-Day Warranty which is entendable to 12 months if you wish. There's more . . .

ORIC-1 plugs directly into the aerial socket of your TV.

It also has an RGB outlet if you require colour monitor quality. Text and graphic displays are ultra-bright, giving 40 characters of 28 rows. 8 foreground and 8 background colours can be displayed at any one time.

HIGH RESOLUTION GRAPHICS With Oric you have the choice of full Alpha Numeric computer standard character set, or TELETEXT (CEEFAX/ ORACLE) Alpha Mosiac graphics. The ORIC has, of course, Teletext/Viewdata compatible displays, plus the added bonus of being able to create up to 96 characters of your choice. Add to these features both flashing and Double Height characters and you can start to appreciate the full capability of ORIC-1.

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The Oric-1 comes with the 167 page Oric Programming Manual and special demonstration cassette.

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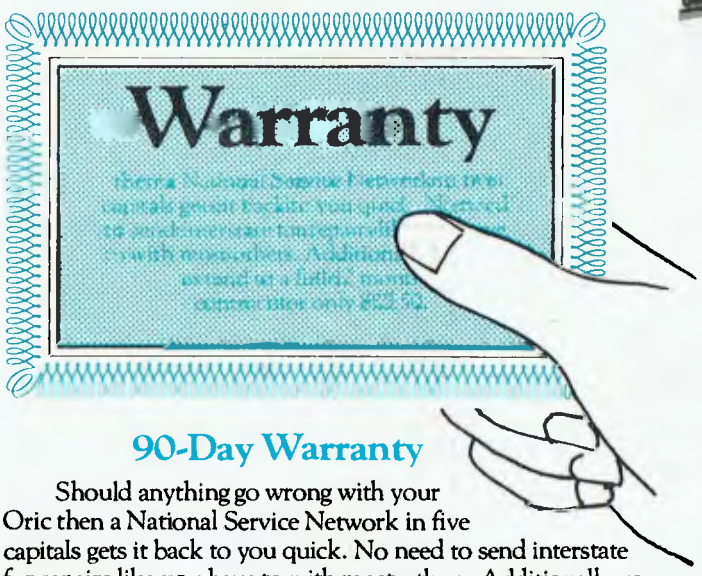

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your VIC 20/C64 computer

By Andrew Farrell

FIRST OF ALL a big welcome to all those new Commodore 64 and Vic 20 owners out there, thumbing their way through the User guide and cursing the speed of cassette loading. Hopefully you will have several years of trouble free operation ahead.

Zork...now at $25!

Several months back I mentioned the release of the Zork series and recently received Zork II and III for review. Just to refresh your memory, Zork is one of the most popular disk-based test adventures around on several other computers (whose names shall remain unspoken... Apple TRS-80, CP/M systems and so on).

The game is built around the belief that computers graphics can never replace the human imagination, inspired by descriptions so vivid, at times you almost forget it's just a game.

Zork also implements Infocom's unique Interlogic languages, which allow the player to communicate with the game in a far more English manner than most other adventures.

With a vocabulary of around 600 words and the ability to decipher the meaning of complex sentences, make assumptions on missing words or point out the exact reason for errors, Zork is a pleasure to play.

Set in a vast empire, riddled with strange mysteries, treasures and creatures, it's possible to spend several weeks on the entire series. (Maybe even several months!)

Zork II and III extend the original world and add various other characters such as the Wizzard of Frobozz, who may be spoken to and in some instances directed to carry out simple tasks.

Features such as frame saving, commands to control the length of descriptions, (Brief, Verbose and Superbrief), special abbreviations and score are standard on all three Infocom adventures.

So far I have spent many a wet weekend playing Zork (not to mention several sunny ones), and can recommend it to anyone who enjoys a challenging adventure with plenty to explore.

All three adventures retail for $25 each on disk (sorry, not on cassette) and are available from most dealers across Australia. My review copy came from Commodore Business Machines.

Extended Background Mode

The 64 has several modes of operation, including Hi-Res, Multicolour and Text. However, one that everyone seems to be unaware of is the Extended Background mode.

This mode allows four different background colours instead of the usual one. To use this mode, type:

POKE 53265, (Peek (53265) or 2 ↑ 6)

To get back to normal text operation, type:

POKE 53265, Peek (53265) and (255-(2 ↑ 6)).

Four registers contain the background colours for the EBM. These are:

POKE 53281,x – colour 0
POKE 53282,x – colour 1
POKE 53283,x – colour 2
POKE 53284,x – colour 3

x may be any number in the range 0-15, in the same way as colour memory.

The character set is now divided into four blocks of 64, each one being in the corresponding background colour of its register.

If, for example, register zero contained red, register one contained green, register two contained orange and register three contained blue, then the letter 'A' would appear red if printed.

However, if the letter 'A' was shifted, it would appear as a normal 'A' on a green background. A reverse 'A' would appear on background 2, and a shifted reverse 'A' would appear on background colour 3.

As you can see, this will limit the number of characters displayable to 64, but gives a lot more colour.

Hover Bovver

Jeff Minter has been at it again, only this time he has come up with a very interesting game which I think he can claim is almost entirely original.

Hover Bovver is a great combination of sound, graphics and, wait for it ... mowing the grass! No, that wasn't a print error, your mission is not to blast everything to bits, but to mow as many backyards as possible.

You will of course be harassed by your next-door neighbour from whom you borrowed the mower without asking. Luckily you have three neighbours, so if the first is quick to grab his mower back, you can always try the next.

Neighbours can easily be repelled by your pet dog, but you can't rely on him forever, as any dog has only so much loyalty. The gardener will also be happy to grab that mower if you happen to venture into the flower patch.

Thank goodness for the hedges which you can hide behind. There are plenty of levels (gardens) and watch that dog's tolerance – he doesn't like mowers much.

Great music (English Country Garden) and colourful graphics also help to make this game potentially addictive. Don't be fooled by first impressions; play it for a while before making a decision.

Hover Bovver is available from most dealers on cassette for $29.95. My review copy came from Progressive Software and is well played at our house.

'Kongo Kong' is now available for the 64, complete with nine levels of difficulty and the full four screens of its famous ancestor, Donkey Kong.

The game incorporates some well-designed graphics and sound, with the usual array of conveyor belts, rolling barrels and other nasties. It is very good value at $24.95 on cassette, from Ozi Soft. (Also, watch for Cops and Robbers for the 64, based on the original VIC-20 game of the same name, now a complex real-time adventure.)

Pal 64

Everyone would love to own a full assembler editor that is easy to use, compact, well documented and still as comprehensive as you could ever want. Well, Pal just about fits that description perfectly.

PAL stands for Personal Assembly Language and allows a machine code program to be easily entered, edited and assembled. The same file format is used as for BASIC programs, making the transition to Assembly language programming easy.

Pal sits in just over 4096 bytes of memory and may be run with Power 64 (more on that in just a moment) for a total of 8K.

Special opcodes allow a program to be written which includes BASIC and machine code as one file and may then be assembled and run.

After several hours use I was highly impressed with Pal and I now use it for ▶

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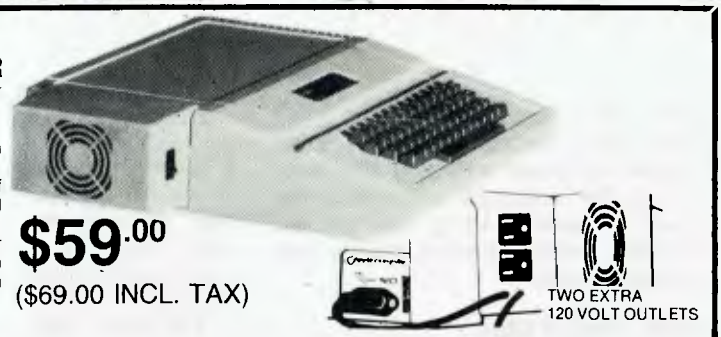

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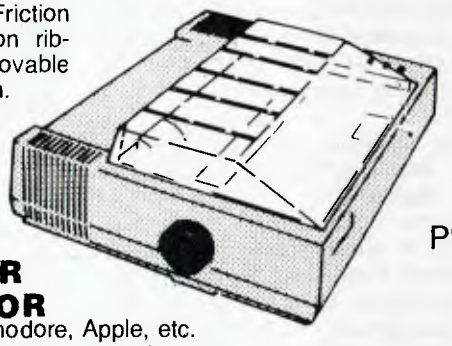

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all machcode programming. It is convenient, simple to use and flexible.

Pal is available from most dealers or direct through Pittwater Distributors.

Power 64

All BASIC programmers deserve to use the features in this toolkit which has everything from Merge and Renumber to interpret driven key checks. Sound good?

Other features include redefinable function keys, hex conversion, undo (to retrieve new programs), disk commands and much more.

The ultimate utility program, Power is well documented by Jim Butterfield and Brad Templeton, the author of Pal. The real fun begins when utilising the compatibility of Pal and Power programs.

All Power commands may be used when entering source code on Pal – an excellent combination by any standard.

Power is also available from most dealers or direct from Pittwater Distributors.

64 Tips

The following pokes are useful for crash-proofing programs and for protecting valuable software from being copied. The normal value of each location will reverse the previous poke.

POKE 775,200	disables list command; normal value is 167
POKE 808,239	disables stop key; normal value is 237
POKE 808,225	disables restore and stop key; normal value is 237
POKE 818,32	disables save command; normal value is 237
POKE 816,32	disables load command; normal value is 237
POKE 649,0	disables keyboard; normal value is 10

Plenty more next month, including a program to convert programs from text files and text files to programs.

Sydcom 64

The Sydney Commodore 64 Users Group has been doubling in size every month and recently announced plans to move location from the now overcrowded classroom above Computerwave.

At the time of writing, Redfern Technical College looked as though it would be the final choice. People wishing to confirm the venue for the next meeting, on the first Tuesday of February, should contact Paul Bartolo on 607-6228 or myself on 99-2640. ❑

By Lloyd R Borrett

IT IS NOT feasible to carry out a full evaluation of all similar software packages before selecting one as 'The Best'. To overcome this, I carefully study all product reviews available and select one package in each category for review. If it meets my requirements it's added to my list of recommended packages.

When consulting with potential users I find most of their software requirements are met by items on this list. If not, we track down a suitable product, and update the list. Often these users have come to me after talking to the sales staff of IBM dealers. Usually they complain of feeling the dealer was recommending only items in stock, or those with the greatest mark-up. Potential users are not in a position to carry out full evaluations, so they look elsewhere for independent advice.

For what it's worth, here's the list. The items marked ** are in day-to-day use. Those marked * are packages which have only been reviewed. The unmarked items are on my wish list, having been selected after reading reviews by others.

Systems Software

Languages:
** IBM/BASIC Compiler
** IBM/BASIC Program Development System
IBM/Macro Assembler
IBM/Fortran Compiler
Computer Innovations/CI C86 C Compiler
Logitech/Modula -2 Compiler
Digital Research/DR LOGO

Utilities:
** Central Point Software/Copy II PC
Peter Norton/Norton Utilities
** Rosesoft/ProKey
SSI/P-Edit
Softcraft/Btrieve
** Micro Ware/87 BASIC
Micro Ware/87 Macro
Micro Ware/87 Fortran

Applications Software

Communications:
** Persoft/SmarTerm/PC TE400-FT
* Persoft/SmarTerm/PC TE100-FT
* Microstuf/Crosstalk XVI

Data Management:
** Ashton Tate/dBase II
** Fox and Geller/Quickcode
** Fox and Geller/dUTIL
Humansoft/DBPlus
Micro Technical Products/Cardbox

Financial and Spreadsheet:
** Lotus Development/1-2-3
** Software Arts/TK!Solver
** Software Arts/Financial Management Pack

Graphics:
** PCsoftware/PCrayon
Software Projections/Slide-Pro
BPS/BPS Business Graphics

Project Management:
Harvard Software/Harvard Project Manager

Word Processing:
** Softword Systems/Multimate
Oasis Systems/The Word Plus
Oasis Systems/Punctuation and Style

Educational

** Individual Software/The Instructor
** Individual Software/Professor DOS

Of equal importance would be a list of the packages tried and rejected, but I haven't the space to include it. Some of these packages are not handled by distributors in Australia, and have to be purchased via United States mail order houses.

Naturally, there are gaps in the list. In some cases this is because the category hasn't come under close study yet, in others it's because the packages available have been rejected.

Getting An IBM-PC At A Discount

I have found you can buy your IBM Personal Computer for 18 per cent less than IBM wants you to pay. IBM manufactures certain parts of the PC, while other manufacturers produce the rest of the system with IBM acting as the middleman.

Some of the IBM components are competitively priced. However, for most of them, and nearly all the components manufactured by other companies, it is a different story. Prices there range from high to outrageous. This is where we can obtain our discount.

I will assume that you require some serious computing power. A suitable configuration would include at least 256K of memory, two double-sided disk drives, one serial port, a printer and a monochrome screen. The following table shows the price for this system, as purchased from your IBM dealer, with only IBM components:

*System unit: 64K memory, 360K disk drive	$3429
Monochrome display	$ 644
*Monochrome and printer adaptor	$ 516
80 cps graphics printer	$1004
Printer cable	$ 89
64/256 memory expansion option	$ 534
Two 64K memory expansion kits	$ 502
Second 360K disk drive	$ 821
Async communications adaptor	$ 188
Async communications cable	$ 122
Total:	**$7849**

Table 1.

To obtain a discount, first buy those items which are unique to IBM. These items are marked in the previous table with an asterisk. The total cost is $3945.

Next, focus your attention on the remaining items. This, bargain shoppers, is the part of the computer that IBM does not make, and can be purchased in single quantities from the normal distribution sources. The following table gives the prices you should expect to pay:

IBM-supplied components	$3945
Samkor MCG-12G green video monitor	$ 185
Epson RX-80FT printer	$ 740
Tandon TM100-2 disk drive	$ 385
Sigma Design SDI-ESC 192K memory, one serial port, games adaptor, free software, one parallel port, calendar clock	$1000
Async communications cable	$ 60
Printer cable	$ 60
Total:	**$6375**

Table 2.

That is a saving of $1444, or more than 18 per cent. If you are still with me, you must be interested, and you will be waiting to find out the catch. Well, there are a few. First, and most obvious, you must give up the convenience of one-stop shopping.

The sources of the cheaper components? Ellistronics in Melbourne assure me that the Samkor video monitor is compatible with the IBM PC, although I haven't tried it yet. There are IBM dealers and electronics stores which have other compatible monitors. Try out any monitor before buying, to see if you find the resolution acceptable.

Most computer stores carry the Epson printer. Just shop around to find the best price. The Sigma Design SDI-ECS multifunction board is but one such board now readily available. If you follow a 'Buy Australian' policy, you might want to check out the Plus-5 board from Personal Computer Peripherals.

The Tandon disk drives can be obtained from Adaptive Electronics, 418 St Kilda Road, Melbourne 3044. Phone: (03) 267 6800. They should also be able to put you in contact with a Tandon dealer in your local area. For the cables, go to your nearest electronics store and buy the bits to make them up yourself.

Another catch is the aesthetics of buying the cheaper equipment. The printer will not sport an IBM paint job. Worse still, the printer, monitor and diskette drive will not have an IBM logo. The rest of the items are out of sight, so who cares?

This next disadvantage might put some people off. If you buy a complete system from your friendly local IBM dealer, it should be delivered completely ▶

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assembled and checked out. If you buy individual components from different sources, you have to assemble and check them out yourself. The only component that may cause problems is the second diskette drive.

Installing Diskette Drives

You will find detailed instructions in the 'Guide to Operations' manual about removing the cover and gaining access to the internals of the PC. As you should already have the IBM controller board and one diskette drive, you should also have the associated installation manual. For those who don't, a brief description follows.

Probably the hardest part of the whole installation is to remove the cover plate over the opening where the drive goes. Once you have the cover plates out of the way, slide the diskette drive half-way through the front mounting panel. Keep the drive as straight and level as possible as you install it. If you cock the drive, you can catch board components and break them off.

Connect the power supply connector to the bottom side of the logic circuit board. Either connector may be installed in either drive; just make sure that it's orientated correctly. Now, connect the signal cable. These connectors are not interchangeable. Slide the diskette drive in until the front panel is flush with the system unit face plate. Mount the diskette drive, with two 6-32 by 3/8" screws through the side mounting plates.

The final task is to carry out termination and configuration. Termination is easy: just make sure the terminator chip is plugged in to drive A, and remove the chip in drive B.

Configuration requires that you remove the jumper DIP from the new drive and break six of the seven links. Only the third link – counting from the left-hand side, looking towards the front of the system unit from the rear – should remain. The easiest way to do this is to turn the jumper DIP over, lay it on a hard surface, and punch out the unwanted links with a jeweller's screwdriver.

Now, reinsert the DIP, being very careful to get the remaining link in the proper position. To complete the installation, set the system board switches as instructed in the 'Guide to Operations' manual. Replace the cover on the system unit and run the IBM diagnostic program.

Warranty

The final complication in this method of obtaining a discount has to do with your warranty. If you buy all the recommended components new, they are all individually guaranteed, but not by IBM. If you have problems, it will be your responsibility to determine what component is in error and send that component to the proper place for service.

If an IBM component needs service you must (according to IBM) remove all non-IBM parts before sending the unit in for repair. However, there are already a number of independent service firms which will take on the maintenance of the complete system. So, if during the warranty period you have a minor problem with an IBM component, it should be easier to have an independent service firm carry out the repairs. If it's a major problem, take out the non-IBM components and use the official channels. Once out of warranty, the independent service firm would be used for all repairs.

The problem is not as great as it may at first seem. You can buy less expensive monitors and Epson printers from most IBM dealers. Some IBM dealers are installing Tandon diskette drives, but charging IBM prices. You may be able to get your IBM dealer to install the Tandon drive and charge Tandon prices. Many dealers and independent service firms will supply IBM compatible cables which cost a lot less.

In summary, you can obtain large hardware savings if you are prepared to put up with the possibility of some inconvenience. If you talk to your IBM dealer, you may still be able to achieve one-stop shopping with full warranty cover, but may not achieve the same level of savings.

I admit that a near optimum case has been presented and that I didn't use all these options when putting together my system. At the time my system was purchased, compatible monitors were not readily available, although I've yet to see one with a standard of resolution which matches the IBM monitor. I did buy an Epson MX-100 printer, an AST Research MegaPlus multifunction card, and two Tandon diskette drives.

It is up to you to decide how far you are prepared to go.

IBM-PC User Groups

Don Richards is trying to start up an IBM-PC user group in South Australia. Those of you who are interested should contact Don on (08) 261 9590, or write to PO Box 68, Walkerville 5081.

The first meeting of the Melbourne PC User Group was held late in November

'83. My thanks to those dealers who offered their help, and special thanks to Computer Power, who provided the venue and organised the refreshments.

Over forty people attended the meeting, and a simple survey showed it was a fairly representative group with a diverse range of interests. Everyone was keen to see the group properly established, and an interim committee was appointed. The second meeting will be held at 5.30 pm on Wednesday, February 8, 1984, at IBM's offices, 211 Sturt St, South Melbourne.

The contact for the group is:
Christopher Leptos
c/- Pannell Kerr Forster
500 Bourke St
Melbourne 3000
(03) 605-2222.

Another user group has been formed in the Illawarra area. The Illawarra IBM-PC Club holds its meetings on the first Tuesday of each month, starting at 7.30 pm, at the John Lysaghts Springhill Training Centre.

Public Domain Software

As the deadline for submitting this column grows near I'm close to finalising arrangements for the distribution of the PV/Blue User Group Library diskettes. A summary of the library contents will appear in the next column, along with full details of where to get the diskettes.

The full catalogue, which contains a table of contents and brief description of the files, is available, post-paid, for $10. The address for orders is:

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Elsternwick 3185.

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Unprotecting Lotus 1-2-3

For those of you sick of not being able to back-up Lotus 1-2-3, or fed up with requiring a diskette to use 1-2-3 on the XT, here is a patch which disables the Release 1A program's protection mechanism.

First, format a new DOS system diskette, and then use the COPY command to copy all the files from your Lotus 1-2-3 system disk onto the new diskette. The example assumes that a DOS system diskette with DEBUG is in drive A and the new Lotus 1-2-3 diskette is in drive B.

Enter all underlined text exactly as shown; be sure to include spaces. End each entry line with the 'enter' key. The computer responds with all other output.

```
B>rename 123.exe 123.old
B>a:debug 123.old
-eaba9 90 90
-w
Writing 15F00 bytes
-q
B>rename 123.old 123.exe
```

Epson FX Series Printers

All the Epson FX series printers I've installed recently came with the internal DIP switches set to select the English character set. Unless the US character set is selected, you will have some strange-looking printouts.

The FX series of printers has a 2K buffer. However, the factory setting of the DIP switches disables the buffer, which allows you to down-load your own definitions for two additional character sets (256 characters). As I've yet to come across a software package which makes use of this feature I suggest you change the switches to enable the buffer. Then, short documents can be printed while you continue with other work.

The settings recommended for Switch #1 (SW1) are:

1	2	3	4	5	6	7	8
OFF	OFF	OFF	ON	OFF	ON	ON	ON

Table 3.

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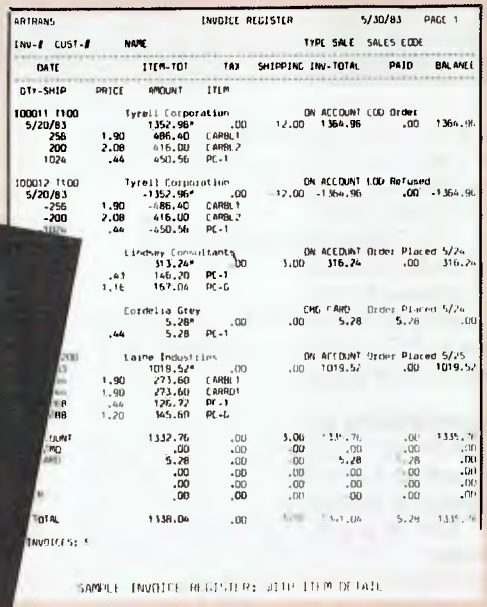

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By Bill Bolton

COMDEX/Fall

AHHH! It was BIG. Last year it took the best part of two days to get around everything at COMDEX/Fall, but this year I spent four days just getting to see everything once. The show spread over five different display sites. Three were reasonably close together in the immediate vicinity of the Las Vegas Convention Centre, but the other two were distant from the Convention Centre. Many other COMDEX/Fall attendees that I spoke with weren't bothering to look at the remote sites at all. Someone calculated that there were 21.5 kilometres of aisles at COMDEX/Fall this year.

There was no single thing which stood out as 'the product' of the show – last year it was clearly Lotus 1-2-3. On reflection, the Tandy 2000 came closest. This new micro Tandy is a departure from Tandy's previous policies in that there is no TRSDOS at all for it. The standard operating system is MSDOS and the machine is clearly aimed at taking back some of the market share Tandy has lost to IBM.

The 2000 uses an Intel 80186 CPU running at 8 MHz and uses 16-bit memory. This will make it considerably faster than the IBM-PC and nearly all the rest of the field in terms of raw CPU action. The mass storage capacity is over 700K per floppy disk and a 10Mbyte hard disk version will also be available. On-screen graphics resolution is 600 by 400, again well ahead of the IBM-PC. I'm sure there will be further details elsewhere in *Your Computer*, so I won't repeat them here.

Other trends seen this year include: many more IBM-PC lookalike computers; a lot more talk about porting software to Unix environments 'in the future' (in expectation of AT&T's entry into the micro market place); but conversely, much less interest in currently available Unix-based systems; lots of Lotus 1-2-3 competitors; plenty of interest in 'expert' systems with some fascinating examples being introduced; a developing interest in truly portable computers (some previews of the next generation were available if you knew the right people); a proliferation of Bell 212A 1200 bps modems; window interfaces to operating systems from Digital Research, SofTech and Microsoft (more on that later); and much more IBM mainframe-to-micro communications software and hardware.

Several Australian manufacturers showed this year. When I went by, the Amust stand was crowded, as was the Labtam stand. Unfortunately, the Australian contingent was in one of the remote display areas and didn't get the attention it deserved.

This year I tried extremely hard to contain the amount of paper I had to ship back to Australia by only collecting information on the products that were really important for me. Even so I ended up with half a dozen 'show bags' full of brochures, catalogues, pamphlets and so on.

dBase Run Time Conference

The first dBase run time conference was held on H.M.S. Queen Mary at Long Beach, California, from November 10th to 12th. The conference was intended for software developers who use dbase II and the new dBase II Run Time package.

The conference had several sessions on software development techniques, financing development, establishing distribution, promotion and so on, which everyone attended. Later there were optional sessions on various technical aspects of dBase such as: 'Inside the Black Box', in which Wayne Ratliffe spoke about some of the internal organisation of dBase II; 'New Versions of dBase' which gave a peek into the future; and others which covered things like documentation and marketing. There were six optional sessions in all, but only time to attend three of them. This was disappointing as I would have liked to attend all six technical sessions. Ah well, at least they taped all the sessions and I have the cassettes on order.

On the second evening, Ashton-Tate threw a cocktail party at the 'Spruce Goose'. The 'Spruce Goose' was Howard Hughes' gigantic flying boat. Still the largest aircraft ever built, it is now enshrined in a massive dome at Long Beach where it made its one and only flight. The dome is set up as a memorial to Hughes and his achievements in the field of aviation and you can walk through part of the 'Goose' itself.

The conference was delightfully informal on the whole and I got to meet some real 'characters' from the US software scene. Ashton-Tate plans to hold further dBase II conferences in the coming year.

Windows

Microsoft tried to freeze the micro market for window products by announcing their 'window' interface for MSDOS just a few weeks prior to COMDEX/Fall. The Microsoft window interface requires software to be written specially to use the window interface and it won't be available until April in the US anyway.

Microsoft had an impressive list of software suppliers who were going to support their windows, but IBM was noticeable by its absence from the list.

Meanwhile, at COMDEX, both Digital Research (for CCP/M-86) and SofTech (for P-system) introduced window interfaces for their respective operating systems, which will work with any software. This effectively unfroze the window marketplace again.

I'm not sure who has the best window interface yet. It will take a bit more time to tell. All three overseas vendors should have their window interfaces hitting the market at around the same time.

The Intel 186 and PC/MSDOS

There has been some speculation about why IBM didn't use the Intel 80188 in the PC Jr. When IBM customised PCDOS for its PCs it used a couple of the Intel reserved vectors for PCDOS, despite Intel's clear reservation of these vectors for future use. Well, use them they did in the 80186/88 chip.

MSDOS doesn't use these vectors, so there is no reason why an MSDOS machine cannot use the 80186/88, as the new Tandy 2000 does. There are several claims and counter claims flying around between Intel and Microsoft on this one, while IBM sits back and remains silent. I wonder what the 'real' story is? Just how compatible are PCDOS and MSDOS?

PAMS Numbers

Mi Computer Club BBS (MiCC-BBS): (02) 662-1686 24 hours EST
Micro Design Lab RCPM (MDL-RCPM): (02) 663-0151 24 hours EST
Sydney Public Access RCPM (SPA-RCPM): (02) 808-3536 24 hours EST
Melbourne CBBS (MICOM-CBBS): (03) 762-5088 24 hours EST
Sorcerer CBBS (SUGA-CBBS): (03) 836-4616 24 hours EST
Gippsland RCPM (GL-RCPM): (051) 34-1563 24 hours EST
Perth RMPM (WA-RMPM): (09) 381-6070 6pm-9pm WST.

By Dom Swinkels

THIS MONTH we take a closer look at the use of PEEK and POKE commands in BASIC (at the request of a reader), and I have used this occasion to list some of the useful memory locations you might like to PEEK at.

The title of the column has been changed to include Hitachi computers other than just the Peach, such as the 16-bit machine, which is now generally available. Also, the names 'Peach' and 'Success' (for the 16-bit machine) were apparently registered by John Miller. Since he is no longer associated with importing the Hitachi machines into Australia, these names are no longer to be used to describe the Hitachi machines. So until someone comes up with some new catchy names I guess we're stuck with MB-6890 and MB-16001. Any suggestions?

I thought of 'Little Hit' and 'Big Hit', but I don't know what I would call a future machine based on a 32-bit microprocessor. In any case, what do you call an MB-6890 with a Z80 card in it? If you have any suggestions send them to the letter column of *Your Computer*.

PEEKs And POKEs

The PEEK and POKE commands in BASIC allow us to interact with the computer at its lowest level, since they allow us to read a memory location (PEEK) or to modify a memory location (POKE). We have used this capability previously to print out segments of memory (MEMLOOK1 program in the October 1982 issue) and to enter a small machine language routine to make sounds on the speaker ('Sounds' in the March 1983 issue).

We can read any memory location, but we can only modify those locations which are *capable* of being changed; that is, the RAM part of memory. The Read-Only Memory (ROM) is exactly that; it can only be read.

PEEK and POKE are clearly complementary BASIC words and in any manual should be considered together. The purists will argue that POKE is a command (it tells the computer to do something) and PEEK is a function (it returns a value). My practical answer is that it is much more important to see these two BASIC words together and to stress their complementary nature than to stress their differences.

There are of course differences in format and these are again best seen side by side. The formats are:

<variable name> = PEEK(<memory location>)

POKE <value 0-255>, <memory location>

Note that with PEEK the memory location is placed between brackets (as for all functions, for example SQR(10), says the purist), while with POKE no brackets are used.

Since PEEK and POKE operate on a single byte (8 bits) the range of the value POKEd into memory or returned to the variable by PEEK must be in the range 0 to 255, because 255 is the largest number we can express in an 8-bit binary code. PEEK does not have to be used with a variable but can be made part of any statement in which an integer number can be used.

The BASIC operating system of the MB-6890 uses a number of memory locations to keep track of things such as the date and time, the current mode of operation such as screen width, size of the scrolling console, the type of cursor being used and whether any level of protection is to be applied to the current program. Some of this information is available via normal BASIC commands (for example TIME and DATE), or it can be obtained by PEEKing in the right locations. Once the locations for this type of information are known you can also modify them by POKEing a new value into that location. Sometimes you find that additional capabilities exist, which are not accessible via the standard BASIC commands.

As an example, let us look at the control of the cursor. The third parameter of the LOCATE command allows us to set four types of cursor, namely:

0: non-blinking underline
1: no cursor
2: fast blinking underline
3: normal blinking underline.

Now, the type of cursor used is controlled by the value of memory location 277 (&H115 in hexadecimal). You can experiment with this by changing the cursor type using the LOCATE 0,0,x command and seeing what effect this has on this memory location using PRINT PEEK(277). Next you may want to POKE some different values and see the effect this has on the cursor. For example, try POKE 277,60. This should produce a half-block cursor, not possible using the above LOCATE options.

Table 1 gives a list of some of the MB-6890 memory locations you might want to PEEK at for information and which you might want to change by POKEing. However, a word of warning: the operating system is quite complex and changing one system variable may create a conflict elsewhere. For example, changing the starting location for user BASIC programs by POKEing a new value into locations 29 and 30 will not move the other related pointers or move your actual program. The results are unpredictable and the system will probably get hopelessly lost.

My source for most of the information in Table 1 is 'Peach ROM Notes', by Bruce Rossell and Howard Viccars. It is available together with recent updates

Table 1. Useful MB-6890 memory locations.

Location(decimal)	Information stored there in hexadecimal.
29 + 30	Start of user BASIC programs.
31 + 32	Start of variable storage area.
33 + 34	Start of array storage area.
35 + 36	Start of free space.
37 + 38	Start of string space.
43 + 44	Top of string space.
139	BASIC error message number (=ERR)
140 + 141	Line number of the last error (=ERL)
147 + 148	ON ERROR pointer.(points to memory location)
163 +164	Start of current screen page.
165 + 166	End of current screen page.
180 (B4)	Program protect flag. (0 = unprotected)
277	Cursor type flag.
279 + 280	First line number which cannot be listed.
283	Default disk drive number + 128
328 + 329	Go address from last LOADM or EXEC.
460 + 461	Pointer to start of PF keys storage.
534 - 539	BASIC's time - one byte per digit. (=TIME$)
540 - 545	BASIC's date - one byte per digit. (=DATE$)
584	Value of last NEW ON x.
632 - 887	BASIC's 255 byte command line.
984 + 985	Top of available memory.

from The Software House, P.O. Box 70, Weston ACT 2611, for $28.00.

The information relating to protection locations did not come from the ROM Notes and perhaps requires some comment. After I discussed the UNLIST command in an earlier issue, I received a number of letters on the topic of program protection and on making information available about protection.

My view is as follows: anyone who has purchased a computer is entitled to know all about its operation and its capabilities, including how to protect programs from casual observation or modification. Computer owners are also entitled to know how to undo this protection, since otherwise they could not modify their own programs subsequently.

This does not mean that I encourage software piracy – far from it. If there were less piracy, software might be more reasonably priced – and if software were cheaper there might be less piracy; a real chicken and egg situation. However, there are better ways to protect software than to try and keep details of the operation of the MB-6890 secret, so I have included information about protection locations in TABLE 1.

Once a non-zero value is POKEd into memory location 180 you can no longer LIST or modify the program. PEEK and POKE will no longer work, so you cannot undo the protection by POKEing zero into location 180. There are several ways of recovering from this. The simplest method is to go into the monitor by typing MON + RETURN followed by M B4. The monitor will respond by giving the current contents of B4 (hex), which can then be modified by typing the new value (0 to undo the protection) + RETURN. To return to BASIC enter Ctrl D.

Big Brother

The big brother of the MB-6890, the new 16-bit machine from Hitachi, was to be known as the 'Success'. I was able to play with this machine for a couple of days by courtesy of Computer Cellar of 136 Maitland Road, Mayfield NSW, Newcastle's Hitachi (and other computers) dealer, and subsequently for a longer period by courtesy of Computer Innovation Group Pty Ltd of 11/263 Alfred Street North, North Sydney, who are the NSW distributors.

The MB-16001 comes in three parts. The main unit contains the main circuit board, slots for additional boards, a speaker, a parallel printer port, an RS232 port, two slimline 13 cm floppy disk drives and the controller for these. A nice feature is the clipboard front of the unit, which allows you to clip a sheet from which you are typing at a convenient angle and location. The unit is sturdy and can be placed well back from the keyboard.

The keyboard is attached via a flexible lead, which allows it to be moved easily for your comfort. When you are not using the computer the keyboard can be placed on top of the main unit to make the desk space available again. The keys feel slightly rough and seem to have less travel than on the MB-6890. This makes them appear to be closer together and at first resulted in more misstrikes than I usually get on the MB-6890. An improved keyboard with keys similar to the MB-6890 is planned and should be available by the time you read this.

The greatest asset of the MB-16001 is its colour graphics capability. The graphics display consists of 640 by 400 points and each point can be in six different colours, each at two levels of brightness. In addition there are white (two intensities) and black.

There are powerful graphics commands such as CIRCLE, LINE, DRAW 'string', PAINT and so on. In addition there are graphics GET and PUT commands, which allow you to GET a rectangular area from the graphics screen and store it in an array. You can then later PUT the array to another part of the screen and reproduce the original graphics.

Another new command is the PALETTE command. The colour code used by all the commands is stored in a look-up table, and the PALETTE command allows you to change the values in this look-up table. The result is an immediate change in the corresponding colour all over the screen. This can result in some very impressive displays. Finally, the graphics and text displays (16 pages of 80-character width) are independent, and a graphics page and a text page can be displayed simultaneously and cleared selectively.

One of the main differences between the MB-16001 and the MB-6890 is that BASIC is no longer stored in ROM but comes on disk. This has a number of advantages. It means that it will be much simpler to fix bugs (what bugs??) or make improvements, because all that will be required is to issue a new disk with the new version of BASIC on it. It is also much easier to make other languages available, and I understand that FORTRAN, Pascal and COBOL are planned to be available soon. I have in fact seen some literature saying they are available already, but my definition of available is that I can walk into any Hitachi dealer and inspect a copy.

For the moment we are limited to BASIC, so let's take a look at some of the differences. One is enhancements, which were not available on the MB-6890. Many of the above graphics commands are new, and you can now play music with a PLAY 'string' command.

It is now easier to send things to the printer, since we have LIST (to the screen), LLIST (to the printer), PRINT (to the screen) and LPRINT (to the printer).

However, if you plan to run some of your MB-6890 BASIC software on the MB-16001, you will have a few problems because of a number of minor differences. For example, many BASIC words on the MB-16001 require a space after the word. Thus FORJ=1TO10 will work on the MB-6890, but does not work on the MB-16001. It requires FOR J=1 TO 10. This is easier to read and takes up a little extra space in a LIST file, but there is no shortage of space in the MB-16001.

The token values for the MB-16001 are of course quite different, and the best way to get a program from the MB-6890 across to the MB-16001 is to make a LIST file on disk and then send it across via the RS232 ports on the two machines.

This leads me to mention another difference between the two machines: the standard RS232 port is COM0: on the MB-6890 and COM1: on the MB-16001. Similarly we have LPT0: on the MB-6890 and LPT1: on the MB-16001. There are no doubt many other minor differences, but many of them can be edited out rather quickly.

BASIC on the MB-16001 runs faster, as you'd expect, but the exact increase in speed depends on what you are doing. I did not have time to run the standard benchmarks, but here are some of my impressions. There is no increase in the speed of printing on the printer, since this is controlled by the printer. Screen prints seem to be about 50 per cent faster, while simple loops are about 15 per cent faster on the MB-16001. On the other hand, I calculated EXP(38) 1000 times and found it to take 3.5 times as long on the MB-6890 as on the MB-16001. The exact increase in ▶

HITACHI

speed therefore depends on your program.

'Success'-ful Manuals

The quality of the manuals with the MB-6890 have always been a sore point for many users, and it was the difficulties I had when I first bought my machine which started me writing about the MB-6890.

When I had my first look at the MB-16001 it came with some draft manuals prepared by Delta. Hitachi has now produced a set of three well-printed and good-looking manuals in looseleaf three-ring binders. These manuals are clearly based on the Delta drafts, with the result that the English is generally quite good. Some of the same errors and omissions still occur and some new ones have been added (like the mention of the SHIFT key without the F!), but all in all it's a major improvement over the MB-6890 manuals. However, further improvements are certainly possible and I have offered to edit them and suggest improvements (for a small fee, of course).

One major criticism is the use of two alphabetic sequences for the BASIC words, one covering commands and the other covering functions and system variables such as TIME, DATE, ERR and so on. In my view the only useful sequence is a single alphabetic one. The user should not have to know that PEEK will be found under functions and POKE under commands. And what about SCREEN? There is a SCREEN function (which returns information about the currently displayed screen) and a SCREEN command (which sets the screen mode and page).

Since I am naturally curious I checked out some of the BASIC words and found a few not mentioned in the manual, such as KPOS and KLEN (any suggestions?) and LCOPY (copy the screen to the printer?). I don't know whether these are omissions in the manual or bugs in the BASIC, like WHILE and WEND in the MB-6890 BASIC.

All in all, the MB-16001 is an impressive machine at an attractive price, and if the suppliers can get their manuals and software act together it should compete well with the other 16-bit machines. In particular, they would do well to publish a list of software written for the IBM-PC which will run on the MB-16001. I hope to report on some comparisons with the IBM-PC and on software compatibility with it soon.

P.S. I have been asked to pass on the following invitation:

The membership of the Peach Computer Users' Group Queensland invites MB6890 owners/users to join their group, which meets at 7.30 each fourth Tuesday of the month at Taringa Primary School, Morrow St, Taringa, Brisbane. The group offers a software library, tech. sheets, advice, support, and so on.

Contacts: Leo Burke, Pres: (07) 356-6080; Glen Thwaite, Treas: (09) 398-4341; and correspondence to Brian K. Williams, 19 Patrick St, Norman Park 4170; also Australian Beginning Username WILLPATRNORM. ❑

READER'S CARTOONS

Sir . . . I think the computer just made a mistake. It just sent 15 tonnes of unsalted pork to the Jewish synagogue . . .

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your MICROBEE computer

By Richard Pakalnis

HELLO AND WELCOME BACK. I trust you enjoyed the Christmas break. I certainly will (did). We work two months in advance here, you know. So back to work and the first thing I want to say is goodbye.

Goodbye?

Yes, it's so long, folks. My duties and responsibilities here at *Your Computer* have grown somewhat and it has become difficult to give my best to both the column and the magazine proper.

As I said last month I wish to thank all those who have involved themselves in one way or another and made this column what it is.

Thanks

So what happens now? Have no fears, my friends, for I have asked Mike Newnham (he has appeared on these pages before) to take over. Mike knows his stuff, and it's time we all took a step up in our ever-continuing microcomputing education.

Mike doesn't know of my plans yet, but let's keep that between us, shall we?

Competition

The Sydney MicroBee Users' Group is having a competition to find useful application and demonstration programs for the Bee. First prize is a green screen monitor from Jaycar Electronics, and winners in each section will receive one of the superb Mytek programs to the value of $25.00. Further prizes will be announced later.

Programs entered will become Public Domain and will be offered for publication in this magazine, *The Beeline* and other User Group magazines.

The competition is open to anyone, but winners who are already members of S.M.U.G. will have their subscription fees to the group refunded instead of receiving a prize. The competition will close on the last day of February 1984. Final judging will take place at the S.M.U.G. meeting in March.

Programs are to be well sprinkled with helpful REMs and should be easy for a beginner to understand. Programming style will be taken into account (FOR – NEXT loops to be indented and so on). Sections are:

1. Graphics demonstration program.
2. Music demonstration program.
3. A simple (but interesting) game.
4. An application program – simple but useful in the home or office.
5. Miscellaneous section – a program which does not fit into any of the first four categories.

You can send your entries to:

C/- Colin Tringham
6 Tunks Street
Waverton 2060.

P.S. Copies of *The Beeline*, the official newsletter of S.M.U.G., are available for sale from Jaycar/Electronic Agencies and Applied Technology (Waitara) at $2.00 a copy. Take my word for it, you will not get better value for money.

Tsk. Tsk. Still No Disk!

Well, there are some. Applied Technology have recognised the need for the supply of their programs on disk, but will start with limited quantities.

For those of you who have waited far too patiently for programs on disk and those who wrote and complained – take heart. This month we'll see the Top Ten programs on disk, selling for around $19.95 each. It's a small start, but it is a start. The following months will see more and more releases. The sooner the better I reckon.

Talking Software Review

Mike Newnham has reviewed Beetalker and Support Software, a speech synthesis package for us. He writes:

A computer can control a robot arm to move its own pieces in a game, it can respond to human speech and even speak to us in turn. Manipulators and speech recognition hardware are probably out of reach of most hobbyists at the moment, but it is now possible to provide your computer with a voice for a reasonable cost.

Many MicroBee owners have probably experimented by now with the pulse width modulation technique used to enable the Bee to perform as a digital 'tape recorder'. This process involves the digital sampling of human voice and storing it in memory. All this stored data is then used to turn the inbuilt speaker on and off to produce the recorded speech. The limitation with this method is that to achieve reasonable clarity, a very high sampling rate must be used. A few seconds of speech will use perhaps 16K of RAM. Reducing the sampling rate reduces the amount of memory used up, but also tends to garble the output.

An alternative to this method is to use one of the speech-synthesis I.C.s on the market. All you need is the speech chip, some support hardware and software and you are up and running with machine voice. If you'd rather have computer speech without going to all that trouble, there are ready built devices available. At this time, the cheapest by far is a device called BeeTalker.

Designed to plug directly into the parallel port on the MicroBee, BeeTalker comes assembled, ready to use and with a manual for only $99.00. It is manufactured and marketed by Robotron, the people who gave us BeeThoven.

Unlimited Vocabulary

BeeTalker reproduces speech by building up words from devices called allophones, which are just speech sounds like 'th', 'ch' and so on. The manual explains these in excellent detail. The BeeTalker vocabulary is unlimited and will say anything you tell it to. The quality of speech reproduced is a far cry from those earlier devices with heavy American accents.

For some time, the Votrax synthesis IC was the only readily available device for the hobbyist and cost around $69.00 for the chip itself. BeeTalker uses a more recent chip, the price of which enables BeeTalker to be sold for only $30.00 more for the whole package. Having heard speech from both devices, I have to say they are both clear and understandable, but I believe that the BeeTalker is less mechanical sounding. There is no drawl and the words are pronounced crisply and clearly.

The documentation provided with Beetalker is first rate, consisting of a 44-page booklet with clear instructions and detailed explanations, to help the user master the techniques required.

BeeTalker is backed up by two optional software packages. They are not necessary to make the device talk, but they make BeeTalker very flexible.

The first of these programs is the Speech Development Program, a menu driven speech editor which allows you to build up words and sentences using all the allophones available. With a movable cursor, the user selects sounds to be incorporated in a phrase. Speech created using this program may be saved on tape in one or two formats. The first of these creates a file of allophone data for later use with the program. The second format creates a file of BASIC DATA statements with the speech variables saved as variables in the DATA statements. This file is reloadable from BASIC. It is possible to load

the Development program into your machine, exit to BASIC, load the file and have the BeeTalker pronounce the speech data using a simple BASIC program. The Speech Development Program is available for $29.50 and provides a fast and easy means of experimenting with computer speech.

The second program is Bee'n'Talk. This differs from the Development program in that it translates written text into speech and will pronounce numbers up to 99,999. The user types in his sentence or short story and sends it to BeeTalker by pressing RETURN.

Bee'n'Talk is a very clever program. For instance, it will discriminate between words such as 'bough', 'cough' and 'though'.

Most speech is pronounced correctly from normally written words, but there are some limitations. Considering there are about half a million words in the Oxford dictionary, the range of allophone permutations is extremely large. To have Bee'n'Talk pronounce them all correctly would require more memory than the MicroBee has available. Hundreds of words would have to be tested individually, since they don't follow common rules of pronunciation. An example is 'MACHINE' which has to be spelt 'MASHEEN' to sound right. Everyday speech is no problem. Bee'n'Talk handles it quite well.

With Bee'n'Talk In Your Machine

With Bee'n'Talk loaded in your machine you can exit to BASIC and assign BeeTalker as an output device. Type in OUTL 6 and all subsequent LPRINT and LLIST command data will be passed to BeeTalker via Bee'n'Talk. In other words, program output will be spoken. BeeTalker will verbally list a program. There are some surprises too. Characters such as ( ) + − / and others are voiced as 'open brackets' 'closed brackets' and so on. Since the device is pronouncing the text, it will utter nonsense when it encounters CHR, for instance. On the whole the verbal listing of a program is clear and understandable.

At $49.50, Bee'n'Talk is not the cheapest program available, but it does a lot of work and is well written. It allows you to make BeeTalker say just about anything you want. A program with one of the silicon psychoanalysts having its output passed to BeeTalker would certainly be an attention getter at a party. BeeTalker and its support software extend the capabilities of the MicroBee in an exciting direction, without the need for a large financial outlay.

While the device certainly has novelty value, there are practical aspects also. The computer is able to attract your attention by speaking to you. It can announce its moves in a game and voice is certainly more effective than beeps, to signal events occurring during the running of a program.

Review Summary

Review products came from:
Robotron
PO Box 232
Mooroolbark 3138.

Bee'n'Talk is available only from Applied Technology. ❑

By Rod Stevenson

REGULAR READERS may think my repetitions are an indication that I've nothing more to impart. Not so: the reason is that newcomers haven't seen my earlier words and they keep asking the questions we all did as newcomers.

So, I repeat my advice not to disregard the tape recorder after the program has finished loading. As well as leaving the capstan roller under pressure, thus possibly creating a flat spot on it, there is the point that when the tape stops the program will still be directly under the head. This means the piece of tape exposed will have data recorded on half of it, and the piece of tape still around the right-hand guide post of the cassette will have data too. If this tape is left in such a position, particularly under the tension which results from not pressing the stop button, there will be a 'kink' formed in the tape by the guide post.

This will flatten out of its own accord with time, but surely it's wiser not to let it happen in the first place? All that's necessary is to rewind the tape after use. This is one reason for the leader provided on tapes; it makes one wonder why so-called 'data' tapes are made without leaders.

Again, let me push the results of my own experience and say that I've had the most consistently good performance from TDK-D cassettes, not with the special data tapes. Indeed, I've had some very poor results with some of the expensive data cassettes. What was worse than a poorly recorded signal was the propensity for some of them to lose their recorded data over a short time.

Those readers who think all their problems will be solved by resorting to a disk system would be well advised to read my earlier columns for a more complete coverage of the mechanics of successfully using a tape system – or send me an explanation of the problem with a stamped, self-addressed envelope for the reply.

There are reasons for using a disk system (mine is), but the thought that it's the only way to achieve reliable storage is an erroneous one. I don't know one person who's not lost data from a disk - certainly there's always a reason, but there is with tape losses too.

Printing Nothing

A few issues ago I pointed out that some printers require an LPRINT" rather than just an LPRINT, and others require an LPRINT" " to perform a line feed. From the feedback I've received (and I'm always pleased to get feedback in any form) it's obvious I should have added that the real answer is to do your own experiments and determine for yourself what your printer needs. Having found a set of rules, they will remain the same rules of use for every program you write.

This is also true for the question of when a semi-colon is needed to format screen output in the printing of string variables, string literals, and numerics.

While I'm happy to answer letters seeking help, I do think little tests like these are part of the fun of programming. Particularly as, unlike hardware problems, once fixed and understood the problem won't return.

Hardware Problems?

From the last sentence readers may infer I've recently been plagued to some degree by hardware unhappiness. It's true. Some even suggest that just as dogs can sense when their victim is afraid of them, so the little black things with the silver legs can sense me!

Having got through the latest burst of attempts to intimidate me, I'm pleased to be able to report that it was all overcome by logic – and by belonging to a users' group.

The significance of this last is not that I could simply give it to a hardware expert to fix (what reader would be cynical enough to think that of me?), but that I could locate from the membership list a member with an identical system and take the whole lot around to his place and set about exchanging pieces one-by-one until all was proven. The problem turned out to be the floppy disk controller: it would work in another system, but not in mine. I can only assume a sensitive current requirement or some other devious fault.

Yes, I know I could have taken the whole lot in to Tandy to be fixed, but although they've now relaxed their rule about servicing/repairing any modified equipment (mine has in-keyboard memory and a 'foreign' lower case modification), I can't feel happy that they would not just assume the fault was in the modifications (which it wasn't), and charge me to say so. It may be an injustice to Tandy, but the stories I've heard of their repairing attempts don't fill me with confidence. Not that they're alone in needing more than one attempt at repairs in the computer-field.

Failed Memory

The other hardware fault I've had recently with my Model 1 was a failed memory chip. As I have my memory in the keyboard I'm wondering if this is a good technique, since this is the fourth chip to fail. Two have been the original Tandy 16K, and two have been the additional chips. The question is whether the claim is valid that the extra heat generated is causing the problem.

However, I know many others who've done exactly the same to expand memory and have yet to experience any problem at all. I've even read that it makes for a more reliable system because the memory is all together in the keyboard without the connecting cables there would otherwise be, and the memory is not near the power supply as it was in some models of the expansion interface.

I'll be happy to include in a future column any results readers would like to pass on regarding success or problems with in-keyboard memory on either a Model 1 or a System 80. While I do know many System 80 owners who've added 32K in their keyboard, I also know those who've added only 16K because they are positive it can't cope!

Detecting Failure

Perhaps I should say that one can become particularly upset by a failure in the first 16K of memory. The system may not initialise. One is apt to assume the worst.

Or the chip may become heat-sensitive, so all is well for an hour until things go crazy. Then there seem to be DOS errors, or a huge variety of different symptoms – a totally blank screen is somewhat frightening. If it is a heat problem, the patent memory test programs don't seem to help, since they can't be expected to indicate a fault before it develops, and after it develops you can't load the memory test program. So the test seems to be to heat the chips with a hair dryer until they go faulty, then isolate the faulty one with freeze spray. At least, this is the only way I could find success.

It's Worth Gold

For around $25 one can buy a strip of gold edge connector contacts to treat a Model 1 or a System 80. I too have seen the comments in the American TRS specialist magazines that there's

no need, but if you are experiencing spontaneous reboots, or 'sudden death' (dropping back to Mem Size), or a number of other effects you may not immediately associate, I can assure you it's worth the $25 investment. As proof, just try cleaning the contacts and see whether it makes a difference. The cleaning will last only a week, but you will have found the cause.

On this subject, it's worth saying that many hardware faults are mechanical rather than electronic – such as the cable which has been unplugged so often it has almost, but not quite, come apart, thus making an intermittently faulty contact. Or the socket that's a bit loose and falls out just with the vibration of people walking into the room – don't laugh, my disk controller chip fell out of its own accord!

LDOS Hint

I'd expect that most people have their LDOS configured to use printer and keyboard filters, minidos, verify and so on. But what's not obvious unless you think about it is that your configuration is set up to save the nominated files in high memory; it will not work on a system with less memory.

So the answer to the apparent lack of portability is to hold down the clear key to stop it configuring.

Admittedly this is probably not often a problem, but when it is, you may be glad I mentioned it and made you think about the ramifications.

Money Back Guarantee

I've recently heard some sad stories of hobbyists buying a piece of equipment to connect to their system, getting it home, and finding it won't work on their particular unit because of an undocumented model change. The sad part comes when they try to return it and get their money back.

Whatever the legalities of the situation, some sellers refuse to accept returns for cash in the case where the unit is not actually faulty, just incompatible. So the obvious advice is to make certain you will be able to return the goods if they won't work, not just if they're faulty.

Of course, none of the big-name chains can afford to damage their reputation by such action, and it may be that your local consumer affairs department will be able to rescue you, but it's better to find out first.

Finding Out About DOS

A question to which I've not yet found a satisfactory answer is where to get an understanding of the workings of disk operating systems in the same detail that one can get into the plain level 2 system.

Part of this is because the level 2 operating system is standard by nature, whereas because of the number of disk operating systems available there is enormous ground for no standard.

Certainly the LDOS manual has a technical section, but it is very advanced, and of limited content anyway. The IJG books (there are two dealing with TRSDOS) will add some understanding at the cost of many hours puzzling and deciphering to make the information general enough to gain a non-specific understanding. But nowhere have I found a comprehensive and non-contradictory work such as the various ROM manuals available for level 2.

I suppose many will consider they don't need to know as long as it all works, and that's fair enough – for them. But I've enjoyed understanding the workings of the level 2 system, and from the number of readers' requests I get for recommended texts on the subject, I know I'm not alone in my wish to have the same level of understanding of disk operating systems.

I don't mean I want to know what is meant by such separate mysteries as DAM, HIT, FCB and so on. What I'd like is someone to tell me, so I can pass it on to others, the source of the ultimate and full understanding of how a DOS (in general) does its thing. Please write.

Undocumented Facilities

I understand the manual that comes with the Model 4 TRSDOS (actually LDOS 6) doesn't document all the facilities that are actually present. They're the same ones that are in LDOS 5; so if you miss your favourite, try it and see.

This seems good advice in many cases: if unsure, try it – although you may find yourself in trouble if carrying this principle to extremes. ❑

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Destroyer: A fast-moving action game for the Microbee. Destroy all the buildings and land your ship without crashing. Price $12.50 plus $2.50 p&h. Cheng Wah, 74 Moore Street, Fitzroy 3065. Cheques etc payable to G A Taylor.

Microbee Owners: I have produced a handy wall-chart (850 x 600) which contains a number of essential items necessary for all serious programmers, including a 64 x 16 curs and screen poke format with all poke locations added, a comprehensive memory map, the complete ASCII character table, and a complete graphics layout. Only $9.50. This includes postage. To J Kocka, 14 Tanahmerah Avenue, Tanahmerah 4128.

Wanted: Need info on NEC 8001B. How to expand memory; software, anything of interest. M Brown, 5 Baring Street, Mosman Park, Perth 6012. Tel (09) 384-6698.

Microbee: 32K, EDASM and WordBee (switch selectable), 'Ritron' green phosphor monitor with Bee power supply built in, Sharp cassette player (1200 Baud no worries!), heaps of games etc. on tape. Cost over $850. Sell $650 or offer. Phone Andy Hardy (045) 70-2184 bh.

Maps and Hints: For Microsoft Adventure (including the mazes) $10.00. P Klemencic, 21 Bayswater Road, Moonah 7009.

Sinclair ZX81: 16K RAM, with 10 program tapes and some books – $350 ono. Phone (02) 527-1154.

For Sale: Printer for TRS80-PCI and Sharp PC1211 pocket computer, all accessories included. $95. Frank Rees, 27 King Street, Boort 3537.

Microbee Owner In Kingaroy: Wishes to contact others in the area. Phone (071) 62-3219.

Replay II: Apple copy cards, $180. Copies software from memory without parameters. Places in DOS 3.3 file. 3AA Apple Computer Catalogue, 200 pages of Apple hardware, software, at discounted prices. 300 public domain disks, $4.00. Hex Computing, 17 Irvine Street, Peppermint Grove 6011. Phone (09) 384-9043.

IBM & Columbia Users' Group: Meets on every second Tuesday night of each month at 7.30 pm at the Victorian College of Pharmacy. All IBM-PC compatible computer owners are welcome. For information contact Giles Bray on (03) 82-7632 ah.

ZX81: FM 1.2 amp power pack, leads, manuals, programs etc, $120. Also 16K RAM for $80 plus many constructional articles. F Papadopoulos, 13 Kroombit Street, Dulwich Hill 2203.

For Sale: Sinclair ZX81, 16K RAM, ZX printer, plus $200 software. As new. Cost price $650. Will sell $450. Phone (068) 62-1574.

Kaypro User Group: Sydney area; anyone interested in forming a group please contact Harry on (02) 713-1585 evenings.

For Sale: Computer magazines in good order. Personal Computing, Kilobaud. List available. Phone (03) 848-5549.

How To Buy A Personal Computer: This book explains what you need to know and gives comparisons of 24 popular PCs. Send $6.95 Chq/MO to Ozway Consultants, PO Box 1639, North Sydney 2060.

Microbee: Printer's Mate permits the Microbee owner to make full use of a dot matrix printer. Machine language facilities provide graphics screen dump, text screen dump, memory dump and page formatting. Available for Itoh 8510, Epson RX and FX, Epson MX and the new MX-like printers, Amust 80DT, Admate DP80, CP80 etc. $16.50 includes documentation, packing and postage. Icarus Software, 8 Maplin Place, Rossmoyne 6155.

For Sale: Apple arcade games – Snakebyte, Apple Panic, Pacman and Bug Attack. $25 for the lot. Must sell. T Stephen, 68 Rous Road, Lismore 2480.

Brisbane PC1500/PC2 Club: Meets every third Thursday at 7.30 pm, Kelvin Grove BCAE, Room E/315. All welcome. Phone Chris (07) 395-1952 ah.

Own A VAX?: Want to read 8" CP/M floppies? CPMFloppy – $200 from Computer Applications, PO Box 119, Innisfail 4860.

Wanted: 8 inch disk drives. Either 1 or 2 with power supply. Prefer SSSD but will consider better drives. Paul Shields, 2/39 S.M.Q., Dampier 6713. Phone (091) 83-1724 (ah), (091) 83-1000 (work).

Microbee: Stat-Pack – a graph plotting, regression, correlation and significance testing program. Tape with instructions $15 (includes postage). Specify 16K or 32K. T Wilkins, 57 Charles Street, Marrickville 2204.

16K ZX80 Software: ZX Monopoly (two players) $12.00; Tape Copier $9; Shape Table Plotter $9; the lot $25. Send to N Kefford, 120 Church Street, Yass 2582.

Original Games For The Apple II: Write for free catalogue, Ban-Pit, 79 Lakeside Avenue, Mount Beauty 3699. Phone (057) 57-2097.

Urgent Sale: Casio FX-702P Pocket Computer + interface + printer. Hardly used. Retail $410. Sell $200. Contact Patrick Mead, 9 Myagah Road, Ashgrove, Brisbane. Phone (07) 38-1501.

Wanted: ZX80 for under $40 (including adaptor and manuals). Post replies only to Matthew Croft, 31 Addison Road, Black Forest 5035.

For Sale: Printer, IDS440G Paper Tiger with dot graphics option, home use only, $500.00 ono. Phone (049) 57-2379 after 6 pm.

Wanted: 80 column card to suit Osborne 1 computer. Cairns Computer Centre, 205 Mulgrave Road, Cairns 4870. Phone (070) 51-8010.

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VZ200 Software: 'Home Finance Package' is a menu-driven program for the VZ200. Home budget, investment, personal loans, mortgages. All this incorporated in the one program on cassette. Excellent value at $11.95 plus $1 p&p. Write now to K Hunter, 5 Yatama Court, Werribee 3030.

Commodore 'Microcomputer Printout' Magazine: Jan 1981 – Sept 1982 $10.00. 'Compute!' magazine 50 cents each. 6502 Assembler Tutorial and Book (Scanlon) $10. Programming The PET/CBM (West) $10. PET/CBM Guide (Osborne) $7. BASIC 4.0 In-depth (Microsoft) $5. CBM software, adventures, games. (03) 277-5089.

Wanted To Buy: For TRS-80 Model 1. Copies of RSMZD monitor incl documentation, and documentation for Radio Shack's Editor Assembler. P Klemencic, 21 Bayswater Road, Moonah 7009.

Write off Theft: Protect your micro, video etc. With the revolutionary marker pen, invisibly mark your telephone number or other identifyer. One pen will identify most items in your home/school/company. Only readable with a U.B. light. $8.50 each. Frazer Electronics, P.O. Box 485, Ringwood, Vic. 3131

System 80: Has 16K memory, monitor, printer interface, games cassettes and touchtype instruction cassette – great value at $440 ono. Phone Michael on (02) 450 2098.

Apple II +: Expansion cards. Digitek Pal colour encoder card – $175. Digicard 80 column card – $190. Ring Lesley, 9 am – 5 pm, on (03) 698 9210.

For Sale: Microbee, 16K with books and software, also connector for B/W TV. Good chance to buy popular computer. Phone (051) 54 1057.

Atari Software: Wanted to exchange. Send

me a list of what you have and I will send you my large list of games, utilities and languages. Karl Rasmusson, 47 Curtis Street, Toowoomba 4350.

Vic 20: Plus datasette and software worth $300. Monitor and printer and 32K Ram Expansion plus manuals. Worth $1650. Sell for $1200 ono. Will split. Phone (053) 39 4491.

Apple II: Brand new 16K language card ($100 ono) and joystick ($30 ono) for sale. Phone (052) 43 5949 between 6 and 9pm.

Apple II+: Complete system with disk drive and controller, Kaga green hi-res monitor, 16K RAMcard – $1795. Phone Chris on (03) 592 1968.

Printer: Dick Smith GP 80 (Seikosha) 30 c.p.s. Dot Matrix – $200. Phone after hours on (02) 74 8258.

Black And White Monitor: Currently used with a MicroBee, will suit most other computers. Sells for $150.00, you pay only $75.00. Phone (03) 459 3327.

Atari Video Computer System: Good condition, with paddles, joysticks and Combat and Space Invaders cartridges – only $120 ono. Phone Peter on (02) 639 6619.

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All New TRS-80/System 80 Games: Moon Scout, The Gladiator, Neutroid and Stellar Odyssey are selling fast! For free catalogue write to Fun Division, 61 Cremin Street, Upper Mt Gravatt 4122.

Sharp RS232: Suitable for the PC2/PC1500, 3 months old – $160. Write to P.O. Box 66, Mosman Park 6012.

Sinclair ZX81: 16K full-sized keyboard, all leads, BASIC and Machine Code manuals, book of programs, some software – $250 ono. Phone (03) 781 5496.

16K ZX81 Software: ZX Monopoly $12, Shape Table Plotter $9. Tape copier $9. The lot – $25. Write to N. Kefford, 120 Church Street, Yass 2582.

MicroBee: 32K with Edasm and Wordbee in ROM (switch selectable!) and Microbee cassette deck, plus many program tapes and books. The lot – only $425 ono. Phone Andy Hardy on (045) 70 2184 bh.

Apple II: Two disk drives, Monitor, stand, Wordstar and CPM– $3200 ono. Seikosha GP 80M Dot Matrix printer and interface – $250 ono. Olympia ES 100 Electronic typewriter/printer and interface – $1800 ono (retails for $2300). All items could be delivered and installed. Phone (02) 407 3033.

Intel Multibus SBC: Type 86/05(8086 processor). Still in original packing, with manual – $1100 ono. Also, 8087 Maths Co-Processor $400, GPIB interface $400. Ideal system for number crunching. Phone D. Phillips on (085) 22 3132 ah or (085) 27 2190 bh.

For Sale: Approx 18 issues of Micro-80, and ten tapes to match ten of the magazines. Job lot only, not individual mags/tapes. $50 ono. Phone (054) 26 1836.

Green Screen: Want the best? Like to save almost $100? Kagadenshi high-resolution 12" monitor with circuit diagrams – a sacrifice at $200. Please telephone (02) 579 6867 (evenings) for inspection at 27 Roberts Avenue, Mortdale 2223.

Microbee Quality Software: "Accounts Manager" provides a full set of records – ideal for those using a taxation accountant. Can handle up to 32 separate accounts. Easy to use. Suits popular printers. Data save and load. Instructions, tape and postage – $15. Mail order to B. Proctor, 27 Roberts Avenue, Mortdale 2223. Prompt return guaranteed.

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Apple II: Disk drive and controller and 16K RAMcard – $350. Phone David on (042) 61 5859.

Tandy: Expansion interface 32K – $450. Line printer VIII with cable – $550. Both 10 months old. Phone (02) 674 1317.

Sell Floppy Disk Drive 1: Meg Shugart SA 850/851 DSDD STD Shugart SA 800 I/O Compatible IBM 3270 Format or Hard Sector Compatible, new in box – $390. Phone (047) 59 1721 after hours.

Modem: Direct connect 300 baud – answer/originate unused, still in carton, plus ASCII express software – $1800. Phone (02) 337 2598 bh, or (02) 371 6026 ah.

Wanted: Cassette copy of same "Taipan" for 48K Model III TRS-80. Write to 115 McManus Street, Whitfield, Cairns.

Sell or Swap: Programs for the Apple II. Send a disk with $5, or with programs. Nicholas Lunn, 28 Lee Parade, Leongatha 3953.

Microbee Printer's Mate: Permits the Microbee owner to make full use of a dot matrix printer. Machine language facilities provide graphics screen dump, text screen dump, memory dump and page formatting. Available for Itoh 8510, Epson RX and FX, Epson MX and the new MX-like printers Amust 80TD, Admate DP80, CP80, FAX80 and so on. $16.50 includes documentation, packaging and postage. Icarus Software, 8 Maplin Place, Rossmoyne 6155.

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3A Apple Computer Catalogue: 200 pages of Apple hardware and software at discounted prices. 300 public domain disks – $4.00 each. Hex Computing, 17 Irvine Street, Peppermint Grove 6011. Phone (09) 384 9043.

Brisbane PC1500 Bit Fiddlers Club: Meets 7.30 pm every third Thursday at Kelvin Grove BCAE, room E/315. All owners of PC1500/PC2 as well as owners of other handheld computers are welcome. Phone Chris (07) 395 1952 after hours.

Computer And Video Exhibition: Portland Civic Hall. 28 – 3 Feb 1984. Exhibitors wanted. Ring (055) 23 2671 during business hours and (055) 23 3729 after hours.

TRS-80 Software: Armoured Patrol, Penetrator, Flight Simulator, Asylum and more (some disk). All original, with packaging. For details phone (053) 82 1804.

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Apple Software: For sale at factory prices. Please send large self-addressed envelope to B. Knott, PO Box 3109, Alice Springs 5750.

For Sale: Vic-20 datasette, extra 8 and 3 K expanders and expansion board, 2 cartridges and tape – $550 ono. Phone (003) 94 7263.

Hitachi Peach: 32K RAM — $900; M.P.I. DS/SD drive plus controller card — $550; Kaga green-screen monitor — $150; Star DP8480 dot matrix printer — $350. As a system — $1900 ono. Includes cables, manuals, some programs. Phone (063) 63 1615 (ah), (063) 63 1500 (bh). Peter Farmer, 28 Ross St, Oberon 2787. ❑

your KAYPRO computer

By Jeff Richards

AT LAST there is a Kaypro user group in Australia. A number of Victorian users have formed the Kaypro User Group of Victoria, and they can be contacted at PO Box 159, Forest Hill 3131. This is the first user group I know of, but if there are any others out there I would like to hear about your activities.

Printing Large Files

Secretary of the Victorian group, Stephen Foley, has sent a copy of the KUGVIC bulletin which contains a wealth of interesting material on the Kaypro. I particularly liked a tip from Michael Stocker for Perfect Writer users trying to cope with large files. As a general rule you should work with a number of small files rather than one big one. This saves processing time and increases the protection against disaster. When it comes to printing, however, it is often useful to be able to string a series of documents together for one print run. The @INCLUDE command allows additional files to be formatted in one pass, with all style parameters carried over from the first file.

If you tried to edit and format files on one disk the largest formatted file possible would be about 100K. To maximise the space available for the .mss files and the formatted .fin file, you need to arrange your disk space carefully.

The first step is to create a formatting disk by getting rid of the unwanted .COM files, leaving only PF.COM and PF.DAT on drive A. This leaves about 150K on drive A for the .mss files. As .fin files consume a little more space than .mss files, this will produce a file of about 160K which can be written to an empty disk on drive B. You can use up the last fraction of space by storing a .mss file of about 10K on drive B, which will push the .fin file to about 170K.

To force the system to write the .fin file to drive B, it is necessary to use the "rename" option. The command becomes A:PF –o B:name A:name.mss. Alternatively, if PF is invoked from drive B and the first file to be formatted is on drive B, then the .fin file will be automatically sent to drive B. Each INCLUDE command should explicitly reference the drive on which the .mss file is stored.

Michael mentions a limit of seven on the number of INCLUDEs, but I did not find this restriction. If in doubt, keep your document to seven or less parts.

Configuring PW For Special Printers

Several people have written about configuring Perfect Writer for special printers. The Perfect configuration routine only includes options for initialisation, reset, boldface and italics. The initialisation string can be used to distinguish between, say, 10 and 12 point type for printers that have this option. But how can you include additional options, like double-width characters for headings?

The easiest way would be to include the required command string in the text, but PW provides no means of entering sequences of control characters, such as ESCAPE. It is possible, however, to get such characters into a file. The trick is to create a utility file with character strings for the required functions. This can be read into a buffer and the required strings selected for insertion into the document. Such a file could be built with ED, which accepts most control characters, or directly from the keyboard with PIP, which will accept everything except CTRL-Z.

The idea sounds good, but doesn't work quite so well in practice. PF strips out all embedded control code sequences, so this approach won't work unless you print verbatim. It is possible that there are other options which prevent PF from removing the command strings, but I have not been able to find them.

An alternative is to utilise the options provided. For instance, if your printer does not support an italics mode, there is no reason why the command sequence for italics and the @ITALICS command cannot be pressed into service for some other function – for example, double width characters.

If you have not tried PFCONFIG yet, it is worth noting that the current values for defined printers are displayed when you attempt to edit an existing definition. If you have a printer that does not appear to be supported you should check the existing definitions to see if there is one that appears to match your printer.

Although they don't always advertise it, most printer manufacturers use a control sequence that conforms to one or more of a small number of established standards. This is particularly so for daisy wheel printers – if your printer has several alternate command sequences that appear to do the same job, it is almost certain one of them will be Diablo compatible.

Enhancing Perfect Writer

Another correspondent, Steve Keen from Sydney, has sent some detailed information about a Perfect Writer enhancement package called Plu*Perfect. This package contains some patches to Perfect Writer, a configuration program to build a larger swap file, some CP/M utilities and some patches to CP/M.

The PW patches correct a number of errors and add a number of commands, including the ability to reset the disk system, allowing disks to be changed without exiting PW. The numeric keypad can be programmed to produce any sequence of keystrokes and the display can be scrolled up or down a specified number of lines. This last change avoids the annoying difficulty of trying to get a particular piece of text centered on the screen.

CP/M enhancements include an interactive TYPE command, allowing forward and backward scrolling through the file. Additional CP/M utilities include a fast COPY, a multiple disk copy, and a sorted directory display. The whole package costs $US25 and can be ordered from Plu*Perfect Systems, Box 1494 Idyllwild, California 92349. It would be worth mentioning the Kaypro serial number and the PW version number when ordering, in case they have to allow for the different versions of the software.

dBase II Editing Tip

And finally, a tip for dBase II users. The Kaypro option on the configuration menu for full-screen editing does not set up the command sequences correctly for the Kaypro – it includes some unnecessary zero bytes.

The easiest way to fix the problem is to select the Kaypro option and go back to edit the codes that have been inserted. Each zero byte should be removed. For those options that the Kaypro supports this means re-entering the command strings without the zeroes. For options that are not supported (like inverse video) just hit RETURN at the first question to establish a null string. Once this is done full-screen editing on the Kaypro is very effective. ❑

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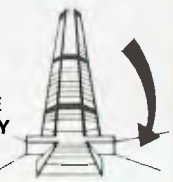

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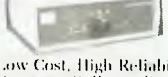

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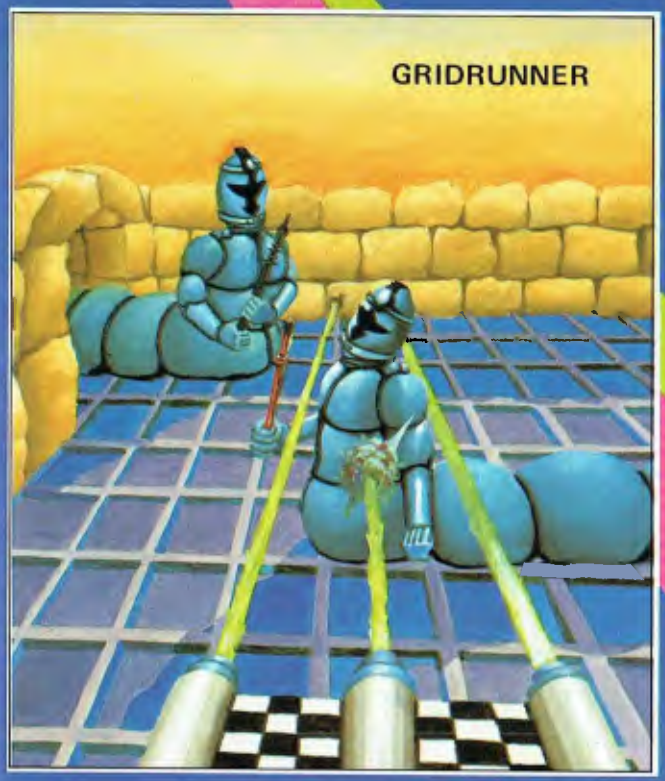

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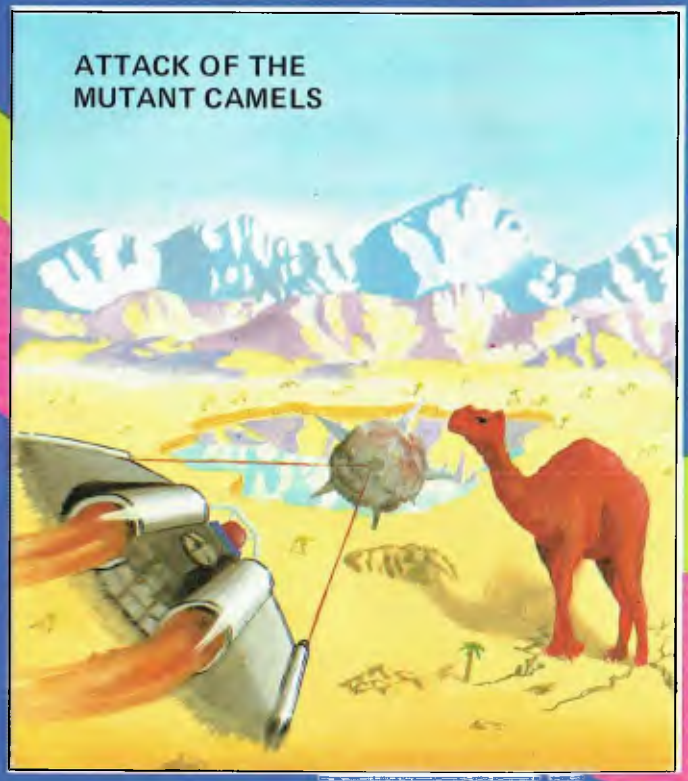

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