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The new Texas Instruments Professional Computer gives you more for the money.

Tear and compare.

Compared to the leading competitors, the TI Professional Computer gives you more for the money. Tear out this chart and compare. TI offers you:	TEXAS INSTRUMENTS PROFESSIONAL COMPUTER	IBM	APPLE
Two additional programmable function keys (a total of 12) for simpler, easier use.	✓		
Software for virtually every professional and business need.	✓		
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Three times more information on your screen when using graphics and text. (Superimpose graphics and text.)	✓		
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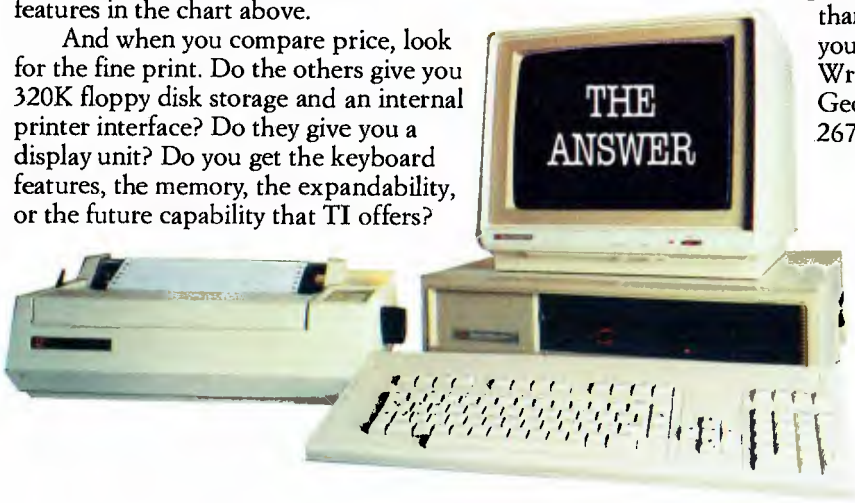
Separate numeric keypad, cursor control, and edit/delete keys for easy use and less chance of accidental data loss.	✓		
Superior expansion and future enhancement capabilities to prevent instant obsolescence.	✓		
Flexible upgradability to Internal Winchester disk drive with no modifications to hardware.	✓		
The ability to run the same software on the colour or monochrome monitor.	✓		
True multiuser capability via local area network.	✓		
Speech command capability.	✓		

When you're comparing personal computers, look carefully for the 12 features in the chart above.

And when you compare price, look for the fine print. Do the others give you 320K floppy disk storage and an internal printer interface? Do they give you a display unit? Do you get the keyboard features, the memory, the expandability, or the future capability that TI offers?



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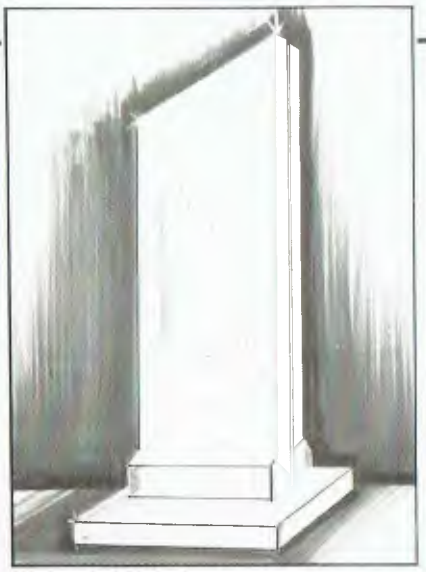
inside your computer



Your Computer's Personal Computer of the Year and Software Product of the Year Awards were presented at the Hyatt Kingsgate Hotel, Sydney, on March 29. Read who the winners were, who made the short lists, and which Australian contenders received special commendations.

Your Business Computer

Find out what really happened to Osborne Computer Corp; read about VisiOn, the latest software **smash**, and Tallyphone, **the all-**Australian computer system set to revolutionise the work of telephonists — plus assessments of Multitech's MIC-504 business system and DEC's Rainbow 100.

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Personal Computer Of The Year Awards

After the success of last year's Award, this year *Your Computer* is not only presenting an award for the best personal computer released in the last year, but also one for 'Software Product of the Year' — and there are two Special Commendations for Australian products.

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Club File

An updated list of computer clubs throughout Australia.

YBC

Your Business Computer

This month's *Your Business Computer* contains an in-depth account of what *really* happened to the Osborne Computer Corporation in the United States, plus a review of VisiOn, the revolutionary new software product. We also look at the Tallyphone, an all-Australian invention set to improve the lot of all switchboard operators, review the Multitech MIC-504 business system, and get a user's assessment of DEC's Rainbow 100.

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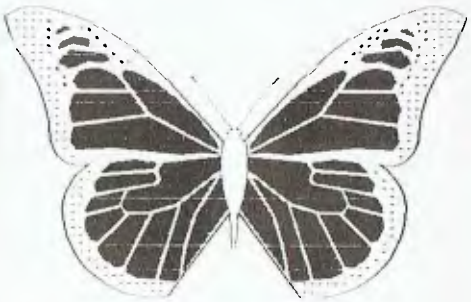
HP150 — The Magic Touch

User Report

A touch screen would seem to be a most natural and easy way to input your requirements to a computer, and according to Dom Swinkels the HP150 lives up to all expectations.



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The World According to Chuck Peddle

Called by some the 'Father of the Microcomputer', Charles Peddle gave Sydney journalists his views on the past, present and future of the microcomputer industry.

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Learning with the Tortoise

Peter Thacker, a teacher of com-

Volume 3, No. 9, April 1984

Audited by Audit Bureau of Circulations
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puter studies, wrote this program along the lines of 'Turtle' to provide readily affordable computer education on a VIC-20.

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Ultima II continues where Ultima I left off – and Glen Thornley reckons adventure freaks will simply disappear from normal society once they get their hands on this riveting game.

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Getting dBest from dBase Part VII
Part seven of this series initiates users into the writing of programs.

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Understanding Assembler Part XVI
In the last instalment, Les Bell looked at the macro definitions built into the MAC and RMAC assemblers. This month he investigates how to write your own macros.

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Your letters to *Your Computer*. Let us know what we're doing right (or wrong), ask other readers for help, air your pet whinge – just write to us.

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Popular Systems
Individual columns devoted to the more popular micros. This month's columns include the Microbee, TRS80, Kaypro, Osborne, TI 99/4A, Atari and VIC/C64 computers.

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Classified Ads
After last month's dearth – everyone must have got just what they wanted for Christmas — the classified ads are now back in their usual force. Anything you want to buy, sell or swap is here!

next month

May's *Your Computer* will feature articles on the latest in high-tech medicine, several unusual applications for micros and larger computers, and our usual in-depth equipment reviews. We'll also be looking at another exciting adventure game, 'Legacy of Llylgamyn', and continuing our series of tutorials – plus all the regular columns on individual micros.

your computer

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YOUR COMPUTER is published monthly by the Federal Publishing Company Pty Ltd. Printed by ESN-The Litho Centre, Waterloo NSW 2017. (Phone (02) 662-8888.)
Editorial and NSW advertising: 140 Joynton Avenue, Waterloo NSW 2017. Phone: (02) 663-9999. Postal address: PO Box 227, Waterloo. Telex: FEDPUB AA74488.
Publisher: Michael Hannan. Typeset by Hughes Phototype, Spit Junction NSW, Phone: (02) 960-2788. Distributed nationally by Gordon & Gotch. Registered for posting as a publication – Publication No. NBP4384. See back page for information on copyright, contributions, reader services and subscriptions.
*Recommended and maximum price only.
ISSN 0725-3931.

PROUDLY PRINTED IN AUSTRALIA

editorial

Is this Government serious about fostering a local software industry?

Once again, I turn your attention to the ridiculous situation concerning import duty and sales tax on software. In the last week, I have received two letters from readers who were concerned at the high rate of duty and tax payable on software they had imported from overseas.

Some time ago, Customs began to charge import duty on blank floppy disks (in order to protect the two local manufacturers of floppy disks). After a while, they noticed that people were importing software on floppy disks, and started to calculate duty on the value of the software, not the disk itself. It obviously suited officialdom not to be able to distinguish between the two.

For a while, people worked their way around this. Software distributors negotiated agreements to duplicate software in Australia using locally assembled disks, while individuals used tricks like importing a disk (value $2.00) and manuals (value $493.00) in separate packages and invoiced separately.

Now, however, the bureaucrats have decided to recognise the nature of software, and decided that all its value resides in or on the disk (although they are still slightly confused, as software bundled with hardware or on Winchester disks is still duty free). Those importing software are now faced with the following Customs Assessment (based on the example of a $100 software package):

Duty on package valued at $100 is $35. This is added to the value of the package, giving $135. This is then surcharged 20 per cent, as Customs assumes that by buying overseas you have avoided the retailer's mark-up. This gives a sales-taxable value of $162. Sales tax is now calculated as 20 per cent of $162, or $32.40, and added to the $35, giving a total of $67.40. This amounts to a tax by stealth of 67.4 per cent on imported software.

My point is this: the commonest software products used by consumers (such as word processors, accounting systems and so on) are generally duplicated onto floppy disks by local distributors and therefore do not attract this impost. The average computer purchaser is not suffering unduly from this legislation. However, the software developer requires specialised products – such as compilers, cross-assemblers, database management systems, ISAM packages and others, which are not distributed locally, and which therefore must be ordered from overseas. Thus it is our local software industry which is suffering, through being forced to pay a premium price for the tools of the trade.

The fact that Customs arbitrarily imposes a 20 per cent surcharge to replace the mythical retail margin on what are really industrial products generally only available from the original authors is merely adding insult to injury.

These various tributes and taxes have gradually been applied by the Customs Department itself quietly amending regulations and by-laws without telling anyone until necessary. The time has come for the Government to step in and rectify the situation with an appropriate policy direction. Such a policy should look like this:

Imported blank floppy disks should be subject to duty. This satisfies the original requirement to protect our local floppy disk assembly industry. Software, however, should be free of duty, as should imported diskettes which carry software; these diskettes pose no threat to the two local assemblers.

Some will argue that the local software industry merits protection through imposition of duty on imported products; I would argue against that for the time being, as we are still in no position to satisfy more than a fraction of our local requirements for software – in range, not quantity, that is. In addition, I, like many other users, would very much resent being forced to pay a premium for a product simply because the author of an inferior local product has successfully sought protection. When buying tools for my business, I feel I have a right to buy the best, and all suppliers should have the right to try to produce it.

The issue for local software companies is not protection to assist them to survive in the local market; it is assistance in achieving a foothold in overseas markets. To succeed in the US, an Australian product must previously have been able to hold its own in the local market, against its intended US competition, without the assistance of protective tariffs. That is the breeding ground for a successful Australian software industry. An industry that can only supply the local market, and that with Government assistance, is no use to us – we need exports.

If you are a software producer or author who has to buy products overseas, and if you feel strongly about the way the Customs Service has acted against your interests, I urge you to write to the Minister for Industry and Commerce, Senator The Hon. John Button, at Parliament House, Canberra 2600. Even if you only scribble 'I agree' on a copy of this editorial, please act now. I shall certainly be writing to the Minister, enclosing copies of letters from concerned readers.

— Les Bell

Can DECmate II convince you it's the most powerful desk-top word processor you can buy?

Yes-at a single stroke.

The secret is on the right. Digital's unique Gold Key.

At one stroke it gives you instant access to the many word processing functions of DECmate II that, on less powerful machines, usually need a string of hard-to-remember commands to use.

DECmate II's specially labelled keys then let you delete, add, move or transpose any portion of text from single letters or words to complete paragraphs and large blocks of text.

The Gold Key also *reverses* the function of other keys. So incorrect instructions or deletions can be rectified instantly. It means a lot of productive work gets done, not tediously–but effortlessly.

You can also store strings of commands that you use frequently and recall them with a single User-Defined Key (UDK) to avoid needless repetition. Up to 10 of these UDK's of your own choosing may be stored–ready for use.

And at the other end of the process, while you're editing one document on your DECmate, its letter-quality printer can produce up to eight other documents waiting in a queue.

But even though DECmate II offers you a range of word processing functions you'd be hard pressed to find in any other system, there are still more reasons to go for DECmate. Such as its List Processing, Sorting and Math functions.

Plus, to cap its versatility, a CP/M™ option module that lets you run a whole range of industry-standard software from Financial Planning to Bookkeeping.

DECmate II really is versatile enough to manage an entire office.

And its communications capability means it can "talk" to other DECmates, larger Digital computers and those of other manufacturers. So it will grow as *you* grow. Right up to a complete office network with world-wide communications facilities.

All this plus user training courses, 12 month on-site warranty* and access to Digital's Helpline.

Find out more by phoning the toll-free number (008) 22 6446. If you're in the Sydney Metropolitan Area phone 412 5590.

Or send in the coupon for details of your nearest Authorized Digital Dealer.

And let DECmate II convince you of its power and versatility "in person."

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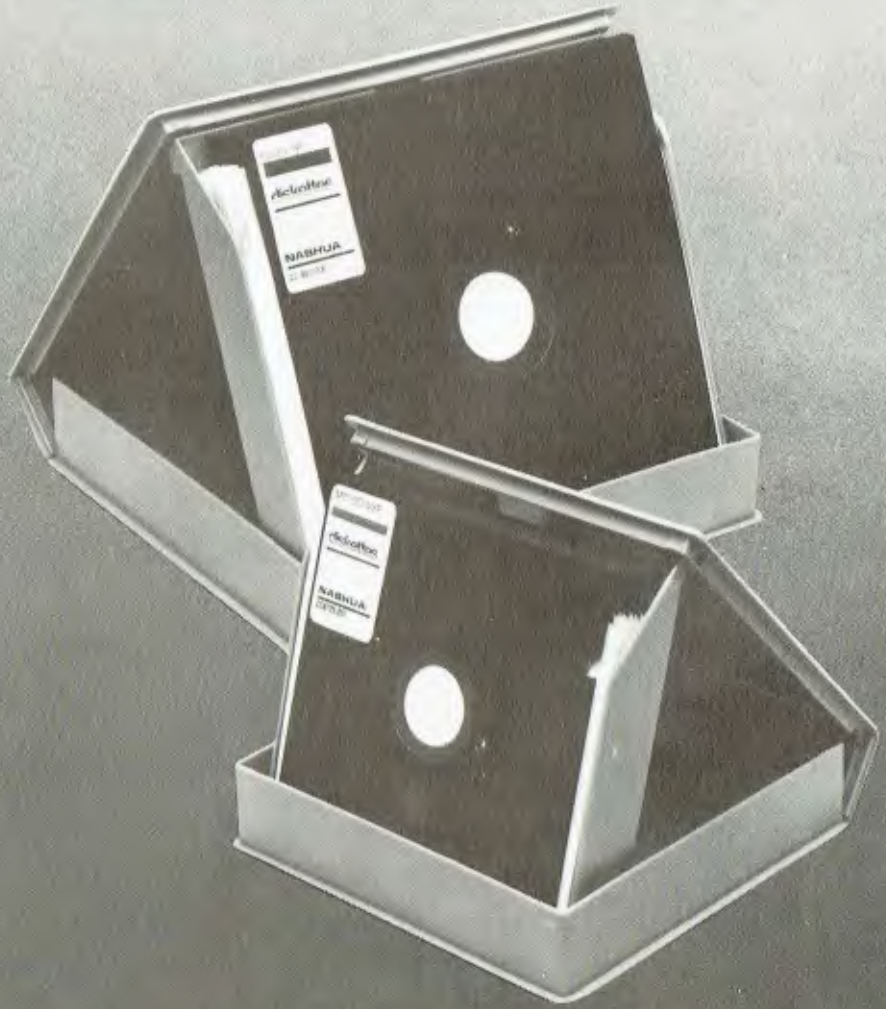
Name _____ Address _____ Postcode _____ Phone _____

Dec 58 R/YC/1/4

"Quality Circle" Diskettes



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your computer news

Born Again Osborne

OSBORNE seems to have risen from the depths of receivership in the United States to announce it will launch an IBM-compatible Osborne PC portable.

Shortly before Osborne filed under Chapter 11 legislation for debt reprieve, former chairman and founder Dr Adam Osborne said the company would soon release a new personal computer that would run IBM software without modification.

The company is now under new management, following approval by a bank consortium and creditors, and is arranging production for a machine to follow the Executive 1.

The new Osborne is taking shape in a Canadian factory, and according to a source who has seen a prototype, "the machine will be very IBM-compatible". Though it has not reached final stages of production – it is due for release in the US around July at an estimated price of US$3000 – many main features have been decided. These include the ability to run PC-DOS application programs, Microsoft Word, Lotus 1-2-3 and Microsoft graphics simulator. There are to be slots for IBM expansion boards, and an IBM-type keyboard with the shift and lock keys and Return restored to their customary positions. Memory has been considerably expanded, with 256K internal RAM standard, and dual double-sided double-density floppy disks available with 800K capacity. It will run the Microsoft 3.0 operating system with window facilities.

Stanley Folenski, who recently formed Osborne Computer Sales (Australia) at 93 York Street, Sydney, to sell the Osborne range, said the demand for both Osborne I and Executive models is still high. Currently, the Osborne is priced at $2185 and the Executive at $2700 (compared with its original announced price of $3950), but Folenski says these prices could go higher in the next three months as costs of obtaining supplies from the US are increasing.

Osborne is also said to have plans for a colour portable personal computer and a new machine, called Vixen, in the briefcase style.

The Executive I will continue to be manufactured and supplied throughout 1984. Additional CP/M Plus software, including a utility package, is becoming available from software vendors and user groups.

Another announcement from the reorganised company stated its commitment to focus 80 per cent of its resources and attention on the international marketplace. This is said to bode well for Australian Osborne dealers and users. ❑

More For Less

ANDERSON DIGITAL EQUIPMENT had a large influx of funds late in 1983, which they claim they have now deployed toward making more of their computer equipment available in Australia, at lower prices.

Along these lines, the company is holding a New Year Sale of the two latest Televideo units, models 914 and 924. The 914 is an ergonomically designed terminal with three non-volatile, programmable function keys; 64 special graphics characters; RS232C buffered printer port; three print modes and so on. The 924 has the same features, plus an extra 13 programmable function keys; a reconfigurable keyboard; character block graphics; programmable delimiters; logical attributes and eight resident national character sets.

Anderson is also advertising its Houston Instrument DMP-40-2 two-pen plotter for the price of a one-pen plotter. The plotter has not only two pens, but two format sizes and two intelligence levels (for plotting in either smart or incremental mode), and over 100 compatible programs.

A bit of the proverbial dangling carrot is this one, because you have to contact ADE (PO Box 422, Clayton 3168; phone (03) 544 3444) to find out the special prices. ❑

The Televideo 924 terminal, available from Anderson Digital Equipment.

Accounting Made Incredibly Easy

MAGNASOFT recently released an accounting package called Magnabiz which is designed for use by people who run small businesses, but who have no knowledge of accounting or computers.

Once running on your computer – which may be an IBM-PC, a Sanyo MBC 550 or 555, a Tandy Model 1 or 3, an NEC APC, a Morrow MD 11 or the Sharp PC5000 – Magnabiz requires only that you type in information regarding incoming and outgoing money. That is, you enter details of invoices (both those issued and received by you), cheques (both issued and received), credit notes (issued and received), bank deposits, petty cash (taken from your receipt slips) and bank charges (the various turnover taxes from your bank statement). It is estimated that this should only take ten minutes a day.

Thereafter, all calculations, allocations to accounts, debits, credits and so on are done by the computer. The computer can then be made to display a range of information, either on the screen or by printing it out. It can give you: a complete list of all transactions, invoices, cheques, cash, credit notes and so on, including invoices not yet paid, both inwards and outwards; a listing of all actual cash transactions, so you can see where your cash has come from, where it has gone and how much is left; a continuous listing of your cheque book, so you can see what cheques you've written and when; a listing of transactions you have made with each creditor and debtor; a full petty cash listing; a report called a 'Profit and Loss Statement', which gives the profit or loss of your business, right up to your last entry; and a skeleton balance sheet, which includes your stock, plant, fixtures, fittings and most of your capital items.

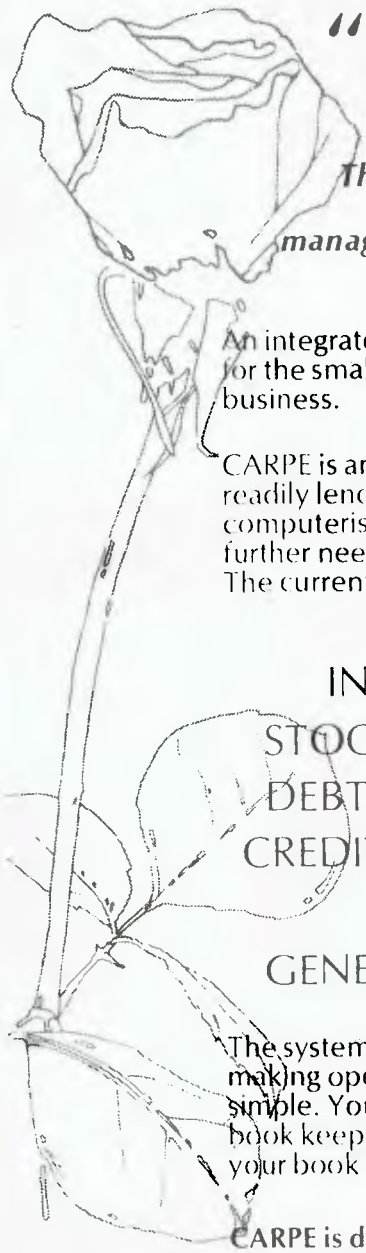
The manual is also said to be extremely easy to read.

For more information, contact Magnasoft, 9 Perry Street, Matraville 2036. Phone (02) 666 4101. ❑

ACCOUNTING PROBLEM?

"CARPE"

Have the solution



The "CARPE" general accounting and management information system.

An integrated accounting system for the small to medium size business.

CARPE is an 'on-line' system readily lending itself to computerising other areas as further needs of users are known. The current release includes:

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STOCK CONTROL
DEBTORS LEDGER
CREDITORS LEDGER
&
GENERAL LEDGER

The system is menu-driven making operation extremely simple. You can computerise your book keeping without terrifying your book keeper.

CARPE is designed to run on CP/M based systems. Computers such as the IBM PC, **Kaypro, Columbia,** Osborne, Morrow, Sigma and more.

Tested & proven in over 200 installations around Australia

All you need is a minimum of 56K of memory and dual disk drives.
CARPE is available from your dealer or directly from:—

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30 FISHER ROAD, DEE WHY, N.S.W. 2099

CALL **(02) 981-2022** for more information

DEALER ENQUIRIES ALSO WELCOME

The Australian-designed Porta-Pak transportable computer.

New Portable

THE PORTABLE COMPUTER COMPANY launched its new Australian-designed Porta-Pak at the 1984 Personal Computer Show in March.

The new machine has two 1 Mbyte drives, 128K RAM and a Z80B running at 6 MHz. It is about half the size of the Kaypro and will retail for $3395 (including tax).

The Porta-Pak will be sold with CP/M 2.22 (allowing access to the extra 64K RAM), Spellbinder word processing and office management system and several utility programs.

The Porta-Pak also has 640 by 304 high-resolution graphics, universal terminal emulation, user-definable character set and the ability to read and write to other formats including those of the Osborne and Kaypro.

For further information, phone Steve Townsend on (02) 81 3070. ❑

The Big Board 3, newly available from C-Tech.

C-Tech And The Big Board

LOOK! Up in the sky! Is it a bird, is it a plane? No! It's son of Big Board. Yes, Big Board is watching you. The Big Board 3 has just been announced by C-Tech Managing Director, Greg Boot BSc.

C-Tech, a division of Ritronics, has put a prototype on display with features like a 6 MHz Z80B, on-board modem, voice synthesiser and 256 Kbytes of RAM. Future expansion to 8088 and full high-resolution colour graphics is planned.

Other items on offer from C-Tech include support for popular home computers including Apple, Microbee, Spectrum and Commodore 64, each of which has a comprehensive range of software now available for it. Some of the business applications are Spellbinder, with advanced proportional spacing and macro development language, and Vedit. There are also many advanced programming languages and assembler available, and editor systems.

C-Tech staff are also able to help with the common problems encountered with implementing new features on CP/M.

C-Tech can be found at 48 A'Beckett Street, Melbourne 3000. Phone (03) 347 7917. ❑

The newly released Direct Addresser.

Labels Problem Addressed

A WEST GERMAN company has introduced a direct addressing unit to the Australian market. It is available from the Special Products Division of Jenkin Security.

The Direct Addresser prints addresses directly onto standard envelopes, letterheads, cards or forms, irrespective of their size or thickness. The Direct Addresser prints the address using a static 64-needle printhead, with the envelope passing below at an average rate of 5000 addresses per hour.

For further information contact Ian Neville at Jenkin Security. Phone (02) 436 3163. ❑

Sorcerer Not Abandoned

AURORA DATA SERVICE has announced that though the Sorcerer is now an 'orphan' computer, it has not been totally abandoned. Continued support will be available in the form of a catalogue, available on request, which includes information on the availability of games, utilities, educational and CP/M programs, memory upgrades, service and repairs for ailing Sorcerers.

For further information, write to Aurora Data Service, PO Box 80, Villawood 2163. ❑

Programs For Children

MICRO NATIONWIDE, a publisher of educational and home market software, has announced the release of Daybreak Software.

Designed for children ranging in age from three to 15, the programs cost $37.95 each, and are said to be compatible with the Apple II, Apple IIe, TRS-80 and Commodore 64 computers.

Further details may be obtained from Micro Nationwide, 13/9 Bungan Street, Mona Vale 2103. Phone (02) 99 1772. ❑

NEW MODEL!

CICADA 300 T
DATA MODEM
WITH INTEGRATED TELEPHONE

For user installation to a standard phone socket without Telecom assistance, the new **Cicada 300T 300-Baud data modem** features fully integrated phone for maximum convenience. With all the legendary performance and reliability of the standard Cicada 300:

Or, buy the continuously improved standard Cicada 300 for use with your own telephone. Now operated by hundreds of government, business and private users, the Cicada series modems carry a full, meaningful warranty.

Specifications (Both modems). Compact answer-and-originate units for direct connection to phone lines and for computer interface utilising either RS232C or V24/28 systems. Unit measures 203mm x 152mm x 63.5mm. Telecom approval number C83/37/1011.

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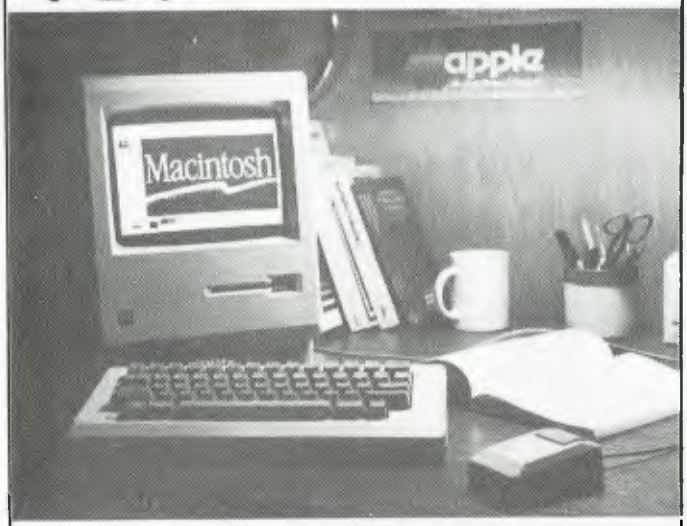

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The Pacesetter P17 terminal.

Pacesetter Peripherals Commences Business

PACESETTER PERIPHERALS, a division of VSI Electronics, has recently commenced operations in Australia.

It is marketing a range of computer peripherals such as the Texas Instruments printer and the Microline printer. The Microline is a dual-pass proportional printer that operates around 350 characters per second. The printhead is a 9 by 9 matrix.

Pacesetter is also introducing a terminal, the Pacesetter P17, to its range. Its capabilities include reverse video, half-intensity, blink, blank and underline. The screen size is 24 by 80 characters plus a status line.

There is a daisywheel printer from Silver-Reed that operates at up to 40 cps.

For more information contact Jason Earle at Pacesetter Peripherals, phone (02) 439 4655. ❑

Computers In The Mail

A NEW Sydney company called Micromail is marketing computer equipment by mail order. Micromail markets hardware, software and peripherals to consumers in the home/personal computer market segment.

Managing director of Micromail, Justin Beck, says Micromail is a club for consumers who wish to save money, avoid retail aggravation and obtain all their microcomputer products with one phone call.

Micromail maintains 24-hour service and can be reached toll-free on (008) 230 200, or in Sydney on (02) 449 5600. ❑

Golden Joystick Awards

MELBOURNE HOUSE, an Australian-based publisher of books and software for home computers, recently received four awards from a total of five categories at the Golden Joystick Awards in the UK.

'The Hobbit' won 'Best Strategy Game of the Year' for 1983, and was runner-up for 'Game of the Year'. 'Penetrator' was voted runner-up in the Best Arcade Game of the Year category. Overall, Melbourne House was hailed as one of the top four software publishers of the year.

Software was judged on the basis of votes sent to *Computer and Video Games Magazine*. ❑

Dick Blume, Computer Software Consultant

"I've been writing business programs on the same computer for 4½ years.

It's still state-of-the-art."

How I did it

Buying the right business computer was one of the hardest decisions I've ever made. As a software consultant I need a computer that is always the best available. Impossible, you might think in the fast changing world of computers? So did I until I bought a Universe.

'I bought the very first Universe – so long ago they hadn't even invented the name!'

At the time (over four years ago), my Universe was 'state-of-the-art', with a 4MHz Z80 (8 bit), 48K of memory, 80 column display and 600K of disk capacity. There is no way this would be adequate for me or my clients now.

'Without the Universe, I could not have stayed state of the art'

If I had bought any other computer it could not have been upgraded sufficiently to keep up with my work needs. I would have been forced to upgrade by selling the machine or compromise in my work for my clients.

'My Universe has been upgraded 8 times – it's a great investment'

I like to boast that my Universe was running both 8 and 16 bit software before IBM ever thought of the PC. But jokes aside, owning a Universe has enabled me to get the benefits of the latest technology **first** and at low cost. I now run 8 and 16 bit processors, more and faster memory, a different terminal, more elaborate I/O facilities and more disk capacity.

'Software and data are always secure'

Working for R.M. Smith, one of Sydney's fastest growing wholesale grocery firms has taught me how essential it is to be able to upgrade while securing software and data. I am lucky that R.M. Smith use Universe. As a result, their computer system has been able to cope with 300% expansion in 2 years and has never lost one bit of data during this time. Reliability has been outstanding by any standard. Total downtime, with 3 machines has been 2 hours total. Whatever way you look at it, the Universe is one hell of a computer for a business to have on its side."

Universe Supercomputer Specifications

☐ **Runs both 8 and 16 bit, single and multiuser.** All standard operating systems including CP/M & CP/M 86 with Multitasking, CP/M 8-16 'PLUS' (8 and 16 bit at the same time), MP/M 8-16 'PLUS' and MP/M 86 (Multitasking, Multiuser 16 bit with ultra high speed 10MHz processor). Access to a massive software base. Expansion as and when you need it.

☐ **Multiple Program Selection (MPS).** Our version of CP/M can swap between any mixture of up to ten separate programs almost instantly.

☐ **Memory may be expanded** up to 1 Megabyte and disk storage up to 200 Megabytes.

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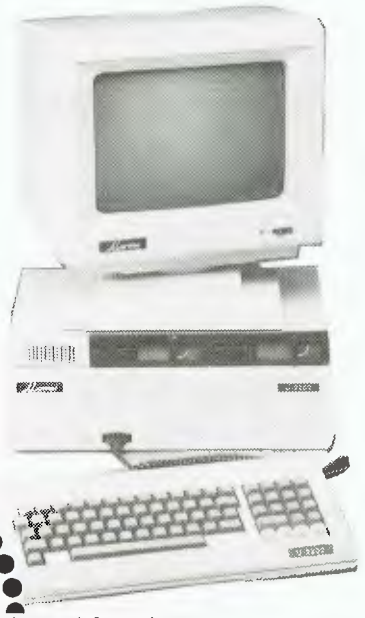

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Commodore's new 700 Series business machine can be packaged in versions to suit varied requirements.

Business Commodore

COMMODORE has launched the Commodore 700 series of business computers. Available with either 128K or 256K of RAM (expandable to 896K), the Commodore 700 is supported by a wide range of software for everyday business procedures and more specialised applications.

The machine's 80-column by 25-line display screen can be tilted or swivelled and the keyboard can be moved away from the main unit, to suit the user.

The Commodore 700 can be packaged in different versions, depending on user requirements. The standard version uses a 6509 microprocessor with an 8088 microprocessor as an option. This second processor supports operating systems such as CP/M-86 and MS/DOS, which, in turn, enable languages such as FORTRAN and COBOL to further expand the range of software which can be used.

The standard 128K machine retails for $2160 and the standard 256K machine retails for $2500. For further information, contact Commodore Business Machines, 5 Orion Road, Lane Cove 2066. Phone (02) 427 4888. ❑

Joint Microelectronics Research Centre

THERE WAS a plethora of professors, a bevy of businessmen, a melee of ministers – in short, a cerebral circus – at the recent announcement of IBM's grant to the Joint Microelectronics Research Centre at the University of New South Wales. Worth an estimated $1 million, the grant will include post-graduate research positions, personnel exchanges and donation of laboratory and computing equipment.

The Joint Microelectronics Research Centre combines the work of scientists at the University of New South Wales and the Royal Melbourne Institute of Technology. It was set up in 1982 through a grant from the Federal Government as one of its Special Research Centres.

The 'VLS Blue' (IBM) grant will mean that the JMRC will have two post-graduate positions funded each year for the next

four years. The positions will be with the JMRC either in Melbourne or Sydney.

The personnel exchanges will be with the huge IBM laboratories at Yorktown Heights, New York. The exchanges, which have already begun, will be for long and short terms. Yorktown Heights is IBM's leading research establishment and is one of the most highly respected microelectronics laboratories in the world.

The equipment that will be used is already being shipped from Yorktown Heights, where it is no longer needed. It will be very useful in a variety of research projects and includes an ultra-high vacuum system and a vacuum furnace to be used in chip development.

The Director of the JMRC, Professor Graham Rigby, thinks that the IBM agreement will mean a 30 per cent increase in research at the Centre. The grant will help the Centre continue and expand its work in areas such as the design and fabrication of electronic chips, research into improved microelectronic materials and processes, and the development of better and cheaper solar cells.

The Centre's research program has brought it considerable international recognition. It has resulted in several important contributions to the science of microelectronics. Some of the more significant contributions have been:

Creation of the most efficient solar cells in the world. The JMRC cells convert 19 per cent of sunlight into electricity.

Development of a transistor with two-and-a-half times more amplification than any other.

Development of 'stitching' to dramatically improve the adhesion of thin metallic films to almost all materials.

Work on a method which enables people without any design experience to design a chip, with the aid of a computer.

The Minister for Science and Technology, Mr Barry Jones MP, addressed the multitudes and remarked on how impressed he was with the IBM research labs at Yorktown Heights, which he recently visited.

"They do not make arbitrary distinctions between pure research and application research," he said. "If you asked them what the economic relevance of what they were doing was they couldn't tell you. They are dealing with long-term possibilities, not short-term perceptions."

In explaining why IBM had made such a generous contribution, Mr Brian Finn, Managing Director of IBM Australia, said it was his company's belief that it should contribute to the communities in which it does business.

"We believe this Centre can help Australian industry through improved microelectronic design skills and by innovative processes and techniques." ❑

First Software For Macintosh

MICROSOFT has announced a full range of application software for the Apple Macintosh and its intent to release other programs for the Macintosh in the near future. These tailored versions of Microsoft's Multiplan, Word, Chart, and File programs comprise the first line of software to be announced for the Macintosh by any vendor. In addition, Microsoft BASIC, the most widely used high-level language for microcomputers, is also available for Macintosh.

A spokesman for Microsoft said, "Microsoft expects the Macintosh to become very widely used and we are committed to being in the forefront of providing software that takes full advantage of all the machine's features and power."

Microsoft Multiplan, BASIC and Chart will be available in April, wherever Macintosh is sold and through authorised Microsoft dealers. Microsoft Word and File will be available in the second quarter of 1984.

For further information, contact Microsoft, PO Box 98, Terrey Hills 2084. Phone (02) 450 2522. ❑

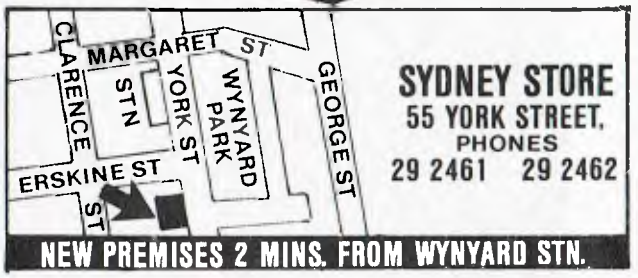
CITY PERSONAL COMPUTERS

The Australian Personal Computer Show may be over but you can still see all the latest for IBM and Apple systems at City Personal Computers. Software for both, the new printers from Epson, the latest software from Microsoft. And if you call in now you could pick up the best deal ever on disks and consumables!

Sydney's leading independent computer store for over three years, C.P.C. has never looked better. Our two brand new stores have more stock than ever, including the amazing Apple Macintosh.

We are getting more software and accessories for Mac all the time, so call at one of the stores for a demonstration of the latest arrivals.

TWO BRAND NEW LOCATIONS



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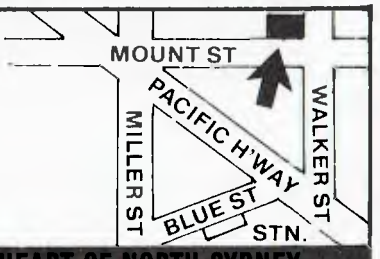

NEW STORE IN HEART OF NORTH SYDNEY

Communications Card

DIGICARD has released a new communications card which allows communications between mainframes, minicomputers or microcomputers via modem or by direct-wire RS232 connection.

The company's claim is that you "no longer have to mix and match cards, cables, modems and expensive software packages, just plug in the Digicard Communications Card to your modem and telephone, and dial your information service telephone number."

Included with the card is an advanced version of the Digicard communications terminal; a two-metre cable for plug-in connections to either your direct connect or acoustic coupler; an extra cable for users who wish to use the card as a serial interface; and a manual.

Apparently, a communications package comprising the Digicard Communications Card, a 300 Baud direct connect modem and a subscription to *The Australian Beginning* is available at a special introductory price from Apple dealers or Maclagan Wright and Associates. Those interested should phone (03) 439 1366. ❑

Coco II

TANDY has announced the release of the new TRS-80 Color Computer 2 range of home computers.

The new line includes: the 16K Standard Color Computer 2 ($349.95), the 16K Extended BASIC Color Computer 2 ($449.95) and the 64K Extended BASIC Color Computer 2 ($599.95).

The Color Computer 2 range is a refinement of TRS-80's Color Computer 1. One of the new models' features is a redesigned 'electronic typewriter'-style keyboard.

The interior of the Coco 2 has also been redesigned, to enable easier expansion and servicing, and the new Coco's exterior is coloured white – replacing the silver-grey of Coco 1.

The 64K Color Computer 2 can be used with two new disk operating systems: the OS-9 ($99.95) and the BASIC OS-9 ($149.95). Both systems access the entire memory of the computer and include editing, assembling, execution and debugging modes.

The improvements to the Color Computer range have meant similar improvements to associated peripherals, and Tandy's existing range of Color Computer software is compatible with the new Color Computer 2 hardware.

For further information, contact your nearest Tandy dealer. ❑

Successor To Lotus 1-2-3

THE DUST hasn't even settled on Lotus 1-2-3 and already the Lotus Development Corporation has brought out a new package that should be available around June.

The package, named Symphony, will initially be available only for the IBM PC and XT computers. It combines spreadsheet, graphics, enhanced database management and full word processing capabilities, and makes extensive use of 'windowing'. It is fully RAM-based in a minimum work area of 320 Kbytes.

One important feature is interfaces to support third-party software, which it is hoped that users and vendors will develop.

The Australian price should be around $1100 to $1200. 1-2-3 users will be able to upgrade for around $200.

For more information contact Doug Ruttan, 4/73 Albert Avenue, Chatswood 2067, or phone (02) 411 5711. ❑

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Top Projects Vol. 8 is available at newsagents, selected electronic suppliers or directly, by mail order, from ETI Magazine. P.O. Box 227, Waterloo 2017 for $4.95 plus $1 post and handling.

Pick the right computer... and it will still be the best next year

Dozens of computers come onto the market each year. They get good reviews; this year. Next year something better will come along. Most computers are at the forefront of technology *when they are designed.* A couple of years down the track they're second rate. When you are running a business you can't *afford* a computer that may let you down in a year or two.

To stay ahead you need a better computer every year

We build the Universe computer so it can be upgraded as technical improvements come along, or as your needs grow. Its totally modular design means it can be continually upgraded both in *hardware* and *software*. As new developments come along, Universe can take advantage of them first. It also means that Universe owners are never caught out with less computer than they need. Any model Universe can be upgraded to any other.

How far can a computer grow?

Most computers have very little expansion capability to meet your growing needs. Universe has almost unlimited expansion capability. To give numbers:
Memory to 6 megabytes, storage to 200 megabytes. While you may never need this sort of capacity, it does mean you are unlikely to run out of computer.

8 and 16 bit software. Can I run both?

On most computers you run one or the other. On Universe you can run both.
Universe takes the whole thing further by letting you run 8 and 16 bit software together in both a single user (CP/M 8-16) or multiuser (MP/M 8-16) installation.

Networking versus Multiuser. Avoid an Information Bottleneck

Eventually you'll probably want to have more than one person using the computer at a time. Accounts and sales or wordprocessing and data entry. Most computers get around this by offering 'Networking'; this means that several computers share the same data storage. In typical business situations this arrangement is *unworkably slow.* Universe uses an alternative and much faster Multiuser system. Each user shares part of the central computer and data with a huge increase in speed of access to data.

Multiple Program Selection. Unique to Universe but Essential to Every Business.

A fully 'computerised' office runs 6 to 8 programs or packages during a day. Most computers let you run one at a time. Our unique MPS (Multiple Program Selection) allows you to switch between any 10 CP/M 80 programs almost instantly.

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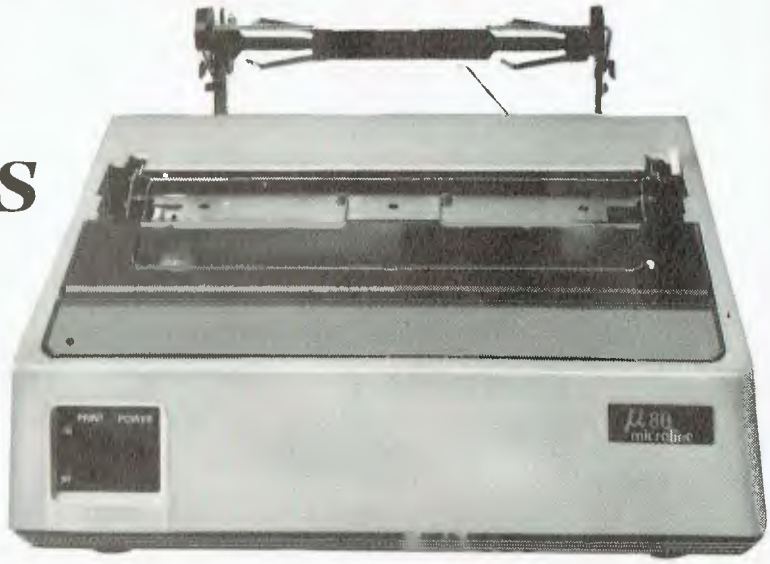

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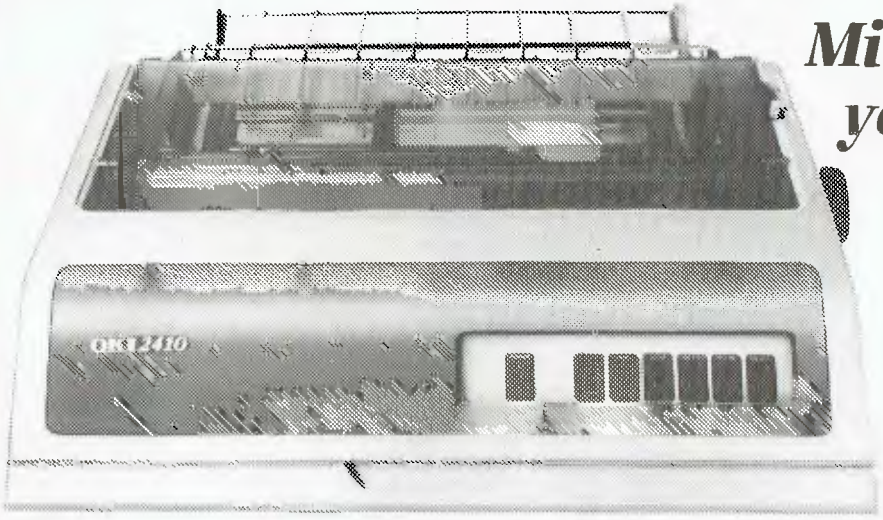

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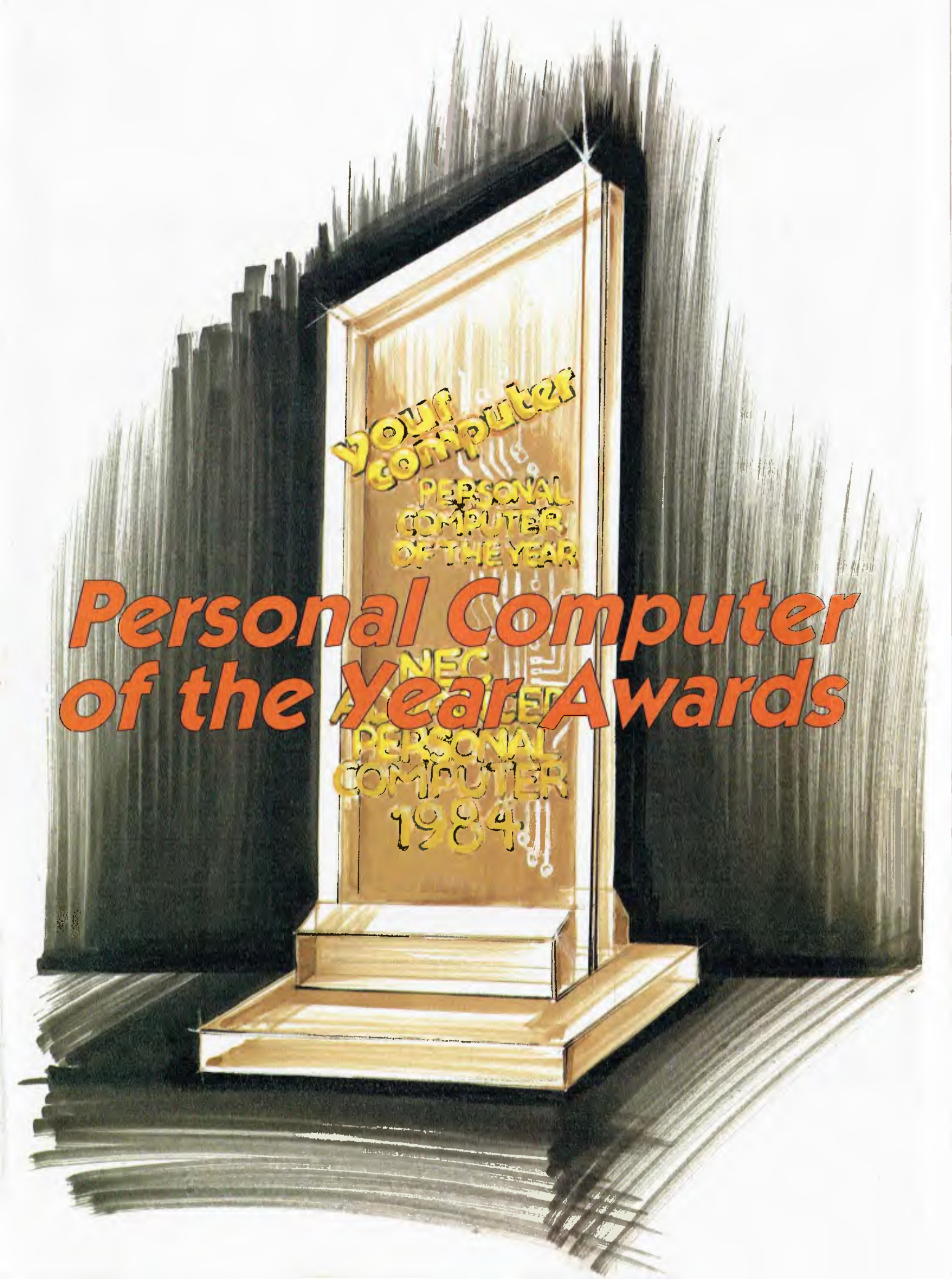


Personal Computer of the Year Awards

The Second *Your Computer* Personal Computer of the Year Awards

Once again ***Your Computer*** *surveys the computers released during the last year, to choose the outstanding performers. A new feature of the award this year was the addition of software products, and special consideration for Australian products.*

ONCE AGAIN the time has come to make the *Your Computer* award for the Personal Computer Of The Year. Longtime (a year is a long time in the microcomputer world) readers will recall that last year the Award was presented to NEC Information Systems Australia for its Advanced Personal Computer, a fact that NEC has reminded everyone of in its advertising!

This year the Award has been expanded somewhat to include a new category. For the first time, we are making an award for the Software Product Of The Year (the SPOTY Award?!). We have always recognised that software was equally as important as hardware in any computer system, and becoming more so. Last year we considered making a software award, but decided to concentrate on making the first hardware award right. This year, having had the experience of last year's Award, we felt confident about tackling the SPOTY Award.

Last year we also discussed the possibility of separate consideration of Australian hardware and software products. For the same reasons, we decided not to leap into this.

The Awards are these, then:

The Personal Computer of the Year Award: awarded to the personal computer, released on the Australian market in the last year, which represents the greatest step forward in the state of the art.

The Software Product of the Year Award: awarded to the software package, released on the Australian market in the last year, which represents the greatest step forward in the state of the art.

We will also announce special commendations for Australian hardware, acknowledging Australian achievement in hardware design, support and marketing, and for Australian software, recognising Australian achievement in software design, support and marketing.

PERSONAL COMPUTER & SOFTWARE PRODUCT OF THE YEAR AWARDS

It is important to recognise that the two pairs of 'Awards' serve different purposes. First, there are only two true 'winners'; the PCOTY and SPOTY awards are for the best products released during the previous year, and are primarily decided on technical excellence, product support, utility and other criteria, with little attention paid to success in the market. This is because newly released products may only have appeared on the market and barely started to sell.

The commendations differ in two major ways: firstly, they consider, not machines that were released in the last year, but machines (or software) which have achieved notable success in the last year, either commercially, or in terms of software support, upgrades, technical excellence or, in particular, export success. The reason for this difference in accent is as follows.

In the US, when a new computer company starts up with the intention of designing and releasing a new machine, it is generally able to hire talent who have already been through the exercise. Thus, before the machine is released, management will already have considered – in depth – product support issues such as what software will be available, both directly or from third parties, pricing policies, distribution, available upgrades and their cost, and so on.

It would be fair to say that Australian product launches have been, in comparison, rather amateurish. It's not that Australian companies – or rather, their staff – aren't smart enough to get things right; it's more a lack of experience, and sometimes budgetary constraints, that are the problem.

After a few months, we generally get it right – but only after phone calls from dissatisfied users and other pressures. In order to win the PCOTY Award, an Australian manufacturer will have to get it right, and get it right first time, displaying a level of experience that will enable the company to tackle export markets with confidence.

We look forward to the day when an Australian company wins the PCOTY Award, for then Australia will have produced a world-beater. Until then, we will give an annual commendation to encourage local manufacturers.

The Short List

As usual, the panel selected a shortlist of contenders for the title. The original shortlist was as follows:

Apple's Lisa
Bytec Hyperion
Canon AS-100
NEC PC-8201A
Olivetti M10
Sharp PC-5000
Tandy M100
Texas Instruments Professional Computer
Wang Professional Computer

However, for reasons best known to themselves, Wang declined to accept the panel's nomination for the Award, and refused to supply a machine for evaluation.

For the Software Product Of The

Year, a similar short list was drawn up:

Lotus 1-2-3

That's it! Lotus 1-2-3 so clearly stood out as the dominant software product of the year that nothing else came close. Therefore, we had a winner from the start.

Of the Australian hardware products, two machines stood out, and were accordingly shortlisted: Applied Technology's Microbee and the Dulmont Magnum.

Of the the Australian software, we shortlisted two packages: Attache Accounting Software and the Zardax Word Processor.

Congratulations to all the short-listed companies. Getting to the short list is not easy; all these products are distinguished from the pack in some manner.

We have to remark, though, that 1983 was, in general, a pretty uninspiring year from the point of view of new products. Most of the new machines were simply clones or compatibles, and very few really contributed anything in the way of originality of design or improvements in performance. ❑

The Award Criteria

The winning machine/software must have been released on to the Australian market during the year immediately prior to the Awards. We distinguish between the announcement of a new product and its first sales; the machine/software must actually have been sold to end users during the period of time under consideration.

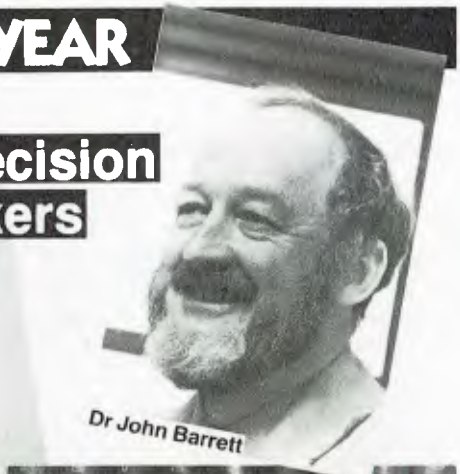
The major criteria which the panel used in judging the machines/software were (not necessarily in order):

1. Technical excellence in design, engineering and provision of advanced features, combining in its contribution to the state of the art and influence on future trends.
2. Ergonomic design, in terms of both hardware and software.
3. User support, documentation and training.
4. Value for money.
5. Performance.

In addition, the panel reserved the right to evaluate additional features as necessary. ❑

The Decision Makers

Dr Robert Graham



Dr John Barrett

Prof. Phillip Grouse

Len Rust

Les Bell

THE FIRST STEP in setting up the Awards was to convene a selection panel whose members had to be independent of any computer companies, yet intimately involved with the use of personal computers and software, and keen observers of the personal computer industry.

The panel, as last year, consisted of five people:

Dr Robert Graham is head of the Department of Finance at the New South Wales Institute of Technology, and is a leading expert on the use of personal computers in a corporate environment. He has been involved with personal computers since the late Seventies, and lectures widely on personal computer software.

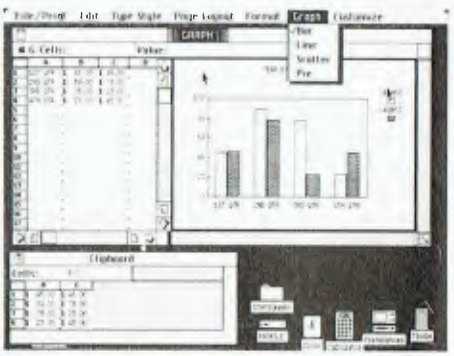
Professor Phillip Grouse, of the University of New South Wales, has long experience with microcomputers, including the design of a multi-user Z80 system in 1979. The author of a number of computer science texts, Professor Grouse maintains a keen interest in personal computing and often pops up on the Software Tools bulletin board system.

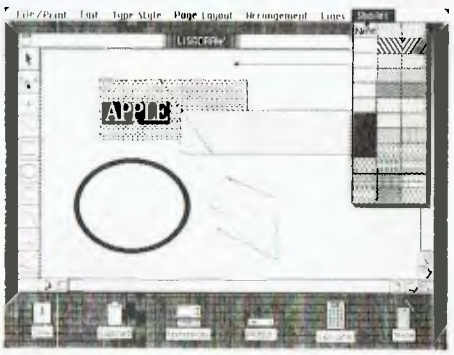
Dr John Barrett is a lecturer in the School of Education at Macquarie University, and regularly writes on education for *Your Computer*. He first came in contact with computers at the University of Oregon in 1969, and has been working with micros for several years.

Len Rust is the managing director in Australia of the International Data Corporation, a major United States marketing/consultancy company specialising in the data processing and communications industries. Part of the International Data Corporation's brief is to continuously monitor the microcomputer market in Australia, and for some years the company has been releasing total industry sales figures and forecasts.

Les Bell has been writing about personal computers since 1975, and has been editor and later consulting editor of *Your Computer* since its inception in 1981. He also lectures on programming and undertakes occasional consulting assignments. ❑ ▶

PERSONAL COMPUTER OF THE YEAR





And so – the winner ...

AT THE FIRST formal meeting of the Award Panel, after much individual discussion, a short list was drawn up of machines which obviously had what it takes to win the Award. This was done by a process of elimination from our list of machines released during the year. We now knew what characteristics our winner should not have, but were no nearer picking the winner itself. Hoping to speed the process, or at least, turn the discussion to attributes of a positive, rather than negative, nature, I asked each member of the panel to nominate his personal favourite for the Award. The result was unanimous.

One machine had clearly dominated during the year; a machine that was so new that a year after its launch, no other manufacturer has come close to emulating it.

Lisa.

All the judges knew it (a couple actually had Lisas), and all had used it. All were agreed. Lisa is so revolutionary a product that it stands out as the turning point in machine design. People will remember 1983 as the year that Lisa revolutionised personal computing.

To be sure, Lisa has a couple of drawbacks. Most notable of these is its price: when first released, it sold for $12,000 and was then reduced to just over $10,000 in the middle of the year. Although Lisa is revolutionary, this revolution would obviously not affect the masses!

Lisa works in a completely different way from previous personal computers. Where machines like the IBM PC require the user to type command lines involving file names and options, Lisa is operated by moving a pointer to various symbols called icons. The pointer is controlled by a small box called a mouse, which rolls around on the desktop. By pressing a button on top of the mouse, the user can select and manipulate objects.

Because Lisa is an information manipulation machine, this method of operation works well; select some information with the mouse, then manipulate it, often by making choices from menus.

Lisa has seven applications programs available from Apple. LisaWrite is a word processor which offers a number of special formatting features, such as multiple typefaces and type sizes. It is designed for ease of use; Lisa is most likely to be found on an executive desktop, so that the word processor will be used for occasional memos or reports. The accent is on ease of use and the ability to stress words or phrases through bold facing, italics, and other enhancements. With Lisa's high-resolution screen, the user gets exactly what he/she sees on the screen.

LisaCalc is a spreadsheet calculator with a number of interesting features. As with LisaWrite, the screen can be split into an arbitrary number of windows, although Lisa normally divides the entire screen into windows, and refers to these split-screen effects as 'panes'. LisaCalc has a true 256 by 256 spreadsheet, and can work with dates as well as numbers and text. But perhaps the most significant enhancement is the ability to copy areas of the spreadsheet into the LisaGraph program, which allows the user to produce line, bar, scatter and pie charts.

From LisaGraph, the completed graph can be transferred to LisaDraw for retouching, such as pulling a slice out of a pie, adding depth to wedges and other tricks. LisaDraw can also be used for original drawings of considerable complexity, such as organisational charts and other business graphics. Some samples are reproduced here.

For list maintenance, such as internal phone directories, a program called LisaList allows list extraction and sorting. For project management, LisaProject is a program which performs critical path method analysis and resource scheduling, providing beautiful project charts. Finally, for those who need to talk to company mini and mainframe computers, LisaTerminal provides terminal emulation with document transfer capabilities.

The beauty of the system is that all the programs operate in exactly the same way. Everything is completely consistent, and there are no unpleasant

Far left: Fully-configured Lisa, complete with mouse; mid-left: examples of LisaGraph and LisaDraw; left and above: Lisa's excellent keyboard, and the mouse used extensively to manipulate the data in the computer.

surprises. Occasionally, there are pleasant ones. For example, if you try to throw away a document folder containing one of Lisa's programs, Lisa will ask you to confirm that you really want to throw it away.

Data can be interchanged between programs by cutting and pasting. Select some work – text or graphic – and then choose 'cut' from the edit menu. Then move to another document and choose 'paste' from the same menu, and the data will be transferred. For example, Lisa has a desktop calculator, and it is possible to select the display of that calculator and copy it into a drawing. This is simply not possible with any other computer.

Physical Features

The physical construction of Lisa is also exemplary. The whole machine can be dismantled and modules replaced with no tools at all; everything works on clips or knurled screws. The machine's diagnostics take advantage of this, and the manual contains a section of colour illustrations which should enable the average user to replace any module without difficulty.

From the point of view of ergonomics, the Lisa comes out well. The keyboard is rather higher in profile than the fashion, but is nonetheless comfortable, with an excellent action. The screen is at a good height and can be positioned well, with the keyboard stowing under the screen to save space when not in use. The major problem is the additional 5 Mbyte ProFile hard disk, which either mounts on top of or beside the mainframe itself.

The Lisa documentation is superb. The User's Manual is excellent, with chapters on the Office System itself (which emulates a desktop on the Lisa screen), the calculator, the parts of the machine such as the mouse and keyboard, trouble-shooting and maintenance, and reference information. A complementary manual accepts the lit- ▶

Specifications and Report Card

Unit:	Lisa Office System
Made by:	Apple Computer Inc.
Processor:	68000
Clock speed:	5 MHz
RAM:	1 Megabyte
ROM:	Bootstrap and diagnostic only
I/O:	Two serial ports, one parallel port
Languages:	Pascal, COBOL, BASIC-PLUS, CLASCAL
Keyboard:	Full QWERTY + numeric keypad
Display:	High-resolution bit-mapped
Graphics:	720 by 364 pixels
Peripherals:	Dot matrix printer
Best points:	Powerful integrated software
Worst points:	Bit on the slow side

Ratings:	Excellent	Very good	Good	Poor
Documentation:	•			
Ease of use:	•			
Functionality:		•		
Support:		•		
Value for money:		• (now with Lisa 2)		

Extras included:	Dot matrix printer
Options:	Lisa terminal program, languages
Price:	Old price: $10,395 incl. software and printer, plus sales tax: new price (Lisa 2): $4995 incl. tax ($4412 excl. tax), up to $7695 incl. tax ($6802 excl. tax)
Review unit from:	Apple Computer Australia, 37 Waterloo Rd, North Ryde 2113. (02) 888-5888.

PERSONAL COMPUTER OF THE YEAR

Apple Lisa

erature for the matching accessories such as the ProFile and printer.

Each of the various applications programs has its own manual, with which the occasional user can easily master the packages. There is also an introductory hands-on tutorial, called LisaGuide, which clearly shows the user what to do and tests his/her progress.

Lisa is not without failings, however. There are two major flaws which are often levelled against the machine: firstly its high price, and secondly its slow operation. Apple is tackling both of these: price reductions have been announced, which make the Lisa much more affordable, and a new model has been introduced which will run faster, thanks to an upgraded operating system and disk hardware.

The Selection Panel was also heartened by the announcement of the Macintosh, which essentially makes the Lisa technology available at one-third of the price. This eliminates fears that Lisa was an orphan, a technological white elephant which would never receive outside support. In fact, third-party applications are now starting to appear, such as accounting systems and the popular StatPro statistics package. Lisa will also be able to run Macintosh software.

Early in the year, we heard that InfoWorld magazine had given its hardware award to the Tandy M100 and the software award to the Lisa software. The same thought had crossed the mind of at least one member of our panel as a way to stop the Lisa dominating the Award and providing encouragement for other vendors. But after consideration, we could not agree: Lisa works so well because its hardware is designed to support mouse-driven windowing software. Similar software, running on the IBM PC and similar machines, pales in comparison – and we were interested to note that an IBM PC with VisiOn actually costs more than a Lisa.

For all these reasons, the panel came to a unanimous conclusion: that over the last year, the Lisa stands out as easily the most revolutionary machine to be released. It is, without doubt, the deserving winner of the 2nd *Your Computer* Personal Computer Of The Year Award. ❑

SOFTWARE PRODUCT OF THE YEAR

Lotus 1-2-3

The winner of our Software Product of the Year Award didn't even have any competition in the same class as itself; Lotus 1-2-3 simply swept the board!

Lotus 1-2-3 was so obviously the winner of the Software Product of the Year Award that no other software package even made it to the short list.

THE NAME OF the game currently is 'integrated software'. This covers a multitude of sins, but basically it means programs that are easy to use because they all work the same way and can transfer information between them.

There is no doubt that the leader in this field is Lotus Development. Founded by Mitch Kapor, the original developer of VisiCorp's VisiTrend/Plot, this company has made its reputation on its first product, Lotus 1-2-3. This program combines the functions of a spreadsheet calculator with a graphics display and plotting program, a simple database cum list manager and some simple word processing facilities.

Within weeks of its release, 1-2-3 had become an instant success – in its first three months it sold 60,000 copies. It did what everyone believed could never happen: it repeated the success of VisiCalc. Pinstripe-suited accounting types, who one could never imagine having the slightest interest in personal computing, were suddenly discussing nothing else at their lunches. As VisiCalc was the driving force behind sales of the Apple II, so 1-2-3 is the major reason for a lot of IBM PC purchases.

1-2-3 now totally dominates the market for spreadsheet calculators. Nothing else comes close. While there is still a market for products which have specific features that 1-2-3 may lack, most financial types use 1-2-3 as their primary financial modelling program.

Originally released for the IBM PC and the Compaq (a clone), 1-2-3 is now available for the DEC Rainbow, TI Professional, Hyperion and Wang PCs.

Complete Software System

Lotus has been designed to be a complete software system, so that the user need never venture outside to feel the chill winds of the operating system. ▶

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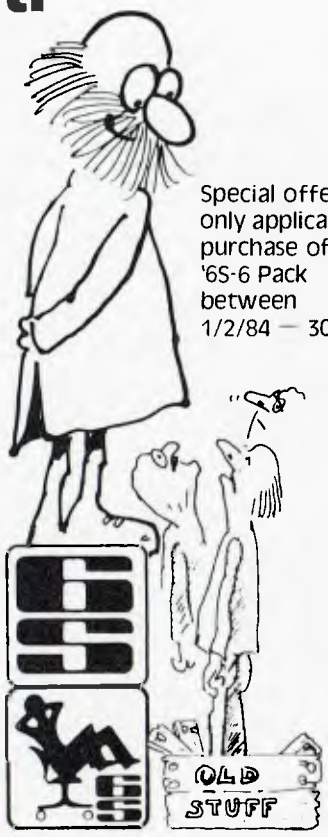

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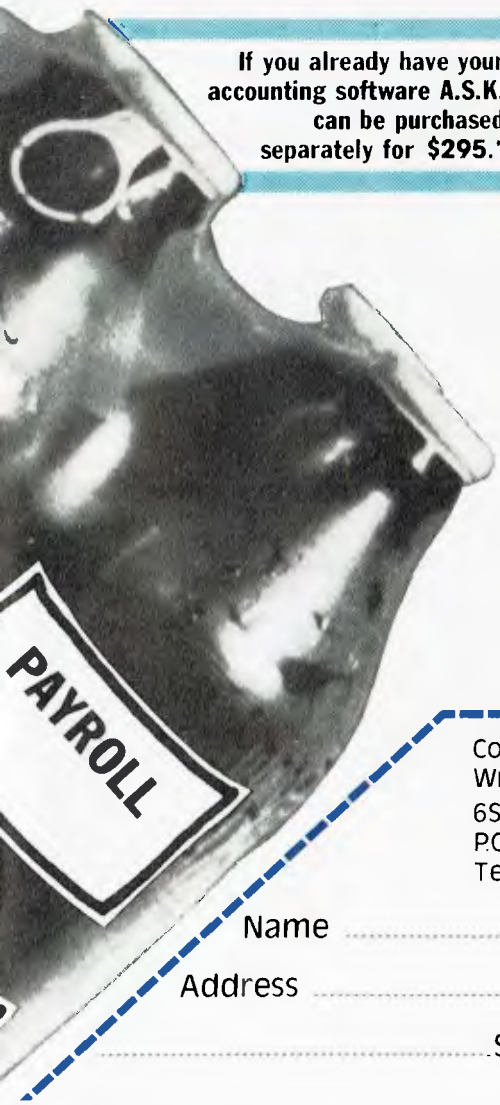

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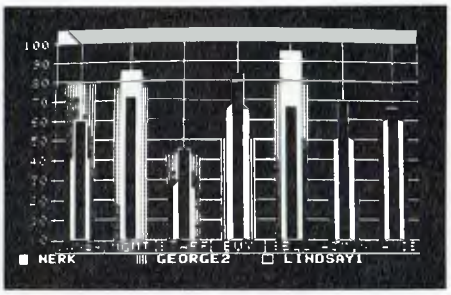

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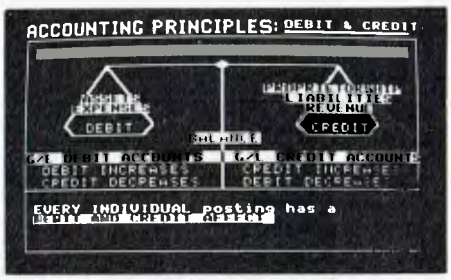

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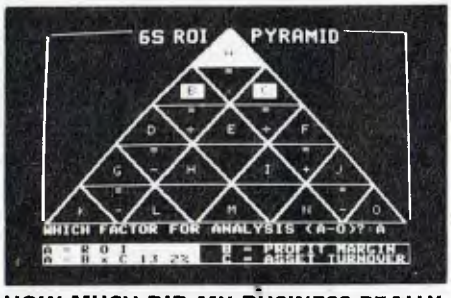

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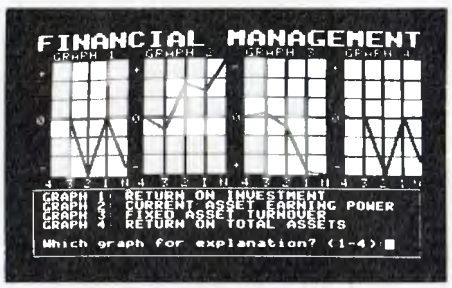

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SOFTWARE PRODUCT OF THE YEAR

Lotus 1-2-3

For example, the Lotus Access System disk manager allows the user to format disks, copy them, compare them and perform other maintenance tasks. Also in this level of the system are file translation facilities which enable the user to import and export data files, so that 1-2-3 works with VisiCalc, DIF and dBASE II files.

At its simplest level, 1-2-3 can be used in just the same way as VisiCalc — indeed, its more sophisticated commands work in exactly the same fashion. For most of the VisiCalc commands, there is a 1-2-3 equivalent, but there are some important differences: for example, where VisiCalc can only move rows and columns, 1-2-3 can move any range of cells.

The system continuously prompts the user with a list of available commands; selecting one of these will then display a list of sub-options, and so on down a tree-structured menu system. The system is very effective, and is made even more powerful by the addition of a context-sensitive help facility which ensures that it is very difficult to get into trouble.

Both the command selection system and the help facility are so well thought-out that they have started to appear in other products. In fact, the help facility in a software package being written by one of the panel members looks very similar indeed; imitation is the sincerest form of flattery ...

Lotus has a unique feature which gives it a major edge over the competition, in the form of its macro facility. This allows the user to associate sequences of keystrokes with a single letter key, and then execute them. This allows the system to be programmed – though not in any standard language. 1-2-3 supports this facility with additional features such as a command which allows the creation of menus and conditional execution of steps. It is surprising how many executives, who use a spreadsheet because they 'don't want to learn to program', are now programming!

The major enhancement which sets 1-2-3 above the competition is its graphics. By simply typing '/G', the user enters a graphics menu, which allows the creation of pie, bar, stacked-bar and scatter graphs. Up to six sets of data can be displayed at the same time – in colour, if a colour display is used.

Comprehensive facilities are provided for labelling, titling and annotating graphs in a range of fonts. Output devices supported include the IBM PC printer, other brands of printer, and plotters such as the HP7470A and the Sweet-P.

1-2-3 also provides a database or list management facility which is surprisingly powerful, considering that it is simply an extension of the spreadsheet calculator paradigm. Although 1-2-3 has a spreadsheet size of 256 by 2048, this is a theoretical maximum which is constrained by the memory size of the host machine. Most systems would probably have a maximum sheet about one-eighth that size.

The major limitation on the database manager is that it operates in memory, so that only small files can be maintained. Nevertheless, it is possible, using the macro programming facility, to write surprisingly sophisticated applications – although this is mainly a result of ingenuity rather than good programming practice.

Worldwide Success

That Lotus is a major success in Australia can be seen from the recent foundation of User Groups in Melbourne and Sydney. This is a tribute to the open-ended nature of the package, which is its major strength. Applications may be difficult to solve on a spreadsheet, but with a little thought, it is possible to find a solution using 1-2-3. It is this ability to perform tasks originally thought impossible, and the fascination of continually discovering new and productive ways to do things, that are the mark of a truly excellent software package. That, quite simply, is why Lotus 1-2-3 is the Software Product of the Year. ❑

PERSONAL COMPUTER OF THE YEAR

Bytec Hyperion

The Bytec Hyperion was first reviewed in ***Your Computer's*** *January 1984 issue, where it received a very favourable review, largely for its excellent mechanical design.*

THE BYTEC HYPERION falls broadly into the range of 'IBM compatibles', but with a few tricks and twists of its own. It looks nothing like an IBM PC, for example; instead, it is much more compact and portable, and looks equally at home on an executive desk as in the back seat of a car.

Most personal computers – or a great many at least – were designed by electronics engineers with little mechanical expertise. The result is generally a pressed metal contraption which is mechanically about as elegant as a piece of WW II tank equipment. Even some major manufacturers, from whom one would expect better, have committed this sin.

Most business and personal users of small computers have to live with the thing on their desk, or in the family room, generally in a fairly conspicuous spot. It therefore has to look good. It should blend tastefully with the furnishings and decor, and should not totally dominate the area around it. When I first got my Lisa, for example, and mounted it on my desk, I realised that it formed a massive barrier between myself and the person on the other side. The only solution was to turn the desk around, against the wall.

This is the beauty of the Hyperion. It's a very compact package, primarily to meet the design goal of transportability, but it also looks extraordinarily good on a desk. And because of its small size, it is possible to talk across the top of it.

Designed For Ergonomics

The Hyperion was designed with ergonomics in mind. The screen is a high-resolution amber phosphor type which is very easy on the eye, and is surrounded with a grey bezel which assists the eye to adjust from the surroundings. To the right is a pair of disk drives, IBM-compatible of course, but nicely integrated with the machine, rather than a pair of black shadows.

The keyboard, which tucks under the machine when not in use, follows the 'corrected IBM PC' layout, and feels like a Keytronics type. One of the nice features about the machine is the synergy between keyboard and display. For

example, the programmable function keys are across the top of the keyboard in line with their labels on the 25th line of the display, so that it is easy to follow the softkey labelling. The 25th line also displays caps lock and numeric lock status, as well as the time.

The Hyperion's software utilities make extensive use of the softkeys to assist the novice or infrequent user. The IBM PC's mode command, for example, is comparatively unfriendly, while the Hyperion's is driven by the softkeys and works interactively through menus. Additional utilities are provided to allow customisation of the softkeys, including the ability to have a single softkeystroke shift to a new set of definitions, so that menu levels can be set up.

At power-up, the system generally allocates 120 Kbytes or so of memory to a RAMdisk drive, and a batch file transfers the most frequently used programs to it. This speeds up operation considerably. The size of the RAMdisk can be set by the user, and of course the batch file can be edited by the user.

The Hyperion is IBM-compatible to a considerable degree, and emulates both the IBM monochrome and colour display adapters. It also has both serial and parallel ports built in, and these are pin-compatible with the IBM.

While the Hyperion is not 100 per cent compatible (a dangerous position, as discovered by Corona), the people at Bytec publish a periodic list of software which has been tested and found compatible with the machine. This includes many programs which one might think very hardware-dependent, such as CP/M-86, and other popular programs such as MultiPlan. In some cases, Bytec has published application notes which tell the user (or dealer) how to patch the program to run correctly on the Hyperion.

For the core software which forms the majority of applications, Hyperion has opted to supply its own customised versions. Its word processor, IN:SCRIBE, makes extensive use of the programmable function keys, for example. For database management, the Hyperion is supplied with the Aladin relational database system, which is achieving a good reputation, while the operating system and language are MS-DOS and BASICA (GW-BASIC) respectively. In the financial area, Bytec has opted for the MultiPlan spreadsheet, and was also one of the first to offer Lotus 1-2-3 under its own packaging and label.

In the US and Canada, the Hyperion can be supplied with a built-in modem and autodialler, and moves are under way to have an 'Australianised' version of this type approved and released on the market shortly. The panel was able to view a pre-release version of this in operation, and was impressed with its ease of use and its 'smarts'. For example, the program knows that some numbers are ordinary phones and others have modems at the far end, allowing it to be used as a conventional autodialler. On data calls, when the machine detects carrier at the far end, it automatically enters terminal mode.

The Bytec Hyperion, runner-up in the Personal Computer of the Year Award, is an elegant machine that doesn't dominate the desktop or otherwise intrude on the environment.

Drawbacks

The major drawback of the Hyperion is its lack of expandability. The basic ▶

Specifications and Report Card

Unit:	Bytec Hyperion
Made by:	Bytec Corporation, Ottawa, Canada
Processor:	Intel 8088
Clock speed:	4.77 MHz
RAM:	256K
ROM:	BIOS, bootstrap and diagnostic only
I/O:	RS232C serial, Centronics parallel
Languages:	MS-DOS tongues
Keyboard:	84 keys, QWERTY + numeric keypad, 10 function keys
Display:	80 characters by 25 lines, amber screen
Peripherals:	—
Expansion:	Tower cardcase to allow hard disk and IBM-compatible boards
Best points:	Aesthetic appeal, portability, IBM-compatibility, one-year warranty
Worst points:	—

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

Extras included:	In Value Pack: Lotus 1-2-3, travel case, Inscribe word processor
Options:	EX expansion unit
Price:	$5995 incl. sales tax for Hyperion Value Pack; $5480 incl. tax for basic package
Review unit from:	Hyperion Computer Systems, 8th Floor, 275 Alfred St, North Sydney 2060. (02) 92-0729.

Bytec Hyperion

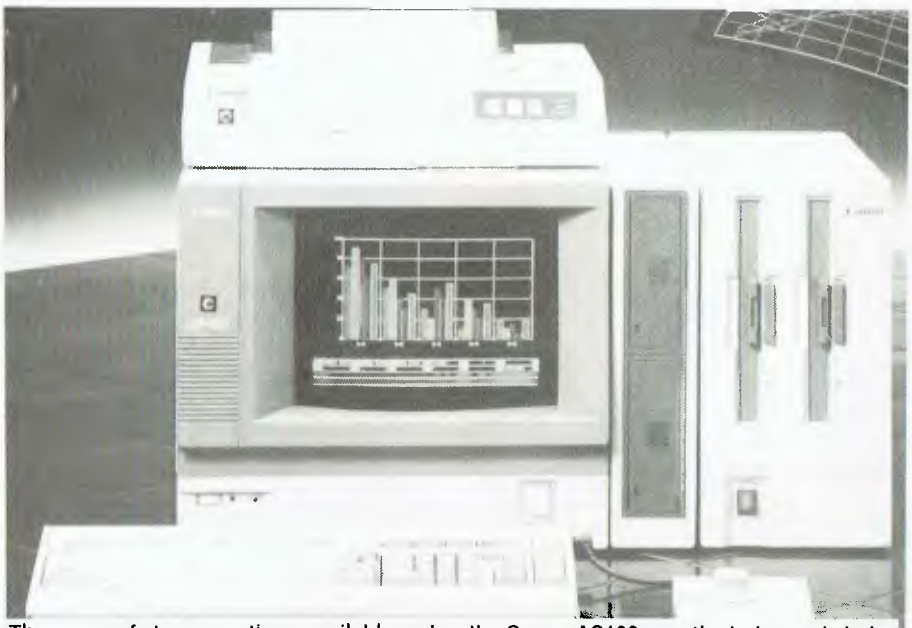
machine has 256 Kbytes of memory, which is enough for most applications except large spreadsheets. However, there is no expansion bus internally, except for an 8087 slot. This is fixed by an external box called the EX, which contains a 5, 10 or 20 Mbyte hard disk, streaming tape drive and seven IBM PC bus-compatible slots, all in a tower package which can sit by the user's desk. This may be a better choice than trying to mount a hard disk inside a portable; we are not yet convinced about the robustness of Winchesters in such circumstances.

Another, less significant, problem is that the Hyperion is still running MS-DOS version 1.1, rather than 2.0. This is perhaps due to the fact that its MS-DOS uses a memory layout that corresponds to IBM PC-DOS rather than the more common MS-DOS, but we would still like to see an upgrade to 2.0 ere long.

The Hyperion is therefore an excellent choice for those seeking an IBM-compatible machine, whether portable or desktop. Its packaging design is a particularly strong factor in its selection as a runner-up for the Award, though its strongly ergonomic design – both in hardware and also in software – is an added bonus. ❑

Canon AS100

The Canon AS-100 has not previously been seen in the pages of ***Your Computer****, and indeed does not have a particularly high profile outside certain areas. Yet it has much to commend it as a general 'mainstream' micro.*



The range of storage options available makes the Canon AS100 a particularly good choice for general business use.

The most striking thing about the AS-100 is its mechanical design, which simplifies set-up and installation. The CPU and memory are housed in the display cabinet, which is a cool grey box of simple lines. The disk drives are attached vertically to the right of this enclosure – a good arrangement for cooling, with the added advantage that the machine is not restricted to one disk drive arrangement.

In fact, Canon has three disk drive enclosures for this machine. The most popular will undoubtedly be the twin 13 cm drives, which have a capacity of 640 Kbytes each. For those who require more storage, but don't need the speed (or expense) of a hard disk, an enclosure containing two 20 cm double-sided double-density disk drives is available, which provides a capacity of 1 Mbyte per disk. This flexibility of storage options is a major benefit of the machine.

The 12" (30 cm) colour screen has a

Attribute	Weight	Lisa		Hyperion		PC-5000		Magnum		TI Prof.	
		Unw'ted	Weighted	Unw'ted	Weighted	Unw'ted	Weighted	Unw'ted	Weighted	Unw'ted	Weighted
Memory capacity	0.8	9	7.2	6	4.8	6	4.8	6	4.8	5	4
Disk capacity	0.8	8	6.4	5	4	5	4	7	5.6	5	4
Disk compatibility	0.5	3	1.5	7	3.5	7	3.5	7	3.5	7	3.5
Processor speed	0.8	9	7.2	6	4.8	5	4	9	7.2	6	4.8
Graphics	0.8	9	7.2	6	4.8	4	3.2	4	3.2	7	5.6
Graphics S/W support	0.8	9	7.2	6	4.8	3	2.4	3	2.4	6	4.8
Mechanical design	0.6	9	5.4	9	5.4	7	4.2	5	3	6	3.6
Electronic design	0.8	8	6.4	8	6.4	7	5.6	8	6.4	7	5.6
Construction quality	0.7	9	6.3	9	6.3	8	5.6	6	4.2	7	4.9
Software innovation	0.8	10	8	4	3.2	4	3.2	6	4.8	7	5.6
Software ergonomics	0.7	10	7	6	4.2	5	3.5	5	3.5	5	3.5
Keyboard ergonomics	0.7	8	5.6	7	4.9	5	3.5	4	2.8	4	2.8
Portability/utility	0.8	7	5.6	8	6.4	7	5.6	7	5.6	6	4.8
Value for money	0.8	8	6.4	7	5.6	6	4.8	6	4.8	6	4.8
Total weighted score			87.4		68.3		57.9		61.8		62.3

This table showing the relative attributes of the computers under consideration was in fact put together in retrospect to see how the judges' decisions corresponded with objective parameters. Each computer was given points out of ten for each attribute, and then the attributes weighted as shown to take into account their relative importance; this meant that the highest possible weighted score would

resolution of 640 by 400 dots, which is more than adequate for most business graphics, although the screen seemed to lose resolution and be slightly hazy, perhaps because of the optical qualities of the glass. Colours available are any eight out of a palette of 27 colours. A plain green screen is also available.

One of the best features of the AS-100 is its companion colour ink-jet printer, the A1210. This is capable of printing up to 640 dots/line (while screen-dumping the AS-100) in up to seven colours plus the white of the paper. Better still, it is whisper-quiet; we could hardly hear it in operation. The resulting graphs were of excellent quality; certainly up to presentation standards.

For those who prefer them, conventional dot matrix impact printers are also available, and Canon electronic typewriters can also be used for correspondence quality-printing. And, of course, the machine can be used with other brands of printer.

The processor is an Intel 8088, although it runs at only 4 MHz, making the machine a tad on the slow side. Memory is 128 Kbytes standard, upgradable to 512 Kbytes.

Range Of Software

A considerable range of software is available; some of it is generic stuff like WordStar and the other Star products, while some is Canon-specific. The machine runs both CP/M-86 and MS-DOS, giving access to a wide range of software for both operating systems.

However, Canon can also supply a range of specialised business accounting software for the AS-100, including income tax scheduling, depreciation system, office costing, file management system, debtors, stock, creditors, payroll and others.

Canon BASIC, which runs under CP/M-86, is an excellent BASIC for commercial work. It seems to be based on Microsoft BASIC, but has additional commands for matrix operations as well as an extended editor mode. For those who prefer it, GW-BASIC is also available under MS-DOS. Other languages include Level II COBOL, Pascal and FORTRAN.

For financial modelling, the machine is supplied with a program called CanoBrain, which is most notable for its graphics capabilities. This program is a combined spreadsheet calculator, database and graphics package broadly similar to 1-2-3, but with a very different feel. The spreadsheet is limited to 128 rows by 32 columns, which is adequate for many jobs, but it is a bit short on financial functions such as IRR and NPV. However, it is programmable, and also has some communications and word processing facilities.

In summary, the Canon is mechanically well designed, with a very high-quality display, and the option of 13 cm, 20 cm or Winchester disks. The software available for the machine makes it a good choice for general business use and particularly public accountants, and the technology in the colour inkjet printer is very attractive for both its high quality and silent operation. ❑

Specifications and Report Card

Unit:	Canon AS-100
Made by:	Canon Inc.
Processor:	Intel 8088
Clock speed:	4 MHz
RAM:	128K MOS-LSI standard
ROM:	Bootstrap
I/O:	Centronics port
Languages:	Canon BASIC, GW-BASIC, COBOL Level II, Pascal, FORTRAN
Keyboard:	77 keys + 12 function keys + five others
Display:	80 characters by 25 lines, 30 cm monochrome or colour
Graphics:	640 by 400 pixels (8 colours from 27)
Peripherals:	Printer, twin 13 cm disks
Expansion:	Up to 512K in jumps of 128K
Best points:	Range of disk drives, range of business software
Worst points:	Relatively slow

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

Extras included:	—
Options:	20 cm disks, Winchester drive, pointing device, colour printer, four I/O ports
Price:	$7250 incl. training and installation; $500 for each software module (incl. training); $4100 for 20 cm disk drives; $5100 for Winchester drive; $1844 for colour option
Review unit from:	Canon Australia Pty Ltd, 37 Waterloo Rd, North Ryde 2113. (02) 887-0166.

Attribute	Weight	Canon AS100		NEC PC-8201A		Tandy M100		Olivetti M10		Microbee	
		Unw'ted	Weighted	Unw'ted	Weighted	Unw'ted	Weighted	Unw'ted	Weighted	Unw'ted	Weighted
Memory capacity	0.8	5	4	6	4.8	4	3.2	4	3.2	8	6.4
Disk capacity	0.8	5	4	0	0	0	0	0	0	8	6.4
Disk compatibility	0.5	4	2	0	0	0	0	0	0	5	2.5
Processor speed	0.8	5	4	5	4	5	4	5	4	4	3.2
Graphics	0.8	6	4.8	4	3.2	4	3.2	4	3.2	6	4.8
Graphics S/W support	0.8	4	3.2	4	3.2	4	3.2	4	3.2	6	4.8
Mechanical design	0.6	7	4.2	6	3.6	6	3.6	6	3.6	6	3.6
Electronic design	0.8	6	4.8	7	5.6	7	5.6	7	5.6	6	4.8
Construction quality	0.7	7	4.9	7	4.9	7	4.9	7	4.9	5	3.5
Software innovation	0.8	5	4	6	4.8	6	4.8	6	4.8	6	4.8
Software ergonomics	0.7	4	2.8	6	4.2	6	4.2	6	4.2	5	3.5
Keyboard ergonomics	0.7	5	3.5	7	4.9	6	4.2	6	4.2	4	2.8
Portability/utility	0.8	5	4	8	6.4	8	6.4	8	6.4	7	5.6
Value for money	0.8	4	3.2	8	6.4	8	6.4	8	6.4	8	6.4
Total weighted score			53.4		56		53.7		53.7		63.1

be 104. The objective results corresponded remarkably closely to the judges' original decisions. (The Microbee's scores are included out of interest, as it was not in the running for Personal Computer of the Year.)

Sharp PC-5000

Like the milkmaid between two stools, the Sharp PC-5000 is isn't quite sure whether it's portable or transportable. The machine certainly couldn't be described as handheld, but it isn't as big as a desktop, either.

The Sharp PC-5000 is a powerful package featuring the unusual combination of standard MS-DOS operating system with bubble memory cartridges.

THE PC-5000 is a powerful package at only 326 by 305 by 87.5 mm, yet containing a 16-bit processor and having the ability to run MS-DOS 2.0. The package has a lid over the keyboard which folds back to reveal an eight-line by eighty-character liquid crystal display.

At the rear of the machine is an on-off switch, and there are also on/off buttons on the keyboard, but sometimes the latter did not work and we couldn't work out exactly why. There's also a program called OFF.COM which worked consistently.

The keyboard has an excellent feel – among the best of the machines surveyed – and is well laid out. Above the keyboard is a slot into which plugs a 128 Kbyte bubble memory module. This is the machine's main mass storage device, which acts as a replacement for a disk drive.

A pair of disk drives are also available, but obviously are not as portable as the machine itself, relying as they do on mains power.

At the rear of the machine are connectors for serial I/O, RS-232C to a modem or printer, disk drive, cassette recorder and power. The machine's internal lead acid battery is rechargeable, of course. An internal real-time clock runs continuously.

The operating system is MS-DOS 2.0, and is a full implementation of that system with all its commands and hierarchical directories. On powering up, the system boots up into MS-DOS, and will automatically execute the AUTOEXEC.BAT file if one is present. This feature is used to advantage with some of the bubble cartridges which carry the SuperComm menu program.

The standard software supplied for the machine is MS-DOS and BASIC (in ROM). The underside of the machine has two recessed sockets which can carry 64K RAM modules, though one of these is normally used for the ROM BASIC. With 128 Kbytes of internal RAM, this means that the machine can be expanded to 256 Kbytes in total.

The processor is an 8088, which means that the wide range of generic MS-DOS software is available to users. However, Sharp has obtained the range of Sorcim software for the PC-5000, including SuperWriter and SuperCalc. Both these programs are run from a main menu called SuperComm, which is automatically invoked from the AUTOEXEC.BAT file, so that the user is insulated from the operating system.

Which leads us to one of our major difficulties with the PC-5000: bubble swapping. The Super programs are too big to fit on one bubble package, so they are split up. The question was: is it safe to remove and insert bubble packs with the power on? The manual was none too clear on this point, but after deciding that there was no other way to run the programs we tried it, with no ill effects.

The bubble memory cartridges, coupled with the use of MS-DOS, are a real breakthrough. Previous machines which used bubble memory have generally used a proprietary operating system and have been very expensive; the combination of a standard DOS and relatively inexpensive ($300) bubble memory packs is very much more attractive. Although $300 may seem expensive, one should not need very many of them; bear in mind that the machine also has a cassette interface which can be used for even lower-cost mass storage. Thus the bubble can be used for operating system and program storage, and data shunted off-line to cassettes.

Unlike ROMs, the bubble memories can be re-written in exactly the same way as disks. This means that software distributed on bubbles can be updated, so that one is not stuck with bugs. In fact, since bubble memories can be erased, Sharp distributes disks along with bubbles containing distribution software, so that users always have a back-up from which the bubble can be restored.

The Super series of software works well and is a mature product which is relatively free of bugs. SuperWriter is actually based on Magic Wand, and thus has a distinguished heritage. SuperCalc has for long been the standard for CP/M spreadsheet calcs; the SuperCalc 2 version has additional features for consolidation, data manipulation and data interchange.

Video Display

The eight-line screen limitation does not seem to be as serious as we at first feared; all the programs worked quite well. MS-DOS utilities which provide paged output (such as DIR/P) knew about the screen size. One limitation of the PC-5000 is the absence of any video display output; the ability to couple into a video monitor when one is available would be a major bonus.

However, the integrated LCD display ▶

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Sharp PC-5000

worked well. The display swivels on its mounting arms, allowing the angle to be varied to suit nearby light sources. A contrast control on the side of the unit allows the LCD to be adjusted further. The display supports dot-addressable graphics with a resolution of 640 by 80, and this is directly drivable from BASIC.

The built-in printer is particularly ingenious. It works with single sheets of either bond paper or special thermal paper. The printhead in both cases operates thermally, but for bond paper a thermal ribbon is used. The print quality is very good in both cases; certainly better than can be expected from a portable unit. The major limitation of the printer is probably the strain it places on the battery, shortening its life. In general, approximately ten hours' operation can be expected in typical usage.

In Japan, a companion modem is offered, which includes a numeric keypad and fits behind the display in the lid of the machine. This modem does not meet the CCITT standards which Australia uses, but Sharp Australia is working on the problem and is organising a companion modem locally.

A dual disk drive is now available for the machine, which has a capacity of 360 Kbytes per disk and is IBM-compatible. It might be more accurate to say that it is MS-DOS compatible, since the machine can obviously not run IBM PC programs, but it does have the major advantage of being compatible with the outside world – a first for portable machines like this one.

Specifications and Report Card

Unit:	Sharp PC-5000
Made by:	Sharp Corp.
Processor:	Intel 8088
Clock speed:	Not specified
RAM:	128K + 128K bubble memory
ROM:	192K
I/O:	RS232C, cassette
Languages:	GW-BASIC
Keyboard:	Full QWERTY + eight function keys
Display:	80 characters by eight lines, LCD
Graphics:	640 by 80 pixels
Peripherals:	Printer
Expansion:	Up to 256K RAM
Best points:	Bubble memory
Worst points:	—

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

Extras included:	—
Options:	—
Price:	$2700; $750 for printer; $35 for battery pack; $1750 for twin 13 cm disk drives plus controller; $300 for each bubble memory pack; $220 for external RAM
Review unit from:	Sharp Corporation of Aust Pty Ltd, 64 Seville Rd, Fairfield 2165. (02) 728-9111.

The machine does suffer from a few limitations from the ergonomic viewpoint; for example, there is no carrying handle, which for a machine of this weight (5.8 kg) is a serious omission. Even a cloth carrying case with a handle would be a great improvement. Another, less serious, problem is the need for two hands to open the display lid. A major market for this type of machine is the handicapped, many of whom would have difficulty with what would otherwise be an ideal machine.

The major advantage of the PC-5000 is its bubble memory, which offers non-volatile storage without the heavy power drain of floppy disks. The bubbles are convenient, work well, and are formatted in the same way as disks, so that data can be transferred between the two media. Add to this the fact that it is MS-DOS compatible, and one can see why this machine represents a breakthrough in portable computers. ❑

TI Professional Computer

Texas Instruments' Professional Computer is inspired by the IBM PC rather than being a clone, and exhibits quite a few superior features to its 'mentor'.

FIRST OF ALL, it is perhaps necessary to point out that the recent closure of Texas Instruments' home computer division has nothing to do with the division that produces the Professional Computer. In fact, it is probably called the Professional Computer specifically to highlight this fact.

The TI Professional is not exactly a clone; it would be more accurate to describe it as inspired by the IBM PC. Rather than blindly trying to copy the PC, TI's engineers have instead opted not to be compatible where they could provide superior performance. In particular, the Professional offers much better graphics than the PC, with a resolution of 720 by 300 (as against 640 by 200). The result is much sharper colours, and on the unit we examined, better colour saturation.

While the Professional is able to read IBM PC data files, it is not software-compatible with the PC – its hardware is too different. Realising the dangers of a dearth of software through not following the leader, TI marketing staff have gone to some lengths to ensure a supply of good software, such as Lotus 1-2-3, EasyWriter II, MultiPlan and other packages.

In particular, TI has made sure it has a chance in the corporate market by supplying 3780 communications, so that the machine can communicate with large IBM mainframes.

Speech Command System

But perhaps the most impressive feature of the Professional (though of limited use in Australia) is the Speech Command System. This is an add-on board and software which couples the machine to either a telephone, headset or microphone and the machine's internal speaker.

The machine can now store digitised speech and can recognise various words and phrases. TI has worked this into a number of practical applications. For example, the Transparent Keyboard utility translates spoken words into keystrokes, allowing unmodified MS-DOS ▶

TI Professional Computer

applications programs to be driven from the microphone or telephone. Thus MultiPlan, 1-2-3 or other programs can be voice-driven.

Additional applications include a telephone answering service which can record incoming calls (up to 15 mins/floppy or four hours on a 5 Mbyte Winch) and play them back to any touch-tone phone; a dictating machine; a program which can record a message and then relay it in up to ten out-going telephone calls; a speed dialler and autodialler, plus numerous other telephone enhancements. While the majority of these telephone-related applications are subject to Telecom approval here in Australia – and probably won't work in the majority of pulse-dialling installations anyway – there is still plenty of scope for this system in any professional office.

The Speech Command System board, by the way, has its own 32-bit dedicated processor, which sounds more powerful than the machine's main 8088; however, it is dedicated to this application. The Speech Command System is a terrific example of the ways in which personal computers can be made much more useful – think of the possibilities for the disabled alone.

Configurations

The Professional is available in a number of configurations: the base model has 128 Kbytes and a single disk drive, and this can be upgraded by adding either floppy or Winchester disks, more memory and various add-ons. Seven slots are available for option boards, although two of them will accept only short boards. Up to a megabyte of memory can be used in the system, though how address bus contention is avoided is not clear.

The colour display has a resolution of 720 by 300, as mentioned above, which gives much better circles and diagonal lines. Eight colours are available.

The keyboard has both good and bad points: the layout is excellent, with a separate, well laid-out cursor pad, and function keys across the top where they can be clearly labelled. On the other hand, the action is terrible: if the keys are not hit directly from above, they tend to stick. If it wasn't for that, the action would be good, with a pleasant feel. Why are TI computers always let down by their keyboards?

The TI Professional Computer features the innovative Speech Command System, which permits the machine to store digitised speech and recognise various words and phrases.

The review model was supplied with a 10 Mbyte Winchester drive, labelled as drive E:, and this was loaded with games and demo software, including Lotus 1-2-3, EasyWriter II, GW-BASIC, graphics demos and others. The colour graphics were particularly impressive, particularly a giant rolling ball on a blue background, an effect achieved by switching paint-pot registers in the graphics controller, but impressive nonetheless.

Like the Hyperion, the TI runs a version of MS-DOS 1, not the 2.0 which most manufacturers have now adopted. I dare say it won't be long before an upgrade is offered, however.

The documentation for the Professional is lavishly produced, after the IBM fashion, printed in two colours and bound in cloth slip-cases. The design is good, the information comprehensive and the layout not too intimidating to the beginner.

The TI Professional is a competent reworking of the ideas that made the IBM PC a success. Where possible, TI has improved the winning formula without totally divorcing the machine from the mainstream of MS-DOS action. However, the TI is distinguished by its excellent graphics, its software, and the speech recognition technology which points the way to future developments. ❑

Specifications and Report Card

Unit:	TI Professional Computer
Made by:	Texas Instruments Inc.
Processor:	Intel 8088
Clock speed:	5 MHz
RAM:	128K standard
ROM:	8K
I/O:	Parallel printer port
Languages:	MS-BASIC, COBOL, FORTRAN, Pascal
Keyboard:	97 keys, detachable
Display:	30 cm monochrome or 32.5 cm colour, 80 characters by 25 lines
Graphics:	720 by 300 pixels
Peripherals:	13 cm floppy, 5M or 10M Winchester
Expansion:	Up to 1M RAM
Best points:	Excellent graphics, speech input
Worst points:	—

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

Extras included:	—
Options:	Three-plane graphics, communications, Z80 CP/M card, 5M or 10M Winchester, speech board, printer
Price:	$3875 for basic unit; $200 for each 64K extra; $675 for extra drive; $3150 10M Winchester; $290 communications board; $920 for printer; $1395 for colour monitor; $455 for three-plane graphics; software packages $200-$450.
Review unit from:	Texas Instruments, 6 Talavera Rd, North Ryde 2113. (02) 887-1222.

Three of a Kind

Tandy's Model 100 was the first of three machines which placed the panel in a quandary. The machine, a true portable which could virtually be described as handheld, is made in Japan by Kyocera, and different versions of the same machine are marketed by NEC (the 8201) and Olivetti (M10).

Top: Olivetti M10; middle: Tandy Model 100; bottom: NEC PC8201A — all made by Kyocera in Japan.

AFTER DELIBERATION, the judges decided that they would have to consider all three machines together for the award, as they are all so similar. In the event, since all the machines are made by the same company, and the different versions reflect different marketing strategies rather than design competence on the part of the vendors, all three would have to be treated equally.

For those reasons, the following comments, unless specifically excepted, apply to all three machines – the Tandy Model 100, the NEC PC-8201A and the Olivetti M10.

They are small machines, measuring just 51 by 302 by 216 mm, and weighing just 1.79 kg. Most of the top surface of the machine is occupied by the keyboard, which is a full action type with a very pleasant feel; in fact, among the best evaluated. There is not room for a numeric keypad, but there is a num lock key which turns an area of the keyboard into a numeric pad.

Immediately above the keyboard are the function keys, and here the machines differ. The Tandy and Olivetti follow the same layout, with four sets of four keys in a row – a layout that is less than perfect for cursor movement keys – while the NEC arranges them as a square, which is closer to the ideal.

The remaining keys in the row are eight function keys, plus four editing keys. Here the NEC takes a step backwards again by having only two keys with shifted function keys. Swings and roundabouts . . .

Above the keyboard is an eight-line by forty-character liquid crystal display. While a forty-character line may seem a bit limiting, the software manages the screen well, using such facilities as word-wrapping, so that it is not too much of a problem.

The machine revolves around the display, and the three machines have different ways of coping with the problem of light reflection. All have a potentiometer on the side which alters the display contrast, but they differ physically. The Tandy M100 has a simple flat top, which is good for lap use but not quite so good on a desktop. The NEC PC-8201A has a sloping surface, which is a good com-▶

Three of a Kind

promise and is quite usable, while the Olivetti M10 has a tiltable display panel which seems like the best solution – only then they spoilt it by covering it with a highly reflective plastic panel! All could benefit by using some polarised filter and anti-glare material.

Interfacing

The three machines differ in their interfacing capabilities. All the machines have at least one RS-232C and one parallel printer port, a cassette tape interface, and a barcode reader interface. The NEC also has two other connectors for unspecified expansion purposes, although since they are US phone jacks, it is not difficult to make a guess. The NEC also has a large slot at the side for an external memory module, while the Olivetti has a flap on the underside covering an expansion bus connector.

One annoying thing about the Tandy is that the surround of the RS-232C connector is so close that it will not accept most RS-232 plugs with their shells on. Tandy will no doubt counter that it accepts a Tandy connector.

The machines also vary in memory capacity. Both the Tandy and the Olivetti start with 8K of memory and increase to 32K (the Tandy is also available in a 24K version). The NEC starts at 16 Kbytes and can be expanded to contain three banks of 32K – one of which is in the external RAM pack.

Other differences are mainly to do with the positions of switches, memory power switches and the like.

Similar Software

In terms of software, again, the machines are similar. All have the same Microsoft BASIC and simple word processor, but the Tandy and the Olivetti both also have simple address and scheduler programs, which are really nothing more than the 'find' command from the word processor.

All the companies who market these machines in Australia are making serious efforts to build up a software base for the machines. All have barcode reader programs, simple spreadsheets, accounting programs and the like in copious quantities. In fact, these little machines are shaping up to have more software than many bigger machines.

For further expansion, NEC has a matching printer and a data cassette deck which features a fast forward search facility. Tandy, on the other hand, has announced (in the US) a disk/video interface that contains a disk drive (184 Kbyte capacity) and a video circuit with 25 lines of 40 or 80 characters.

All the machines are light in weight and very comfortable to use.

These machines are popping up all over the place – we have even seen people taking notes at seminars with them! Because the panel found it difficult to distinguish between the machines, except for the NEC's additional memory and cursor keys, we suggest that potential buyers should examine all three and buy after finding the one that suits them best. ❑

Specifications and Report Card

Unit:	Tandy M100
Made by:	Kyocera, Japan
Processor:	80C85 CMOS
Clock speed:	2.4 MHz
RAM:	8K or 24K
ROM:	32K
I/O:	RS232C, cassette, parallel printer interface, barcode reader port
Languages:	BASIC
Keyboard:	QWERTY + 16 function keys
Display:	40 characters by eight lines, LCD
Graphics:	240 by 64 pixels
Peripherals:	Cassette recorder, barcode reader, printer
Expansion:	Up to 32K RAM
Best points:	Light weight, barcode reader
Worst points:	—

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

Extras included:	—
Options:	—
Price:	$1099 with 24K RAM; $899 with 8K RAM; $119.95 for 8K modules
Review unit from:	Tandy Australia, 91 Kurrajong Ave, Mt Druitt 2770. (02) 675-1222.'

Specifications and Report Card

Unit:	NEC PC-8201A
Made by:	Kyocera, Japan
Processor:	80C85 CMOS
Clock speed:	2.4 MHz
RAM:	16K standard
ROM:	32K
I/O:	Cassette, RS232C, barcode reader port, Centronics printer port
Languages:	BASIC
Keyboard:	QWERTY + nine function keys
Display:	40 characters by eight lines
Graphics:	240 by 64 pixels
Peripherals:	—
Expansion:	Disk, video monitor, printer via PC-8801
Best points:	Lots of memory, expansion
Worst points:	—

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

Extras included:	—
Options:	Barcode reader, cassette
Price:	$1095 incl. applications kit; $482 32K RAM module; $129 per 8K internal memory; $226 printer; $138 cassette fast find
Review unit from:	NEC Information Systems Australia, 99 Nicholson St, St Leonards 2065. (02) 438-3544.

Specifications and Report Card

Unit:	Olivetti M10
Made by:	Kyocera, Japan
Processor:	80C85 CMOS
Clock speed:	2.4 MHz
RAM:	8K or 24K
ROM:	32K
I/O:	RS232C, cassette, parallel printer interface, barcode reader port, modem
Languages:	BASIC
Keyboard:	QWERTY + 16 function keys
Display:	40 characters by 8 lines, LCD
Graphics:	240 by 64 pixels
Peripherals:	Cassette tape unit, barcode reader, acoustic coupler, micro-plotter (all portable)
Expansion:	Up to 32K RAM
Best points:	Portability, angled display, barcode reader
Worst points:	—

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

Extras included:	—
Options:	—
Price:	8K — $890 + $79 sales tax; 16K — $995 + $90 sales tax; 24K — $1195 + $98 sales tax; 32K — $1320 + $109 sales tax
Review unit from:	Olivetti Aust Pty Ltd, 140 William St, Sydney. (02) 358-2655.

SPECIAL COMMENDATION

Microbee - You've Come a long Way, Baby

Owen Hill is one of the grand old men of microcomputing in Australia. His first involvement with micros came in 1976, when his company, Applied Technology, produced a kit for an ASCII computer terminal. From then on, he just kept on going ...

FROM THAT FIRST terminal, Applied Technology went through a range of micro-based products: simple evaluation boards, experimenters' kits, to an S-100 bus-based system. After settling on the Z-80 CPU, AT went through a phase of software development; mainly games, but also MicroWorld BASIC and other serious systems software.

As the software base grew, Owen started thinking about how the same technology could be made more affordable. Obviously the S-100 bus design was too expensive; what was the minimum design?

And so the MicroBee was born. Originally intended to be the machine with the minimum cost and complexity which could still run the software developed for the AT S-100 machines, from very early days it developed its own personality. Now the S-100 machines have gone completely, merely a transitionary phase while the MicroBee emerged from its cocoon.

The original Bee was a small machine: BASIC in ROM, 16 Kbytes of RAM, a 64 by 16 video display and a simple low-cost keyboard. But also inherent in the design was a lot of potential for expansion: parallel printer port, a serial port for communications or networking, more memory, colour.

The Education Market

Most importantly, the MicroBee was developed with the requirements of the NSW Education Department in mind; at the original price of just under $400, schools were quick to catch on, and the MicroBee has captured a major share of the education market.

Several design features of the original MicroBee assured its success. The use of CMOS memory with battery back-up alleviated the tedium of cassette tape storage; the same memory was priced right for low-cost assembly; its Z-80 processor enabled a lot of software to be made available quickly; and it was the first major low-cost Australian product which attracted local software developers – not just of games but also applications software. In short, it has spawned an industry.

Not content to leave the product alone, AT continued development, on both the software and hardware fronts. Later Bees incorporated an editor/assembler in ROM, as well as a very good word processor. At the same time, more memory has been added (currently the biggest machine is 128K), as well as colour video and disk drives.

Through astute purchasing in Hong Kong, together with shrewd deals on software, Applied Technology is now able to supply a complete two disk drive 64K CP/M system, with word processing, spreadsheet and database management software, and 80 by 24 video monitor, for under $2000. Even the Taiwanese can't compete!

In examining the MicroBee, the panel took into account the entire history of the product to the present. It must be admitted that the early success of the MicroBee took Applied Technology (and the rest of the industry) by surprise, so that early problems with the machine took longer than expected to resolve. As the product continued to grow, the backlogs became even more difficult to clear. Yet AT has stood behind the product, and support for end users is now gradually improving.

This must be placed in the correct perspective; nobody in Australia had ever had to cope with this kind of growth before. Even the computer magazine industry has not grown as fast as Applied Technology had to in those days. Coupled with the lack of experience in the local industry generally, we feel that AT put in as creditable a performance as could reasonably be expected.

New Bee In The Hive

The machine supplied for evaluation was the latest in the range, with new software. The machine had 128K of memory, two 400 Kbyte disk drives, the CP/M operating system and an 80 by 24 video display. Applications software included WordStar, MultiPlan, HBASIC and other general-purpose utilities. The system worked flawlessly during the evaluation period. The display was crisp▶

SPECIAL COMMENDATION

Microbee

and clear, and the keyboard had a good feel. The disks were quick and well-nigh silent in operation, and the whole system worked well.

The major new feature was the icon-driven replacement for the CP/M CCP (console command processor). This allows the user to select an application by merely typing a single digit – in the case of the major applications – or by moving the cursor around a screen directory display and then hitting return. The system is very easy to use, particularly for those with no typing ability.

After reviewing the system, at least one panel member went away convinced that he should recommend the MicroBee to a client for a general-purpose word processing and database management application!

The only problem discovered by the panel was a disturbing screen flicker whenever the processor accessed the screen RAM. This has been a problem with AT video displays since time immemorial.

As mentioned above, the Bee has been tremendously successful in the education market, as well as in the general home and small business markets. It has spawned a small software industry of its own in Australia, and it may surprise readers to learn of its export success as well.

The Bee is now being sold in the UK, the Scandinavian countries and Israel. We know this, not because Applied Technology told us (though they proudly did), but because the magazine's bulletin board system has logged phone calls from these countries; quite a few of them, too, all using Microbees.

In short, Owen Hill is doing for Australia what Clive Sinclair has done in Britain.

Therefore, in recognition of the continued development of the MicroBee to its current sophisticated level, for continuing to offer excellent value for money, and for unparalleled success in the domestic and export markets, we award the Special Commendation for Australian Hardware to Applied Technology. ❑

The all-Australian Microbee, winner of the Special Commendation for Australian hardware.

Specifications and Report Card

Unit:	Microbee
Made by:	Applied Technology
Processor:	Z80A
Clock speed:	3.75 MHz
RAM:	8K, 16K, 32K, 64K depending on model
ROM:	28K
I/O:	RS232C, parallel port, cassette
Languages:	BASIC
Keyboard:	Full QWERTY
Display:	80 characters by 24 lines (or 64 by 16)
Graphics:	512 by 256 pixels, PCG
Peripherals:	—
Expansion:	Disks
Best points:	Very functional, excellent value, Australian
Worst points:	—

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

Extras included:	—
Options:	Networking, CP/M, monitor, modem, printer
Price:	$399 — Experimenter 8K RAM machine; up to $1495 for 64K RAM (incl. CP/M 2.2, Wordstar, Multiplan, MS-BASIC); $1795 for twin 13 cm drives
Review unit from:	Applied Technology Pty Ltd, 1a Pattison Ave, Waitara 2077. (02) 487-2711.

Dulmont Magnum

Of all the machines evaluated, the most recently designed was the Dulmont Magnum, a fact that is reflected in its ambitious technical design and high performance.

THE MAGNUM is fundamentally an Australian project, with both hardware and software designed in Australia and the machine manufactured in Hornsby, NSW. The project was originally conceived as a portable computer, and early in the design it was realised that this need not preclude high performance.

Weighing in at just 3.5 kg, and measuring 305 by 280 by 51 mm in the closed position, the Magnum is a true portable computer, capable of operation off the internal battery pack. The keyboard cover folds back to reveal the 80-column by eight-line liquid crystal display, which can be adjusted to a convenient angle.

The keyboard has a very short travel and is very sensitive; it will not appeal to those used to more conventional keyboards – but then, keyboards are largely a matter of taste. At the top of the keyboard is a row of user-definable function keys, of which the supplied software makes extensive use.

At the top of the keyboard are the on/off and reset keys; the Magnum power circuitry is electronically controlled, and in fact the computer shuts down be-

Dulmont Magnum

tween keystrokes if not required to do anything else. The display contrast is also controlled by the processor, rather than by an analogue potentiometer; this means the contrast is always set to the wrong level at power-up. It should really be stored somewhere in memory.

The processor is an Intel 80186, which is a true 16-bit processor, and is considerably faster than the older 8086. It also contains a number of support circuits which were previously external chips, and it is this that makes the Magnum's compact design and high performance possible.

The machine contains 128 Kbytes of ROM containing the MS-DOS 2.0 operating system, and two 128 Kbyte ROM packs can be plugged in, carrying applications programs. The machine can contain up to 256 Kbytes of CMOS battery backed-up RAM, although the standard machine contains 96 Kbytes. In practice, the standard machine is a bit limiting, as there is not enough space to run programs and use memory as a disk drive as well.

Expansion ports include two serial ports, a parallel port and a system expansion bus.

A real-time clock circuit is standard, and this is used by one of the most interesting pieces of built-in software, the clock/calendar/diary. This program is able to keep track of multiple time zones, display calendars for any month and any year (within certain limits, obviously) and keep track of appointments.

Available Software

Other software available for the machine includes the MagCalc spreadsheet calculator and the MagWriter word processor, both locally written programs. Both seemed to work quite well on the simple tasks we attempted. Also supplied was MagTerm, a communications terminal emulation utility.

One major advantage of the Magnum over the other portable computers evaluated is its built-in video display circuitry, which can generate an 80 by 24 display. This ups the power consumption, but then power is always available, unless using a battery-powered monitor. Quite a lot of portable computer use will in fact be at a base location, and it is as well to bypass the compromise of the eight-line display.

The Dulmont Magnum — it encountered a few early hitches in the race to get the machine on the market.

Also available is a dual 360 Kbyte disk drive enclosure which also carries additional memory – 128 Kbytes is standard, with expansion to 256 Kbytes possible. The drives are, of course, IBM PC format-compatible. This expands the capabilities of the Magnum still further.

There are a couple of limitations to the machine: a handle would be a great advantage, as its smooth finish and rounded edges make it a trifle difficult to grasp. And as we mentioned earlier, the launch and early introduction of the Magnum fell victim to the lack of experience we suffer in Australia, with confusion over pricing and the memory capacity of production machines. For example, after *YC* had been assured by the Managing Director of Dulmont that the latest price for memory upgrades was final and correct, it changed yet again. The result was a number of unhappy customers, though everything has now settled down.

As the Award was being judged, Terry Crews, Marketing Manager of Dulmont, was overseas negotiating international distribution of the Magnum, and it is expected to do well in overseas markets.

The judges considered the Magnum in both hardware categories: both as a candidate for the Personal Computer Of The Year Award and for Special Commendation for Australian Hardware. In the first of these, it was unfortunately overshadowed by the Lisa; in the second, the judges concluded that the MicroBee was a more successful and mature product. Thus the Magnum lost out in both cases. However, the panel wants to encourage Dulmont by reminding them that the Magnum will be eligible for consideration again next year for Special Commendation, when we will be most interested to monitor its progress. ❑ ▶

Specifications and Report Card

Unit:	Dulmont Magnum
Made by:	Dulmont Electronics Systems
Processor:	Intel 80186 CMOS
Clock speed:	8 MHz
RAM:	96K standard internal, expandable to 256K
ROM:	128K
I/O:	Two serial ports, one parallel port, bus expansion
Languages:	MS-BASIC, other MS languages
Keyboard:	Full QWERTY + 12 function keys
Display:	80 characters by 8 lines, LCD
Graphics:	480 by 64 pixels
Peripherals:	—
Expansion:	Up to 256K RAM internal plus 256K external
Best points:	Very fast, scheduling program, Australian
Worst points:	—

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

Extras included:	Two ROM packs with MagWriter and MagCalc
Options:	Monitor, printer, twin disks plus controller
Price:	$2495; $1995 for twin 13 cm floppies plus 128K RAM
Review unit from:	Dulmont Electronics Systems, 1st Floor, 148 George St, Hornsby 2077. (02) 477-6444.

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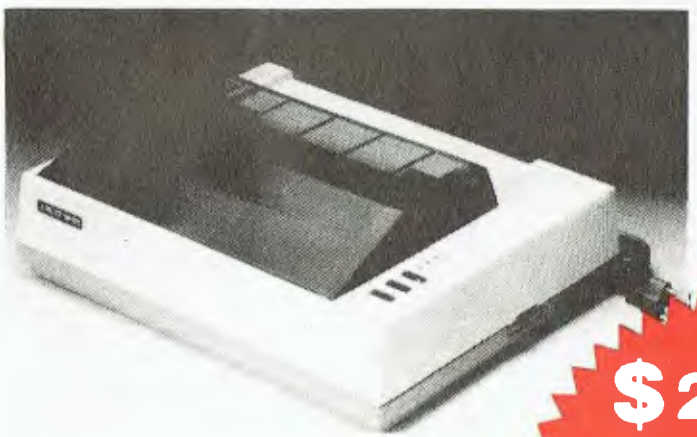

Hello again,

What a February that was! We sold so many of these printers the manufacturers offered us a price reduction. We didn't even have to ask! So we are passing the savings on to you again.

Incidentally, to avoid cofusion with all those expensive names (you should know by now they're all the same printer) we have called it the MicroEducational DT80 and have arranged stocks through till April.

New arrivals include some very nice lockable disk boxes at $35 (hold over 100 disks), TEAC Super 5 drives ($299 ex, $339 inc) and, of course MicroEducational disks (same as Le Floppie by Control Data).

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That's me.

George.

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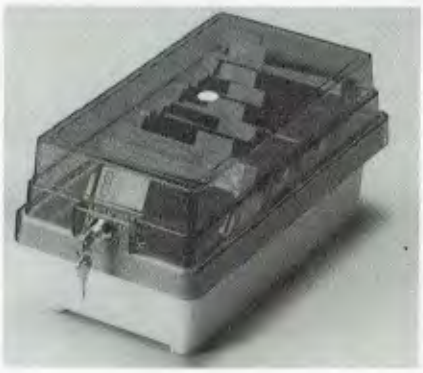

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- 5¼" hard drive 11.0 MEG formated (MD II)
- 2x RS232 Serial and 1x Centronics (MD2, MD3) plus high speed port (MD II)
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SOFTWARE SPECIFICATIONS

- CP/M 2.2 operating system.
- WORDSTAR — word processing
- NEW WORD — MD II
- CORRECT IT — Spelling checker
- LOGICALC — Electric spread sheet
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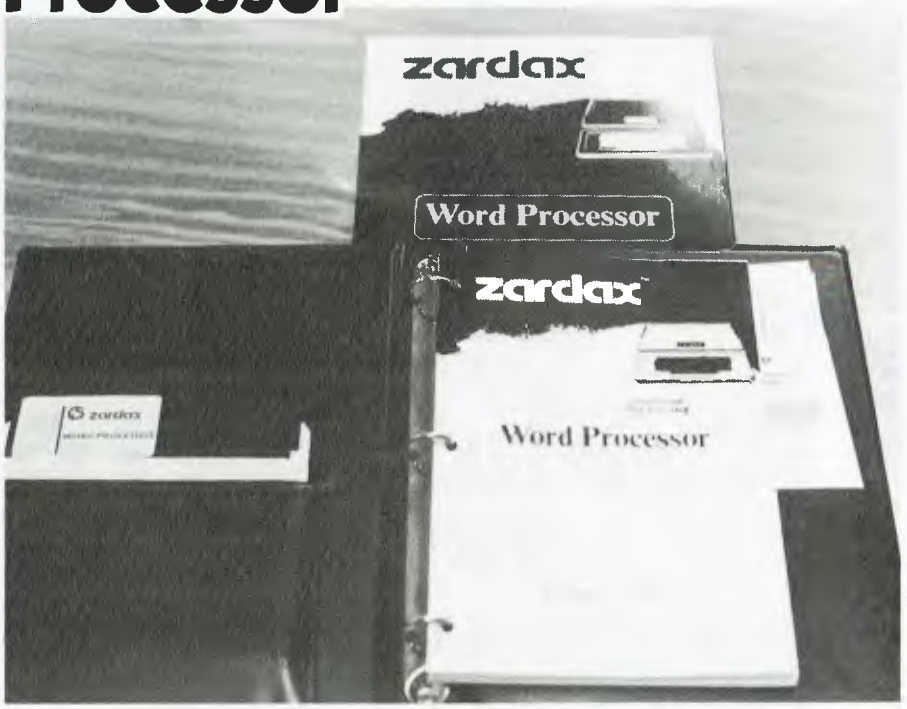
SPECIAL COMMENDATION

Zardax Word Processor

Zardax is that rare thing, a word processor that most people agree is neither too difficult to use, nor too simplistic to be useful. This is a rare achievement; it is widely known that word processor users can never agree about the merits of their respective programs.



Zardax word processing software for Apple II+ and IIe computers — a worthy winner of the Special Commendation for Australian software.

ZARDAX IS produced in Mt. Gravatt, Queensland, by Computer Solutions, a company started by Ian Phillips, the original author of the program.

The program runs on the Apple II+ and IIe computers, with or without 80-column cards, although the II+ will require a keyboard modification to produce lower case. Only one disk drive is required. On the standard Apple, Zardax produces lower case characters by using the graphics screen, while 80-column cards generally are able to produce lower case directly. A number of keyboard modifications are suggested in the manual; basically this handles all the various kinds of Apple that have been released since the very early models.

Upon booting, the Zardax program displays a main menu, together with a list of the documents currently on the master disk. This menu allows the user to execute commands such as create, print, transfer and delete – the major commands. By hitting escape, the inner menu is revealed, which contains commands such as change, draft, main menu, print, videoprint and others.

Zardax belongs to the the 'print-time formatting' school of word processors. In other words, you type in your text without regard to margin widths, spacing or layout, and the program sorts it all out as it prints the document. Thus to see how your document looks, choose videoprint at the inner menu, and the program 'prints' it to the screen.

The program supports a wide range of printers – everything from simple dot matrix types to Diablo daisywheels.

Regular users of Zardax have nothing but praise for the program. It is as near bug-free as one is likely to see in this kind of product; and those who encountered bugs in earlier versions compliment Computer Solutions on their sane and sensible upgrade policy.

Anyone Can Use It

Perhaps the best feature of Zardax is its consideration for beginning or occasional users. It is possible to use Zardax without being aware that a whole range of more sophisticated commands exists. The awareness that a system has more commands than ever seemed possible is probably more offputting than any other feature of complex word processors.

In addition, Zardax wins praise for being well-nigh bulletproof. It does not allow the user to accidentally lose text that they have just spent two hours typing. In general, it errs on the cautious side.

For those who are more adventurous, there are lots of commands in the system to control justification, pitch control, line spacing, centring, tabbing, cutting and pasting, boilerplating of text from disk files, and block moves and deletions. For example, moving a paragraph up in a document is simply a matter of placing the cursor somewhere within the paragraph and pressing <apple>-M. Zardax will respond with 'MOVE U/D?'; pressing U moves the paragraph up and D down.

The program includes a sophisticated glossary facility which allows up to 26 commonly used phrases to be stored in a file and placed into text with just a couple of keystrokes. Multiple glossary files may be maintained for more complex applications.

The program will automatically perform merge-printing of names, addresses or other variable information, either from the keyboard or a disk file.

The documentation for the program is very good indeed; in keeping with the orientation of the program it starts out with simple tutorials and gradually increases in complexity, until by the reference section it is happily dealing with internal details, interfacing with other programs and setting up parameter files and drivers.

Most importantly, from the point of view of this Special Commendation, Zardax has been commercially successful; it has met with the approval of thousands of users all over Australia. Most significantly, it has done so against imported programs which are direct competitors.

Best of all, Zardax is now on sale in the US and doing very well. It has received excellent reviews from the press and users alike, and is now taking the battle back to the land of its primary competitors.

For this achievement, the panel chose to give a Special Commendation for Australian Software to Computer Solutions for Zardax.

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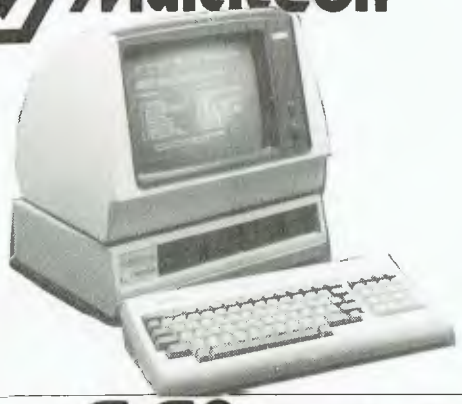

MIC-504

OFFICE POWER

- The MIC-504 is a 64K single board computer based on the Z80A microprocessor.
- Two 5.25 inch double sided, double density, floppy disk drives provide 2 Megabytes of on-line storage.
- MIC-504 comes with a package of software that includes Word Right, Spell Right, Magic worksheet, Qsort, Analyst and name and address.
- The operating system is CP/M 2.2 which makes the large library of existing software available for immediate application.
- Two full duplex RS-232C serial ports and one parallel port with a centronics interface enables expansion of the system.
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SPECIAL COMMENDATION

Attache

Attache software is a local success story. A joint development of Admin-EDP and O'Reilly Computers, it pioneered the concept of 'cash and carry' software.

Attache accounting software — a complete package that lets the user get down to work immediately.

ATTACHE IS A general-purpose accounting system for small and medium businesses. What distinguishes it from the rest of the accounting systems on the Australian market – and indeed elsewhere in the world – is that it is the first accounting package to be sold as a complete kit, to be taken away and installed and used by the buyer.

In Australia, Attache is sold in a cardboard attache case which contains the program diskettes, user manual, enough pre-printed stationery and blank paper to get started, a blank diskette and an example company with a set of accounts on diskette for training purposes. Thus the user can take the software away and immediately get down to work.

Attache runs on a number of different machines, including the IBM PC, Wang PC, Hewlett-Packard 150, DEC Rainbow, NEC APC, Toshiba T300 and the Panasonic JB3000. All these companies either distribute or recommend Attache, and in fact the package is the first software product to be distributed by IBM that does not bear the IBM label.

Five modules are available: debtors, creditors, inventory control, invoicing/sales analysis and general ledger. These are available separately or as two integrated packages: debtors/invoicing/inventory and creditors/general ledger.

The debtors system has a number of interesting features, including the ability to mix both open item and balance forward accounts in the same ledger, variable accounting periods, a full transactions audit trail and the ability to process forward-dated transactions. The other modules are similarly feature-loaded, with a multiplicity of reports.

Common Features

All the modules share common features, such as continual display of disk usage, password protection of files, the ability to defer printouts, a complete audit trail, and standard defaults on prompts.

But the technical specifications of Attache are not what makes it stand out from the crowd. Rather it is the intangible issues of support and training, problems which are so often an afterthought in the rush to get a software product out the door and earning revenue.

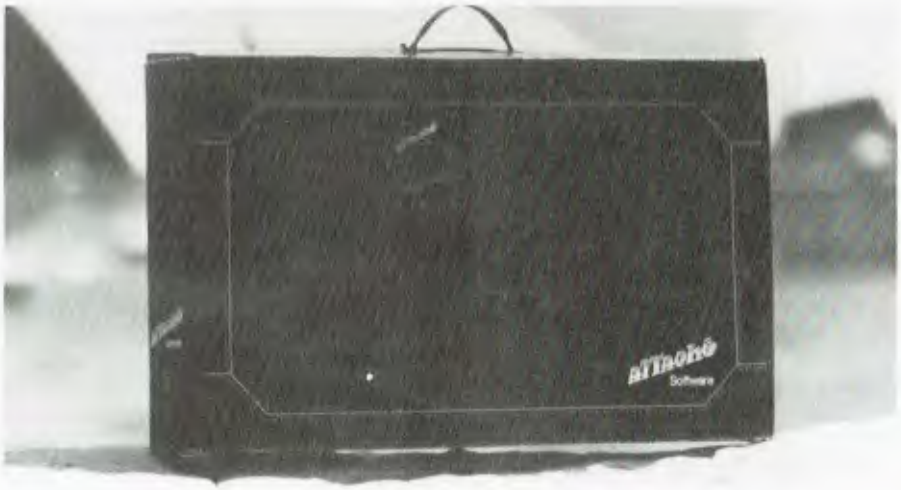
Attache Software has tackled the issue of operator training by collaborating with Metropolitan Computer College on the development of training courses, which are available at MCC and other commercial colleges around the country. This ensures that a business person can have his/her computer operator trained without the usual stumbling and fumbling which follows installation of new software.

This is, of course, in addition to the assistance provided by the manuals themselves, in the form of comprehensive instructions and guidance, and the dealer who sold the product and initially configured it. The dealers also have access to a technical hotline service.

In addition, a number of TAFE colleges have selected Attache software for use in their accounting courses, and it is also being used by the Auditor-General's Department in training auditors.

All the above has added up to a notable sales success for Attache in Australia, and this alone is worthy of commendation. But Attache has gone further, with the establishment of a US sales office, and is now achieving some success in the US market.

This is precisely the kind of action we want to see from Australian software houses. While some companies are content to supply the Australian market by importing software, the future of our industry lies with exporting Australian software to the US and international markets. It is for this reason, above all else, that Attache reached the shortlist for a Special Commendation for Australian Software. ❑



The Attache package in its cardboard 'attache' case.

The World According To

Whether or not he deserves the title Father of the Microcomputer, Charles Peddle recently gained and held the attention of several sceptical journalists when he explained his theories on the rise of micros. Evan McHugh was among them.

A PRESS CONFERENCE with anyone else would have been boring. But, braced with a cup of black coffee and a Scotch Finger biscuit I settled down for an earbashing from the so-called 'Father of the Microcomputer', Charles Peddle.

Charles who? That's what I thought when I was told to cover the latest Sirius release press conference. Barson Computers had brought old Chuck out from the States to talk about the computers his company, Victor Technologies, manufactures and which Barson markets.

A media consultant with shades of a circus ringmaster filled the room with wild ejaculations about the incredible exploits of Mr Peddle until finally, Chuck himself stood up and in a relaxed style began his address. What followed was a summary of the development of the microcomputer industry, from someone who was there.

Born January 1977 – The PC

Peddle told us the birth of the personal computer industry occurred in January 1977. There was a distinction to be made between a personal computer and a microcomputer, because micros are an area for hobbyists alone. Micros in this sense had been around since 1975. It was not until 1977 that a personal computer, a computer with built-in software for the non-computer oriented, appeared.

Thus, the Altair computer came on the market as a microcomputer for the enthusiast in 1975, but it was not until the Commodore Pet appeared in January 1977 that personal computers took off. And take off they did. The market grew rapidly at a rate no-one had predicted.

Peddle believes part of the reason for this growth was related to the mainframe computer environment. In the 1950s, an experiment was conducted in which programmers were given unlimited computing resources: a virtually infinite machine. The screens held as many characters as a typical printed page. Disk capacity was abundant. All available tools were laid on. The programmers went berserk. Under these conditions they became superprogrammers, producing an astounding amount of work.

The results of this study caused a strong trend in the computer industry to build bigger and more powerful mainframes, with more disk capacity, bigger screens and more software tools.

In the 1960s, the computer industry underwent a major change. During riots, computers were made targets and were badly damaged. An age of paranoia began: computers were sealed behind special bullet proof windows, access was restricted to operators and system managers and the average dumb hacker was shunted off to some remote terminal, with little or no idea of the machine he was using.

The typical computer programmer had his access to resources restricted in a variety of ways, both physically and with software and hardware. Then came the microcomputer.

Micros Brought Freedom

People suddenly found they could deal with computers in a totally new way. The entire machine was at their fingertips to do with as they pleased, without affecting anyone else. For someone who wanted a hands-on computer the micro was the answer.

There were other reasons for the growth. Relatively small cost was an obvious one. A rising interest in using small computers for time sharing and distributed processing applications also contributed.

The growth was insidious: once someone has used a computer to do their work, they feel terribly deprived if their computer is taken away from them. A computer trial often resulted in the computer being installed permanently. If someone moved jobs, they took their enthusiasm for computers with them.

The machines at this time were limited in capability. Typically, they had 8-bit processors, 8K of RAM and BASIC in ROM. Data and programs were stored on cassette. These limitations on the speed of program loading, data exchange and RAM were a natural limitation on the growth of the industry. People were not interested in things that required a great deal of fiddling about.

All that changed when Steve Wosniak got his hands on a floppy disk drive and managed to get it working on his Apple computer, which he had designed with Steve Jobs. The increase in speed of loading and on-line storage size suddenly made the microcomputer viable in the business market.

In 1979, the first true business program appeared, running on the Apple II and making use of the new disk drive system. It was developed by two Harvard graduates who thought they might be able to write some useful software for micros. The only machine anyone would let them play with was an Apple. The package they eventually wrote was Visicalc. This package, in Chuck Peddle's view, made the Apple empire.

Friendliness Becomes An Advantage

People discovered that data processing on a micro had some distinct advantages over a mainframe. The two most important were machine friendliness and increased freedom. If you play Star Trek on a micro for an hour at lunchtime, that's fine. If you try it on a mainframe you could get a particularly nasty message from the system operator suggesting you stop playing and try to do something physically impossible with your terminal (expletives deleted). If you try to access the wrong area on a micro, it asks if you're sure you know what you are doing, goes ahead and does it. On a mainframe bells clang, people come running, the Red Sea parts and sometimes a couple of gigabytes of data go down the old plug hole.

The next development in microcomputers came in 1980 with the release of the 8088. This was a 16-bit processor that was cost effective and had enough memory for almost all business applications. It introduced a third dimension to the personal computer, making the micro a true business computer. The microcomputer represented a level above dumb and intelligent terminals in that it could do many of the operations of a mainframe if it could downline load or read from a diskette. The number of microcomputer sales to large corporations began to increase.

Today's Buyer Categories

Within the personal computer market there are now three kinds of purchaser. The first is the raw beginner, the average guy who doesn't know anything about computers, but who is keen to learn. The machine he tends to buy is around the cost of a Sinclair. It won't do a tremendous amount, but it will give him a basic grounding in computers and computing.

The next category of purchaser is the knowledgeable computer user. Some-

Charles Peddle

one who buys a computer, such as the Apple II, for a specific job or to do a bit of serious programming on his own time.

The last group buys computers for business applications. Machines are available with considerable capacity and a wide range of software to suit business needs. The business purchaser might get into computing to take advantage of a package like Lotus 1-2-3 (reviewed in the December 1983 edition of *Your Business Computer*).

A Theory Of Computer Infiltration

In this last buyer level, a trend in the way computing infiltrates a business is evident. Chuck Peddle identified three phases for the assembled journalists who were by now impressed by the insights he was providing. In the first phase a computer will be introduced to the office, well supported, for a few specific applications. After the purchasers ▶

Systems User and Management (incorporating PRINTOUT)

Managing editor: Norman Kemp. Office: 10 Glen Street, Milsons Point, NSW 2061. All mail to: PO Box 430, Milsons Point, NSW 2061. Phone: (02) 922 3255. After hours: (02) 920 5988. Telex: AA70508 NEWSY. A privately circulated weekly review of Australian computing.

5 MARCH, 1984 NUMBER 100

MICROCOMPUTING NEWSLETTER PASSES 100TH ISSUE

For today's facts and tomorrow's outlook on the Australian professional microcomputing scene, *SYSTEMS USER AND MANAGEMENT* is essential reading. It's brief, easily read, to the point and has earned its reputation as Australia's leading microcomputing weekly newsletter. That's why after more than three years of publication it has passed its 100th issue, and is growing stronger every month.

Here is the newsletter produced for microcomputer users in business offices, manufacturing and processing industries, education, industry, government and many other occupations and activities. Compiled and written by expert contributors both in Australia and overseas, and edited by Norman Kemp, *SYSTEMS USER AND MANAGEMENT* is an non-technical publication which can be read for its immediate and investigative reporting, or retained as a hardware and software guide and reference to the most important areas of commercial and industrial microcomputing today.

This year *SYSTEMS USER AND MANAGEMENT* launched four distinctive sections to help readers. Check these headings:

- LOOK AHEAD — an authoritative preview every week of important forthcoming events. *SYSTEMS USER AND MANAGEMENT* gave early descriptions of the Apple Macintosh, the HP 150 Touchscreen micro, Eagle IBM-compatible computers and Microsoft Windows before their official releases. An early spotlight that searches out newcomers, it is designed to assist business users and evaluation groups that need advanced information for economic decision making.
- MICRO FORUM — users, vendors, distributors, oems all contribute comments and share information about new developments and existing projects in the current scene. Latest products, hardware and software support and maintenance, joint ventures and case histories are among topical issues appearing in this section. Future editions will deal with trade practices, contracts, industrial relations, occupational health, recruitment and training and a host of other vital subjects.
- PERSPECTIVE — surveys the computing industry with insight into the current market, providing weekly background and guidelines on updates and standard lines to aid the decision processes.
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become acquainted with the computer they eventually come back for more. They are likely to be seeking a better machine; one with a 10 megabyte hard disk or a 2.4 megabyte double-sided floppy disk.

In this second sale the buyer is looking for a more sophisticated machine and can be expected to have a more sophisticated idea of his needs. As there are presently few standards for data interchange, the buyer is likely to buy from the company that sold him his first machine.

The final sale involves the buyer in the purchase of a Local Area Network and data sharing packages. At this point there can be one or more personal computers on every desk in the buyer's company. In this phase the role of the personal computer changes from simple data processing to complex communication support.

Where To Peddle From Here?

As head of a leading computer company, Peddle has some interesting views on the direction the personal computer industry is likely to take.

He believes the personal computer market will come to be dominated by 16-bit machines in the next couple of years. He bases his case on the number of

people writing the appropriate software, maintaining that 50,000 people in the United States are writing software for 16-bit machines.

The areas of development will be fanned by people's desire for more peripherals and more points of access to systems. There will be a social stigma attached to not having a terminal on your desk, similar to not having a phone.

The next market to develop will be the portable computer market or, more importantly, the powerful portable computer market. Many people take work home. If they use a computer to do much of their work, they will want to have a computer in their home that matches the power of the one they use in the office.

IBM's Place In The Sirius World

One last comment Peddle made was on the merits of the IBM-PC compared to his company's Sirius range. Peddle said some of the limitations of the IBM-PC are its less than rich instruction set and it's smaller disk capacity. The Sirius range has what Peddle called a downgrade, to make it IBM-PC compatible.

He also pointed out that buyers should be wary of computer vendors that claim their machines are IBM compatible and can run IBM software. Around two-thirds of IBM software has been written by third-party vendors. Many of these people ignored MS-DOS and accessed disks, screens and printers directly. This renders their software hardware dependent. So, if a machine is IBM operating system compatible, it may not be able to run all software without a considerable amount of tailoring. Let the buyer beware. ❑

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EXPANDABLE TO	96K	96K	N/A	42K	N/A	64K	N/A	N/A
BUILT-IN EXTENDED MICROSOFT® BASIC	YES	YES	YES	ADDITIONAL COST	NO	NO	YES	NO
BUILT-IN RAM	80K*	32K***	64K	48K	64K	32K	32K	16K
EXPANDABLE TO	256K**	256K**	64K	NO	N/A	32K	64K	48K
KEYBOARD FEATURES								
NUMBER OF KEYS	87	71	63	61	66	73	53	40
USER DEFINE FUNCTIONS	10	10	N/A	4	8	10	N/A	N/A
SPECIAL WORD PROCESSING	YES	YES	NO	NO	NO	NO	NO	NO
GENERATED GRAPHICS (FROM KEYBOARD)	YES	YES	NO	YES	YES	YES	YES	YES
UPPER/LOWER CASE	YES	YES	YES	YES	YES	YES	YES	YES
GAME/AUDIO FEATURES								
SEPARATE CARTRIDGE SLOTS	YES	YES	NO	YES	NO	NO	YES	NO
BUILT-IN JOYSTICK	NO	YES	NO	NO	NO	NO	NO	NO
COLORS	16	16	15	128	16	16	9	8
RESOLUTION (PIXELS)	256x192	256x192	280 x 160	320 x 192	320 x 200	256 x 640	256 x 192	256 x192
SPRITES	32	32	N/A	4	8	N/A	16	N/A
SOUND CHANNELS	3	3	1	4	3	1	3	1
OCTAVES PER CHANNEL	8	8	4	4	9	3	5	3
A.D.S.R. ENVELOPE	YES	YES	NO	NO	YES	YES	NO	NO
PERIPHERAL SPECIFICATIONS								
CASSETTE	2 CHANNEL	2 CHANNEL	1 CHANNEL	2 CHANNEL	1 CHANNEL	2 CHANNEL	2 CHANNEL	1
AUDIO I/O	YES	YES	NO	YES	NO	NO	YES	NO
BUILT-IN MIC	YES	YES	NO	NO	NO	NO	NO	NO
DISK DRIVE CAPACITY (LOW PROFILE)	256K YES	256K YES	143K NO	92K NO	170K NO	100K NO	100K NO	100K NO
CP/M® COMPATIBILITY (Standard 80 column programs)								
CP/M® 2.2	YES	YES	NO****	NO	NO*****	YES	NO	NO
CP/M 3.0	YES	YES	NO	NO	NO	NO	NO	NO

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** 240K user addressable plus 16K graphic support
*** 16K user addressable plus 16K graphic support
**** Apple II can accept modified 40 or 80 Column CP/M
***** Commodore 64 accepts 40 column CP/M

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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.

Canberra Micro-80 User Group, Milt Cottee, 33 Crawford Cres, Flynn, 2615, 062 58 8822, meetings third Monday each month 7.30 pm in the small theatrette, Reid TAFE, for System 80, TRS-80 etc.

Canberra Osborne Group, c/ oGeoff Cohen, P.O. Box 136, Kippax, 2615, 062 54 7608.

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

N.S.W.

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

Apple Users Disk Exchange Club, Peter Lapic, 45 Malabar Street, Canley Vale 2166.

Apple Users Group, Colin Rutherford, P.O. Box 505, Bankstown, 2200, meets 6.30 pm second Monday of each month (Tue after pub. hol.) at Sydney Grammar School, Stanley Street, Sydney, 02 520 0926.

Atari Computer Enthusiasts, Tony Reeve, PO Box 4514, Sydney 2001.
Ives, 2075, 2 0933 ext 354, or 789 1379.

Ausborne, Brian Carney, 477 4492, P.O. Box C530 Clarence Street, Sydney, 2001, meetings third Wednesday each month at 6.30 in the North Shore Council Chambers, for Osborne users.

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 Lindsay or T. Macindoe, C/- P.O. Faulconbridge, 2776.

Broken Hill Microbee Users Group, Peter Cotter, 533 Radium Street, Broken Hill, 080 881621.

Central Coast Computer Club, Max Maughen, P.O. Box 36, Ettalong Beach, 2257, 043 24 2711, 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.

DEC Personal Computer Special Interest Group, Marion Rhydderch, DEC Australia, Northern Tower, Chatswood Plaza, Railway Street, Chatswood 2067, 02 412 5252.

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.

HP Desktop Computer Users Group, Dr. R. W. Harris, CSIRO Division of Mineral Physics, PMB 7, Sutherland 2232, 02 543 3460

Hunter U. G.- All Microcomputers, Secretary, P.O. Box 39, BROADMEADOW NSW, 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 N.S.W., Harry Richards, 4/2 Bortfield Drive, Chiswick, 2046, 02 713 1585, meets 2nd Tuesday each month at 8.00 pm in the Burwood R.S.L.

Macarthur Computer Association, J Napier, 23 Athel Tree Crescent, Bradbury 2560, meets first Monday each month at Airds High School, Briar Road Campbelltown at 7.30 each month, all machines are catered for, 046 25 2055.

Macquarie Microbee Users Group, Brian Thompson, meetings first Monday each month at Denistone East Primary School at 7.30 pm, 02 85 1659 after hours.

MEGS (Microcomputer Enthus. Group), John Whitlock, P.O. Box 1309, Chatswood 2067. Meetings third Monday each month at rear of St. Andrew's Presbyterian Church, 37 Anderson Street, Chatswood, (02) 638 1142.

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

Microbee Users Club (Broken Hill), Peter Cotter, 533 Radium Street, Broken Hill 2880, 080 88 1621.

Newcastle Microbee Users Group, Lee Osman, 12 Cleverton Close, Warners Bay 2282, 049 48 8813.

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

N.S.W. Primary School Microbee Users Group, Mr Peter Stretton, c/- Hunters Hill Primary School Alexandra Street, Hunters Hill 2110.

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.

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.

OSI Users Group, Nigel Bisset, 02 411 7142.

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 E162, St James, 2001, meetings 3rd Friday each month at Greenwich Memorial Hall, Greenwich Road, Greenwich.

Southern Districts Commodore Users Group, Lex Toms, 602 8691, 3 Lucille Crescent, Casula 2170, Meetings 1st and 3rd Wednesday each month, API Hall Currajong Road, Prestons.

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

Sydcom 64 (C64 User Group), Andrew Farrell, meetings first Tuesday of each month at 6.30 pm above Computerwave, George Street, Sydney, 99 2640.▶

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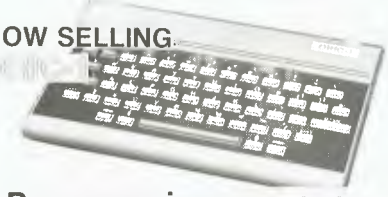

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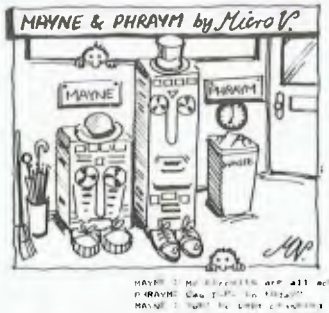

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Sydney MicroBee Users Club, Colin Tringham, 92 6408, PO C233, Clarence St, Sydney 2000, Meetings 3rd Sat each month 1-5 pm McMahons Point Hall, Blues Point Rd North Sydney.

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

Sydney TRS-80 Users Group, meetings 2nd, 3rd and 4th Saturday of each month at Botany, phone (02) 666 4716 bus hours.

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

Wizzard User Group, John Mifsod, 150 Bouganville Road, Blackett, 2770, 02 628 0801.

ZX-Spectrum Users Club, Craig Kennedy, P.O. Box 466, Epping, 2121.

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.

DEC Personal Computer Special Interest Group, see NSW entry

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.

Kaypro Users Group of Victoria, George Kunz, PO Box 159, Forest Hill 3131, 03 857 5462, meetings fourth Sunday each month at Burwood State College Community Resources Centre at 2 pm.

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 Enthusiast, PO Box 133, Mulgrave North 3170, meetings held on first Sunday of each month at 11.40am at Monash University Rotunda.

Melbourne Peach Users Group (MPUG), P.O. Box 191, Rosanna, 3084, 03 434 2541.

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

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

National Mutual Micro Users Group, R Prewett, NMLA, PO Box 2830AA, GPO Melbourne 3001, for National Mutual staff.

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.

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.

Sorcerer Computer Users (Australia), Secretary, G.P.O. 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.

Victorian Wizzard Users Group, Barry Klein, 24 Russell Street, Bulleen 3105.

Yarrawonga Computer User Group, Chris Younger, 057 44 3859, 10 Witt Street, Yarrawonga, 3730, for all machines.

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.

Basic User Group, Chris Lucey, Cranium Computers, 34 Lawless Street, Blackwater 4717.

Brisbane Super 80 Users Group, Gary Gatfield, 08 355 3173.

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

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.

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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.

Osborne Users Group of Qld Uni, Glen McBride, 07 371 4243.

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

Tandy, Apple, Commodore UG, Chris Lucey, 34 Lawless Street, Blackwater 4717.

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.

AACC, Adelaide Atari Computer Club, meets at Gilles Street Primary School, City, on first Monday (second if first is on Public Holiday) of each month. Secretary, PO Box 333, Norwood, SA 5067.

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

Adelaide Osborne Group, Russell Barter, The Secretary, 410 Regency Road, PROSPECT, 5082.

Alice Springs Microbee Users Group, Douglas Craigie, c/- PO Box 3230, Alice Springs 5750.

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.

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

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.

DEC Personal Computer Special Interest Group, see NSW entry.

IBM-PC S.A. Users' Group, PO Box 68, Walkerville 5081.

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

Microbee Users Group of S.A. MUGSA, The Secretary, GPO Box 767, Adelaide 5001. 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., Don Ide, 14 Scott Road, Newton 5074.

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

South East Computer Enthusiasts' Group, Glenn Mibus, 3 Millard St, Mount Gambier 5290, 087 25 1046, meetings 2nd and 4th Tuesday of each month from 6.30 at Mt Gambier High School Computer Room, for all machines and interested parties.

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

W.A.

Agriculture Users Group, c/- Mr R Fenwick, Dept. of Agriculture, Albany 6330. For farmers and the agriculture service industries.

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

DEC Personal Computer Special Interest Group, see NSW entry.

KAOS-W.A.,Gerry Ligtermoet, 09 450 5081, 39 Cloister Ave, MANNING, 6152, for Ohio Scientific Users.

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

Kaypro User Group of WA, Ainslie Sharpe, PO Box 91, Claremont 6010, 09 384 5511, meetings 2nd and 4th Mondays of each month in the Canteen of the Department of Agriculture, Jarrah Road, South Perth.

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. Wizzard Users Group, John REid, 13 Wenlock Road, Wattleup 6166, 09 410 2359.

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

DEC Personal Computer Special Interest Group, see NSW entry.

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 members to a newsletter and to discounts on computer equipment.

Tasbeeb, John Hannon, PO Box 25, North Hobart 7000, meetings first Monday each month at Elizabethan Matriculation College in D Block at 8pm, 002 34 2704.

Tasmanian T.I. User Group, Co-ordinator, 1 Benboyd Court, ROKEBY, 7019, 002 29 4009, meetings third Sunday of each month at University of Tasmania, room 373.

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.

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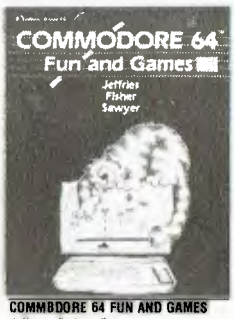

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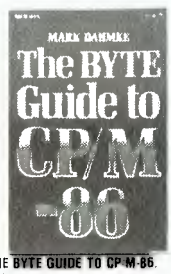

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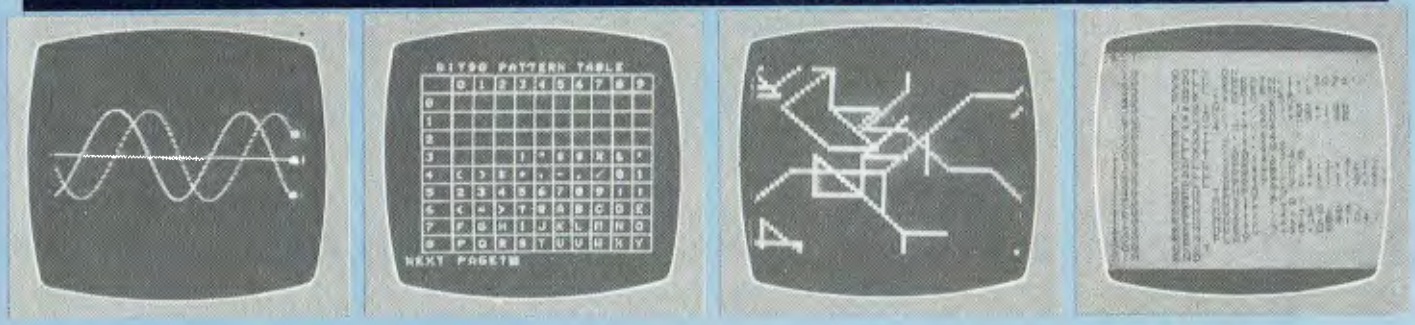

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OWNER REPORT

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HP TOUCH, as the system is known, is used and behaves as a touch screen system. It is in fact not strictly a *touch* screen, since touching the screen is not necessary to activate it. HP Touch consists of a grid of infra-red light beams just in front of the screen. The 14 horizontal by 21 vertical beams define a 23 by 40 grid on the text screen and a set of eight programmable function keys along the bottom of the screen. In practice you point to and normally touch the screen and in the process break at least one vertical and one horizontal beam. This returns a code to the system indicating what part of the screen is being pointed to.

How this information is used is a function of the software, but the potential is immediately obvious. Areas of the screen can be defined in menu form, giving information about the choices available to the user in the form of pictures and/or text. The user only needs to point to the appropriate area of the screen to make a selection.

Before we see how this is used to good advantage in the software, let us have a look at the hardware at our disposal.

HP 150 Hardware

The system unit contains an 8088 CPU, 256 Kbytes of RAM plus a special 6 Kbytes of video RAM, 160K of ROM, two serial ports (RS232 to 19,200 baud) and a parallel port (HPIB), a battery backed clock, and finally a 22 cm (9 inch) green screen with 720 by 378 alphanumeric resolution or 512 x 390 bit-mapped graphics resolution.

There is room for two expansion boards, which you may want to use to expand the system to the full 640 Kbytes of RAM it can handle.

The system tested used twin 258K single-sided Sony microfloppy disks (9 cm or 3.5 inches). You can add extra disk drives (up to a total of 12, named A to L), but these do not require the expansion slots as they string along the HPIB bus in a daisychain form. The HPIB bus is also used to add printers and plotters, and in fact a wide range of instruments of all kinds such as voltmeters, counters and frequency meters, signal analysers and so on. However, when used as a personal computer the HPIB bus use will no doubt be limited to printers, plotters and possibly additional disks.

The 9 cm microfloppy disks have a sliding steel cover over the reading slot to protect the magnetic medium. When the disk is inserted this automatically slides aside to allow the head to contact the disk. When the disk is withdrawn it covers the slot again. There is also a sliding write-protect tab to avoid accidental damage to valuable disks. The current microfloppies are single-sided but double-sided ones holding 640K each are expected to be available later this year.

When assembled, the system described above looks like a single unit but in fact it consists of a number of separate items. It starts with a small base (33 by 30 cm footprint), which sits on your desk. It contains a swivel mechanism so that everything on top of it can be swivelled right or left. On this sits the disk drive unit and then the main system unit containing the circuit boards and the screen. It is mounted so as to allow it to swivel up and down, so that the whole system can be easily oriented to view and touch it conveniently.

The 22 cm screen size may sound small, but with the resolution available it provides a clear and easy-to-read display with excellent definition. There are 27 lines by 80 characters of text available. Each character consists of a 7 by 10 dot matrix in a 9 by 14 dot cell with ability to shift characters half a dot.

The bottom three lines are reserved for system use. One line is used for system status display (time, CAPS, number or graph pad and Ins Char indicators) and two lines for the standard softkeys (f1 to f8) familiar to the users of HP computers and terminals. The difference is that now you can touch the screen in the appropriate area to select the softkey instead of pressing a key on the keyboard. In addition you can effectively fill any part of the screen with additional softkeys.

After allowing for the three dedicated lines we then have the normal 80 by 24 lines for the standard alphanumeric screen. The screen displayed is actually a 24-line window in a 72-line page held in memory. The window can be moved to any part of this page using the 'Previous' and 'Next' keys, a great facility when that information you wanted just scrolled off the top of the screen.

There is also a graphics screen. Either screen can be displayed separately or both can be displayed at the same time.

An optional thermal printer fits in the top of the display unit and either screen can be dumped to this printer (but not both screens at the same time). The thermal printer uses two types of paper, giving either a dark blue or a black image. The black image makes a better photocopy.

The keyboard is attached to the main unit by a coiled flexible cable so it can be moved about conveniently. It has a generous 107 colour-coded, sculptured keys including cursor controls, editing keys, a numeric keypad that doubles as a graphics control pad, plus the eight programmable function keys found on many HP machines.

Well, how do we now use all this power?

Software

The operating system of the HP 150 is MS-DOS Version 2.01, and all the normal facilities of MS-DOS are available from the keyboard. All of them are also available in menu form on the screen and may be selected by pointing.

In addition there are many enhancements. For example, files are selected

Your HP150 Computer

by pointing, so that copying a series of files from one disk to another consists of selecting the 'Copy/Backup' Application (HP calls any major program or group of programs an application), followed by pointing to the 'Start Appiic' softkey. After answering the first prompt ('Files From:') all files on the selected disk are listed in alphabetical order in a pattern of blocks on the screen (and the next two screens if necessary). The next prompt is 'Files To:', and as soon as this is answered the next set of softkeys appears, which include the 'Copy Files' option. Point to this and then to the files to be copied. Each file selected is highlighted, and if the wrong one is accidentally selected, it can be 'Unselected' again. When all the correct files are lit up the 'Start Copy' key is pointed to and ▶

Below: the HP150 supports a full range of peripherals, including the new HP7475 plotter. Right: the touch screen in action.

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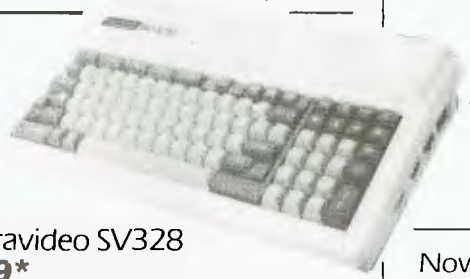

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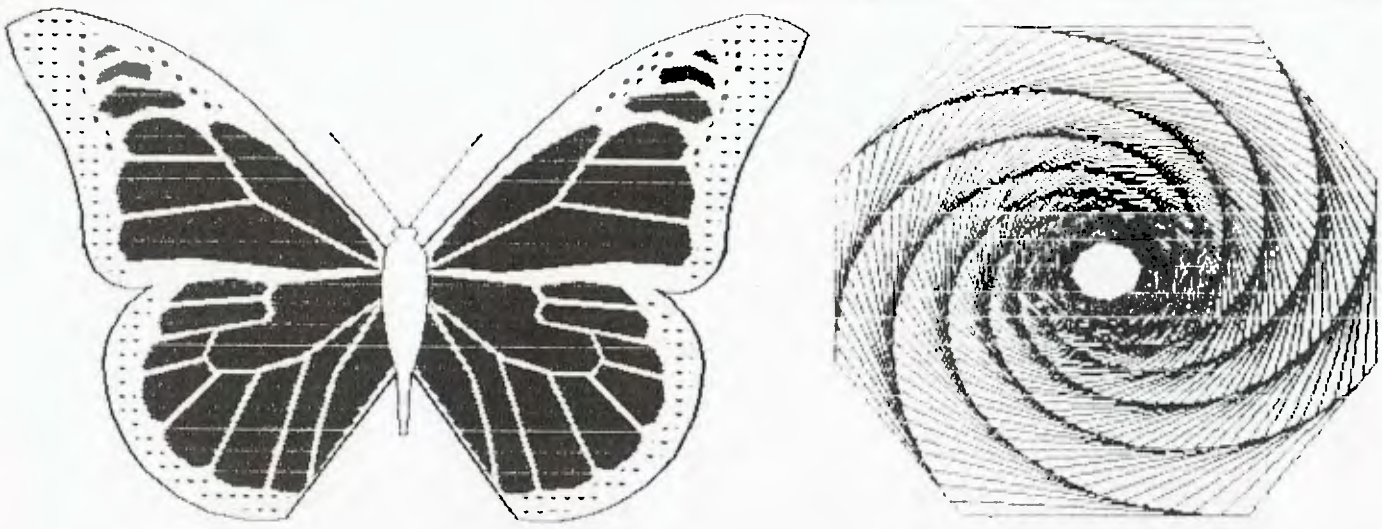


Two examples of a graphics screen dump to the thermal printer of the HP150.

off it goes. All this takes a lot longer to explain than it takes to do in practice.

The software which makes these enhancements possible is HP's Personal Applications Manager or PAM, and all software packages offered by HP run under PAM. It therefore provides the friendly interface between you, the user, and the operating system.

The HP 150 also has a powerful terminal option, in that it will emulate a range of HP graphics terminals. The terminal option may be selected from boot-up in terminal mode. All terminal parameters (baud rate, number of bits, parity, EnqAck protocol and so on) may be selected from a menu and may be different for the two serial ports. To return from terminal to local mode at any time you press the SHIFT + STOP keys on the keyboard.

All software packages under PAM provide a similar appearance to the user. They include such industry standards as VisiCalc and Wordstar, but also some new ones such as Memomaker (a simpler word processor) and Personal Card File (a simple database). Other packages to be available soon include Condor, dBase II, Multiplan and Lotus 1-2-3. As a regular user of Lotus 1-2-3 on the IBM-XT I look forward to seeing what HP have done to improve an already excellent program.

The standard manuals include the Owner's Guide and the Terminal User's Guide, and each software package has its own manual. The style is that of the three-ring binder in a box, so they can be easily lined up on a shelf or desk. The quality is what one would expect with this type of machine. They are clearly written, well indexed and have index tabs at the start of each new section so that any section can be quickly located. In three days of reading and using the manuals I only found three very minor errors. One surprise (not an error) was the spelling of 'disc' in place of 'disk', which is the last thing I would have expected in a manual produced in the USA.

Now, let's look at one of the software packages in more detail.

VisiCalc

VisiCalc comes on a microfloppy disk but without an operating system. You must boot up on another disk and then insert the VisiCalc disk. One of the soft-key options on booting is 'Reread Disks'. You can therefore change disks ▶

MemoMaker/Wordstar

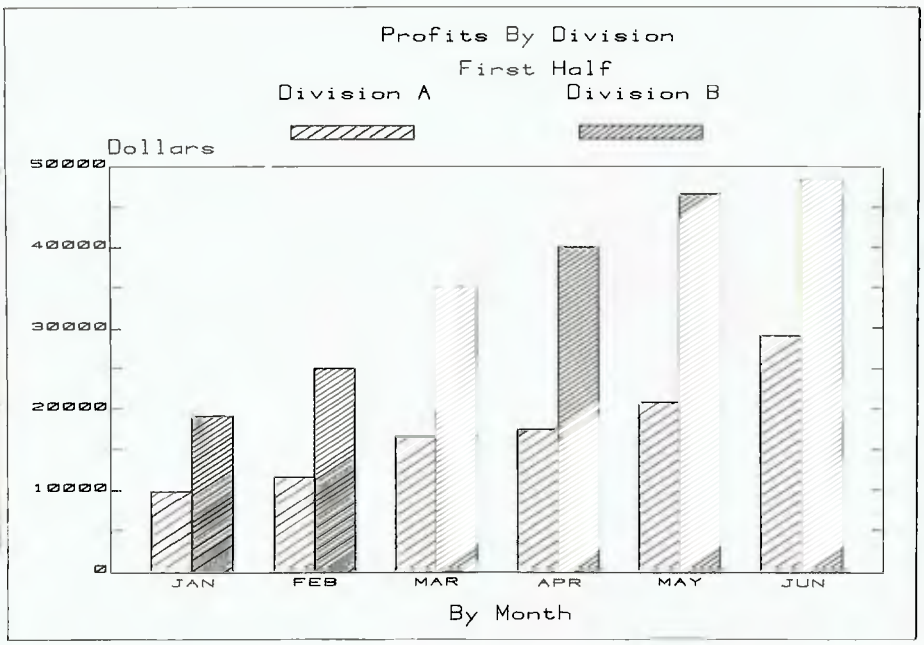
MemoMaker and WordStar are two wordprocessing Applications for the HP 150. Wordstar is the standard professional wordprocessing package except that running under PAM it is a good deal easier to use. Most commands can now be given using soft keys as well as by using the normal CTRL sequences.

MemoMaker is a simpler system with fewer facilities but with the advantage that the file structure is the same as for Wordstar.

This means that a rough draft done under MemoMaker can be picked up by WordStar for final production and that a document prepared under WordStar can be edited using MemoMaker.

MemoMaker has the usual formatting facilities including margins, tabs and centering. These are available while you are typing original text and in a block mode later but not while you are editing. It has cut and paste block move capabilities but no find and replace. It can display and print various enhanced character sets such as **boldface** and underlined.

A text screen dump of the HP150 showing some of the formatting capabilities of MemoMaker.



Right: this figure was plotted on the HP150 and printed out using the HP7470 plotter.

and point to this option to find what application is on the new disk. All applications on the system are then listed on the screen, and the appropriate one is selected by pointing to it. This highlights it and the 'Start Applic' softkey loads and runs it.

If you do not want to point to the screen for some reason, all selections can always also be made by moving the cursor (a small arrow at this stage) to the required block and pressing the SELECT key on the keyboard. This highlights the selected block. To load and run the application, you then press the 'Start Applic' function key on the keyboard.

The version of Visicalc used has all the features I have seen in VisiCalc, but I am not a regular user so it may have a few extra ones. Pressing '/' brings the familiar 'ABCDEFGIMPRSTVW-' string up, from which the required function may be selected. But in addition there is a main menu of eight softkeys, and most of these have a further eight choices. In some cases this continues to the fourth level. And while I am never sure whether I need F for File or F for Format in the string prompt, there is no mistaking which softkey to select for file operations, since the prompts on the softkeys are 'Load/Save' and 'Format'.

Softkey f8 is always the 'Exit' or 'Done' key, which returns you to the previous level or to the main menu. In the main menu this key exits from VisiCalc, although you must confirm this from the keyboard to avoid unintentional exits. Since the touch screen has a buffer, a shaky finger may select the same key twice.

The manual contains a map of the VisiCalc letter command tree and also one for the softkey tree. These give a useful overview.

There are lots of help pages available, and the most appropriate help pages at any stage may be brought on the screen by selecting the Help softkey or by pressing '?' on the keyboard.

Cell selection can be done in the usual ways, but also by pointing, and with a little practice I was able to do this successfully most of the time. Selecting the right column is easy, even when the column width is set to its minimum value of 3. Selecting the correct row is a little more difficult, since rows are only one line high. Depending on the angle of your finger to the screen and the location of the display on the screen relative to the sensing beams, you may have to point slightly above the cell required. My natural tendency was to point slightly below it, which resulted in the selection of the cell below the one I wanted.

At this stage you may feel that you should use a smaller pointer, such as the end of a pencil. This is not so. With a pencil only about every second line can be selected. Since there are only 14 horizontal sensing beams and 27 lines on the screen, half the lines must fall between two beams. These can only be selected by interrupting the horizontal beams above and below the line at the same time. So, use your finger.

Other Software

Other software not available for review but which should be available by the time you read this includes Microsoft Compiled BASIC, FORTRAN, Pascal and COBOL, as well as HP's Series 100 BASIC, several graphics utilities and a set of accounting packages. Other software planned includes an additional word processor (Perfect Writer/Speller), a spreadsheet (Perfect Pack), statistical programs (Statpak) and several games.

Summary

The HP 150 is the easiest to use machine I have seen.

It represents a major advance in cost-effective technology in the personal computer field. It is well priced to compete with the IBM-PC and therefore with all other systems in the $5000-up bracket. It comes with an excellent range of high-quality, general-purpose software with manuals of matching excellence.

The system is so easy to use that most users will hardly ever refer to the manuals after the initial learning period. No manager any longer has the excuse that he cannot use a personal computer because he does not have time to learn how to use it. With the information-handling tools provided, the applications for the HP 150 are limited more by our ability to ask the right questions than by the convenience or the power of the system to implement the solutions. ❑

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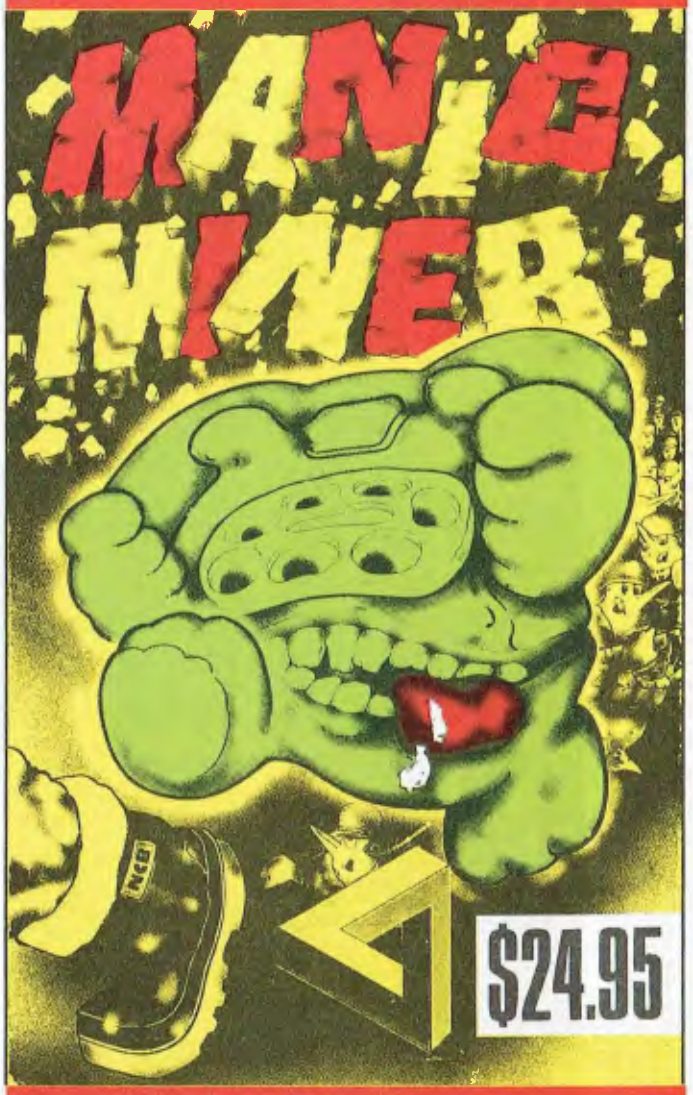

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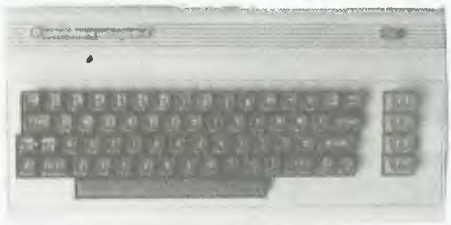

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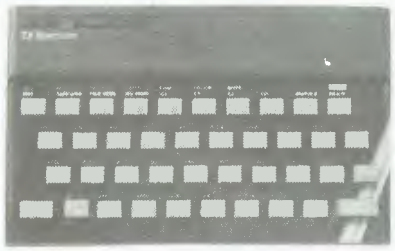

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MAGAZINE

What really happened to Osborne?

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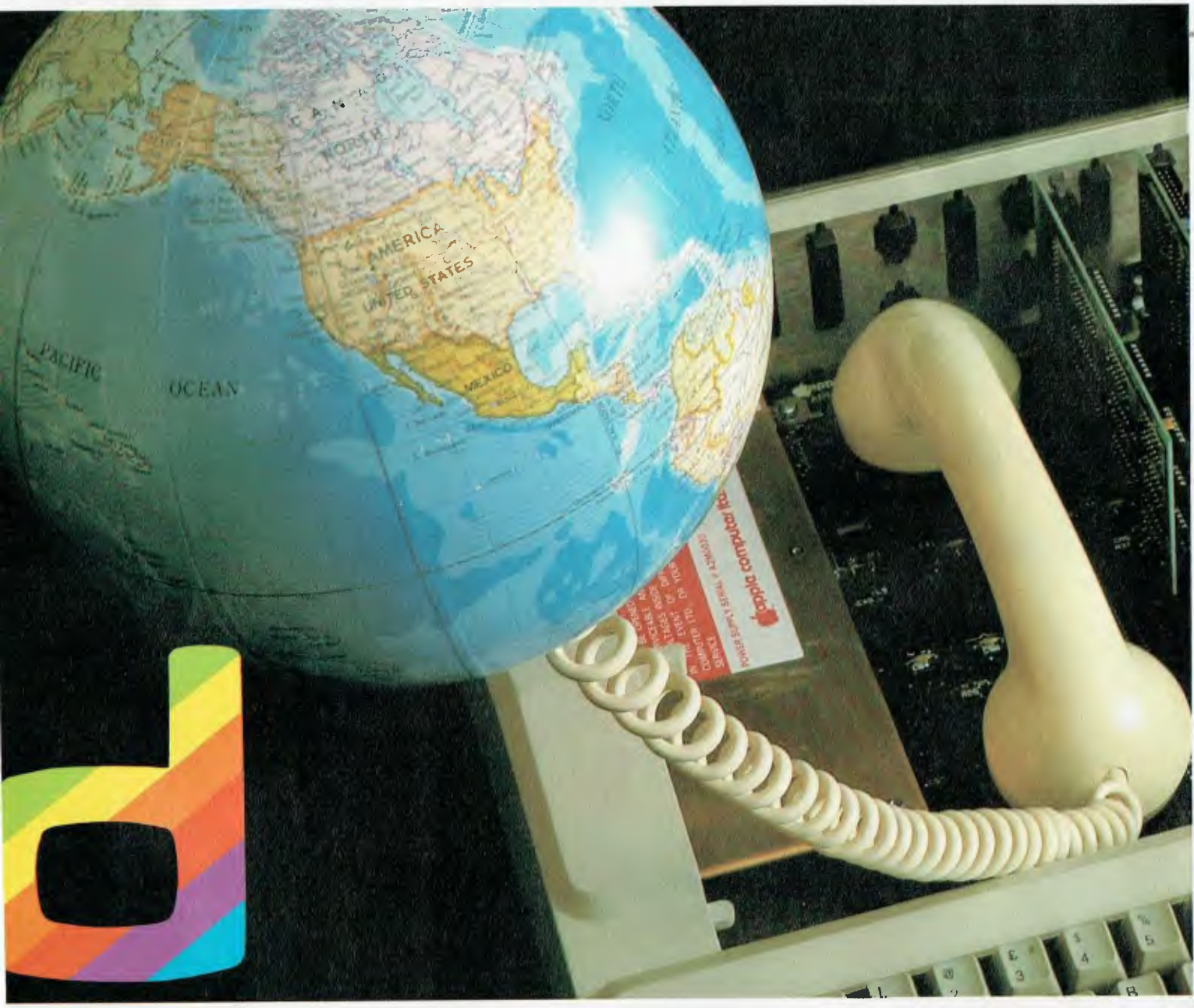

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The 'collapse' of Osborne Computer Corp sent shock waves through the micro-computer industry; was this the beginning of the 'great shake-out'? Find out what really happened.

BY BILL BOLTON

Talking Tallyphone 13

It is hoped that computers will figure significantly in providing career opportunities for the handicapped. The 'Tallyphone' is a system which not only offers to improve the operation of company switchboards, but also broadens the job market for blind people.

BY EVAN MCHUGH

VisiOn Reviewed 19

Les Bell used to have an office without windows; he didn't think they were that important. Then he moved to swish new offices — with windows — and wouldn't change back. Now he's even got a computer with windows . . .

BY LES BELL

Multitech MIC-504 Business System 22

Another 8-bit computer running CP/M? Yes, the Multitech MIC-504 does fit this crowded category, but has some interesting features to distinguish it from its competitors.

BY JOHN NICHOLLS

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The release of the IBM-PC somewhat overshadowed DEC's release of the Rainbow 100, but the DEC machine promises to be at least as good as Big Blue's baby in virtually every aspect.

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Your Business Computer is published bi-monthly as a pull-out section of *Your Computer* magazine by the Federal Publishing Company Pty Ltd, 140 Joynton Avenue, Waterloo 2017. (02) 663-9999. Telex: FEDPUB AA74488. Publisher: Michael Hannan. Printed by ESN — The Litho Centre, Sydney. Typeset by Hughes Phototype, Spit Junction NSW. (02) 960-2788. Distributed nationally by Gordon and Gotch.
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What *really* happened to Osborne

The 'collapse' of Osborne Computer Corp has sent shock waves through the microcomputer industry. How did it happen?

Prior to Comdex/Fall '83, I spent a week in the Bay Area around San Francisco conducting some protracted negotiations with Digital Research. As I had quite a lot of time to kill outside business hours, I started to dig around to see what I could turn up about the Osborne 'collapse' on its home territory. It didn't take long to track down some ex-Osborne employees. The following account is put together from what they told me. I spoke to production line workers, middle managers and executives (the human ones, not the computers).

Is this story the ultimate truth on Osborne Computer Corp problems? I don't know for sure. What I do know is that:

- It's first hand, from people who lived it.
- It fits other external facts well.
- It has internal consistency.

The Shake-Out?

For several years industry pundits have been predicting the 'Great Shake-Out' in the microcomputer industry. This great shake-out is supposed to see the collapse of many small computer companies and leave a few big computer companies controlling the market. Is the Osborne episode the start of the great shake-out? I think not; I don't even believe there will ever be one.

The insolvency of Osborne Computer Corp was an excellent example of classic capitalism at work. The company made some fatal mistakes in a fiercely competitive, savage marketplace and paid the traditional, quick penalty of financial destruction.

Adam Osborne, The Driving Force

If nothing else, Adam Osborne deserves to be described as a phenomenon in the computer industry. On the three occasions I have met him, he has exuded an air of supreme confidence in his own abilities. Others have called this blinding arrogance, though this is perhaps too brutal.

Adam Osborne moved to the US from Britain in 1961 and practised as an engineer before founding Osborne & Associates in 1970. His new company concerned itself with consulting and technical writing. This quickly turned into a major publishing exercise for computer and electronics book titles, which was worth US$5 million when Adam Osborne finally sold out to McGraw-Hill during 1982.

Adam Osborne used publishing and writing to build his influence in the computer industry. A regular column, 'From the Fountainhead', which appeared in *Interface Age* and other magazines, was Adam Osborne's vehicle for chastising computer companies that didn't perform well. Not all his predictions came true, of course. In his book on the future of the micro industry, *Running Wild*, he wrote: "In its most famous business, run-of-the-mill business computer systems, IBM will soon cease to be a significant force."

After prodding the industry to build new types of computers, Adam Osborne decided to get into the computer manufacturing business himself. He said, "I told people what they should build and nobody did, so I built it!"

The Osborne 1

As far as anyone can tell, the Osborne 1 computer in a recognisable form was first discussed by Adam Osborne during September 1980. Adam Osborne has always been an idea generator and many of his ideas come to nothing, so the executives at Osborne & Associates weren't sure what would happen to the computer idea.

"His personal energy is like a whirlwind, you either get out of the way or get picked up in it," said Georgette Psaris, Vice President of the company.

From Adam Osborne's original concept, hardware genius Lee Felsenstein turned the Osborne 1 computer into a manufacturable item. There were two key concepts in Adam Osborne's plan to make his mark on the computer industry in the form of the Osborne 1.

The first concept was portability; the machine would draw attention to itself as the first of a new type of microcomputer that would go to the computing task rather than have the task brought to it. He packaged the Osborne 1 so that it would fit under a standard commercial airline seat and so could be treated as hand luggage. This idea wasn't new; Hewlett Packard and Tektronix had exploited it in their expensive electronic test equipment for years, but Adam Osborne was the first to see the mass market potential of such packaging.

The second concept was to 'bundle' software with the computer. For US$1995 you not only got a fully functional microcomputer but also nearly US$1500 worth of popular, industry standard software to make it immediately productive. This put the Osborne 1 streets ahead of any existing machines in the value-for-money stakes. Adam Osborne was able to secure some extremely attractive deals for software as he was the first to propose bundling. He later said, "Quite frankly, I was amazed afterward when anyone said it was innovative or a mark of brilliance. It seemed utterly obvious."

Osborne Computer Corp Is Born

In early 1981, using funds from his publishing business and some US$1 million in seed money from venture capitalists like Jack Melcor, Osborne Computer Corp was launched. Its initial home was an existing plant in one of the many high technology industrial parks in Hayward, opposite San Francisco.

The accommodation was cramped and somewhat makeshift right from the start, but no-one really complained; it was all so exciting. Osborne Computer Corp's team was young, bright and determined to be successful. Lynn Hagen, in charge of retail sales, was just 24, while the vice-president of marketing, Georgette Psaris, was 25. With their unbounded enthusiasm, they would soon be joining the other self-made millionaires of the nearby Silicon Valley in reaping the rich harvest of the microcomputer industry.

The Osborne 1 hit the market in the US in July 1981 with tremendous impact. With an introductory price of $1795 (lower than anticipated) it was less expensive than any other comparable computer and portable as well. The industry's reaction was mixed. While most praised it as a breakthrough, some saw it as a sloppily designed, opportunistic gimmick.

I remember well my first contact with an Osborne 1. Trevor Marshal and I

Computer Corp.?

Ever since Osborne Computer Corporation opened for business the industry has been waiting for something to happen! Early predictions of what that something might be included instant fame and fortune for all involved. The reality has turned out to be somewhat different: the 'something' has been a lengthy period in provisional protection from creditors (or Chapter 11 as the jargon goes in the US legal system) with a possible re-emergence to an uncertain future.

By Bill Bolton

struggled to get some public domain CP/M programs across to it via the RS-232 link, unsuccessfully as it turned out. We were both impressed (with the machine) and dismayed (with the documentation) at the same time.

One of the truisms of marketing theory is that the customers are the final arbiter. Osborne Computer Corp's customers made the Osborne 1 an overnight success. "We are a force in the microcomputer revolution," said a jubilant Adam Osborne.

Those early days weren't without drama. One of the first production batches went to Computerland, and most were 'dead on arrival'. The problem was faulty memory, so a week of 24-hour shifts was needed to replace the faulty chips. Everyone from executives down was on the assembly lines to get the job done, even Adam Osborne. Computerland later said no other manufacturer had fixed a problem so quickly.

To those at Osborne Computer, Adam Osborne was a leader, not just a manager. His words had the weight of a guru, a quasi-religious figure. His flamboyant personality and personal charisma made him a darling of the press and never lacking in publicity for himself or his machine. He was more than this, though; as an accomplished engineer in his own right, he often contributed on technical matters.

Double Density

Despite minor ups and downs, typical in any growing business, Osborne Computer Corp was doing well one year after the Osborne 1 introduction. There were now competitors, notably Kaypro, but the international market for Osborne 1 was developing well.

In mid-1982 Osborne Computer Corp went after further venture capital and had investment firms falling over themselves to lend a slice of the US$10 million the company was after.

One of the problems with the Osborne 1 was its low disk capacity, less than 100K. Its competitors were starting to introduce double density drives with significantly higher capacities per disk, and Osborne Computer Corp needed to do something about its competitive position.

From September 1982, Osborne Com-▶

puter Corp was technically ready to ship double density systems, but what about existing stock? There were 11,500 single density units still on dealers' shelves or in the pipeline. If the company introduced a new double density model, those 11,500 units would become 'dead' stock, in other words, unsaleable. Some within Osborne Computer Corp wanted to push ahead with the new technology regardless of what it did to the dealers, but others urged caution.

The cautious advisers prevailed, so something else was needed to keep Osborne 1 sales alive. The plan was simple; every Osborne 1 would have an additional, major software item bundled with it. The extra 'free' package was Ashton-Tate's expensive and powerful dBase II database system. In just two days, Osborne Computer Corp executives negotiated a contract with Ashton-Tate and orchestrated a promotional campaign to get the giveaway program started.

The promotion was a runaway success, generating a massive market demand. The company's production facilities were already running at full capacity with nothing much to spare. The unanticipated demand drove the production department crazy. Working weeks of 50 to 60 hours had been the norm for many months and now it was starting to tell. Under pressure to produce more, some sections of the company tripled in size in very short periods. Production delays were upsetting dealers and the quality of the product was becoming variable.

The old Hayward plant just couldn't support a company doing over US$9 million a month in business. There were only eight sales people to handle this business, internal communications were poor, and few management records were kept.

In the backroom, work was beginning on new products to keep the momentum up. To launch these, Adam Osborne knew he needed more capital, so plans were made to take Osborne Computer Corp 'public'. This meant making a public stock offering through the stock markets. As a sidelight, going 'public' would make Adam Osborne and his senior executives (all large shareholders) very, very rich.

Preparations had to be made to bring Osborne Computer Corp under tighter control before a public offering would be acceptable in the share markets. In October 1982, Adam Osborne and his board of directors decided to find a new president suitable for the task.

The New Year

The start of 1983 saw Osborne Computer Corp in a new, much larger building at Hayward with a new president at the helm. Robert Jaunich II, formerly president of Consolidated Foods Corp in Chicago, was very different from Adam Osborne. He lacked Adam Osborne's flair and has been described as awkward, but he had a good sense for the 'bottom line' and keen insight.

Jaunich soon started to uncover problems within Osborne Computer Corp. The dBase II promotion ended in January, but it cost the company dearly. The later production runs of Osborne 1s were of poor quality and were creating a massive maintenance load for the already overworked engineering department. Some customers were having to wait up to six weeks to get delivery of dBase II as Osborne Computer Corp had underestimated demand and the dealers were getting a lot of abuse.

Big Blue

The market had changed since the Osborne 1 was introduced. IBM had moved in on the personal computer market with striking success. IBM created a new feature which the Osborne 1 didn't have – 'IBM PC compatibility'. Meanwhile Kaypro had managed to grab 40 per cent of the portable computer market by producing a machine very similar in concept to the Osborne 1 but correcting the Osborne's largest shortcoming, a tiny 125 mm video display.

The first of Osborne's new designs, the Executive, was shown to the computer press at the end of January, but they were embargoed from publishing anything on it until April 1. Some saw the Executive as overpriced and the screen as still too small, but most felt that Osborne Computer Corp had at least established credibility for the new model. There was also the promise of the 'Vixen', but it was still having engineering problems.

Consolidation

Jaunich was consolidating his power base within the company. This was centred on the board and venture capitalists who were bankrolling the company. He was at odds with the marketing executives, so moves were instigated to form a new team of executives more likely to project a stable corporate image.

Georgette Psaris was shuffled sideways to vice-president, strategic planning, and her place on the inner circle as VP marketing was taken over by Joe Roebuck from Apple Computer. From Memorex came Don Waite, Financial Controller, and Jim Otinger, General Vice President.

By the time Jaunich was done with executive reorganisation, only one of the old Adam Osborne team remained at the top level. Fred Brown was the driving force behind the Osborne Computer Corp sales effort and he bickered constantly with Jaunich. Brown complained that the company was suffering from 'analysis paralysis' while the market passed it by.

While this was going on, Adam Osborne was rarely about. He had a tight schedule of conferences, meetings and fund raising. Part of the deal with Jaunich was that he should not be interfered with over day-to-day management. It seems Adam Osborne was disturbed by Jaunich's style of running the company, but didn't communicate well with him. Many of the long-time Osborne Computer Corp executives felt Jaunich was running the company from behind closed doors and accused him of being almost invisible.

The Leaks

Jaunich was working at preparing the company for the public offering, and he was finding lots of things wrong. The public offering was due in May so Jaunich conducted an internal audit. To his dismay about US$10 million was unaccounted for. The missing money was in cash, services, inventory and other liabilities. There wasn't any suspicion of embezzlement, just incredibly poor accounting practices and controls. It seemed cash control was particularly poor. Don Waite figured that if the books were adjusted to take the missing monies into account, the quarter to February 1983 would show a loss of US$1.5 million instead of the previously anticipated profit of US$1 million.

The excess inventory was software for bundling with the new machines and was of poor quality and largely worthless.

A further internal audit showed the situation to be worse than at first feared, with Waite predicting an US$8 million loss for the fiscal year. After the event, it is plain that company accounting was so sloppy that no-one could really know what the true position was.

Despite all the problems Osborne Computer Corp had no problems in raising another US$9 million in venture capital, largely from firms who had participated in previous financing of the company.

At the end of April, Jaunich called Adam Osborne with the news that a public stock offering was just not possible. This must have been a bitter personal blow for Jaunich, who stood to make US$10 million out of stock when the company went public, part of the deal he negotiated when he joined. Other early leaders of the company also stood to lose small fortunes as they had taken their pay in stock options in the beginning.

Adam Osborne couldn't believe that ▶

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things were so bad and immediately returned to Hayward to find out what was going on.

Panic Reactions

The Executive computer was the only hope to stop the rot in the company. Things weren't going well with the Executive, however. April 1 came, but the Executive was still bogged down with the production department. Attempts were made to suppress the press releases on the Executive, but it was too late for long lead-time magazines like *Byte*, so the word got out.

In anticipation of the Executive, sales of the Osborne 1 plummeted to next to nothing. Meanwhile, the Vixen project was so beset with design problems that Jaunich decided to abandon it entirely.

Towards the end of April, Adam Osborne and the company's VPs went on a barnstorming tour to introduce the Executive to dealers. A week later they had 20,000 orders which they hoped they could fill. There were still 6000 Osborne 1s on hand at the company, so Fred Brown worked out a deal to clear this stock and get some cash into the company. Jaunich wasn't sure whether to go ahead with the deals Brown had made and finally called them off. Brown immediately resigned.

The Executive wasn't IBM-compatible but not to worry, Adam Osborne announced, there will be an IBM-compatible along in a couple of months. This effectively killed sales of the 8-bit Executive computer. Just one week after introducing the company's first truly new product in nearly two years, it was obsolete ...

The company had gone for another round of venture capital financing during June and had been able to raise US$11 million to keep things rolling.

The Rot

One afternoon in August, security guards moved in to keep watch while 203 employees at the Hayward plant were laid off. An almost equal number remained to hear Jaunich address them in the firm's cafeteria.

Jaunich told them that in three months the company would have outside investors or it would be sold. Cash flow was a whopping US$8 million (plus) behind, virtually no actual sales were made during April, Executive sales were behind predictions and so on. Joe Roebuck tried to rally their enthusiasm with a claim that IBM, Apple and Osborne would be the Big Three of the micro industry. Adam Osborne was present through all this but said nothing; he is said to have looked exhausted and defeated.

On September 13, Osborne Computer Corp sought protection from creditors under 'Chapter 11', provisional bankruptcy. The company owed 600 creditors US$45 million.

A Possible Rebirth

Ronald J. Brown, former head of Osborne Computer Corp, has taken over as president and chief executive officer. On December 13 1983 he filed a plan with the court which is hearing the Chapter 11 bankruptcy proceeding against the company. This plan was approved in the last few weeks and the company is now under new management and has announced plans to produce a follow-up machine to the Executive.

Brown's plan also has the approval of the company's three largest bankers and a committee representing the unsecured creditors. Robert Jaunich II has resigned as president but remains, with Adam Osborne, on the board of directors. International markets, Ron Brown's strength, are a key factor in the plan to rebuild the company, and it seems the US domestic sales efforts will be considerably scaled down.

Shipments of Osborne computers are starting to trickle into Australia again. Imports of Osborne computers into Australia are being handled by the recently formed Osborne Computer Sales (Australia), a Sydney-based company. Many Australian dealers who previously handled Osborne products are reported to be reluctant to carry them again, so Osborne Computer Sales will have its work cut out in re-establishing the Osborne products in the Australian market.

Some Quotations

Who was to blame? Adam Osborne blames Bob Jaunich and has said, "The major lesson I learned was that I'm as good a manager as any of those guys." There is an argument between Adam Osborne and Jaunich about whether the company should have gone public; I don't know who is right, but neither seems prepared to give any ground.

Adam Osborne is adamant that, "If you take a look at the record of right and wrong decisions, we did damned well – as good as anyone," and "We are squeaky clean, there is no way anyone can prove fraud."

John Dvorak, writing in *Infoworld*, claimed that Osborne Computer Corp would have been able to overcome its problems had it received the infusion of funds going public would have brought. I find this hard to believe. Bob Jaunich said, "We came into a situation where there were some shocking surprises. There were some bitter disappointments, and we tried our best to act professionally."

Implications

What are the implications of Osborne Computer Corp's problems for the rest of the industry? Already, some of the established (entrenched) computer companies are starting to run advertising stressing their long track record. Certainly the collapse can only strengthen the position of IBM, DEC, NEC, Wang, Sperry, Prime and their ilk in the micro market.

In the micro industry, when someone wins, somebody else usually loses. IBM has won a big market share and has scared off some venture capital from the micro market. Osborne Computer Corp is the first (and probably not the last) of the big losers. However, stable, well-funded companies like Kaypro and Compaq can probably survive. Even if they don't, others will rise to take their place.

Adam Osborne always claimed that slick marketing and advertising were more important than highly refined technology. I wonder if he still believes it.

If You Own An Osborne

Join one of the Osborne user groups now!

There are enough Osborne 1s around to ensure a continuing supply of software as long as there is a market for 8-bit software (?). Getting updates for Osborne-supplied software may be difficult, though. Self-help through user groups seems to be the best bet.

Fortunately the relatively simple technology of the Osborne 1 should make it physically maintainable provided the mechanical bits don't break. Certainly there are quite a few people in Australia who know how to fix Osborne 1s. The Hills computer service organisation would be as good a place as any to start if you want your Osborne serviced.

The Final Word

The final word goes to the man himself. Asked whether he was financially comfortable after the collapse, he replied, "It depends on who sues me," – and also on "who wins"! ❑

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It is hoped that computers will figure significantly in providing career opportunities for the handicapped. Evan McHugh investigated Tallyphone, a system which not only offers to improve the operation of company switchboards, but also broadens the job market for blind people.

Talking Tallyphone

There is more to Tasmania than wilderness and rain. A Tasmanian who can tell you about some of the state's other products is David Ransley, a switchboard operator who helped Transport Tasmania develop the Tallyphone system. Tallyphone is designed to keep track of a company's phone numbers and employees, so that phone calls and messages reach the people for whom they are intended.

It was not until he bought a BBC microcomputer that David Ransley learned to program. Using BASIC he started to design a telephone number system. It worked reasonably well, so he thought he'd try to use it at work. He took his system in and found that it was not only fun to use, but made his job much easier.

Telephone switchboard operators generally work from lists containing all the names and phone numbers of people working in the organisation. Almost every incoming call necessitates referral to the list. If details change, it can be a time consuming process to update the information. Although this is a laborious and cumbersome system, it is still used widely throughout the world.

With the aid of Transport Tasmania's data processing department Ransley was able to improve his system. After a while it became clear that if Transport Tasmania gave its approval, its DP section could produce a system to greatly improve the organisation's telephone data storage. The project went ahead.

David Ransley was still involved. As a switchboard operator, his knowledge of the nature of the work involved was invaluable to the team which was to produce a full-blown version of his original system.

"There is no better way to try out a system than to have someone who is going to be using it try it out," says David. "A programmer doesn't get the same feel as the operator, who relies on the system to work."

Speech Synthesis

Tallyphone has a high level of user-friendliness. This is another consequence of the influence of David Ransley. David is almost totally blind. The system has several features which make it suitable for use by handicapped people. The most significant of these is the speech synthesis unit. An instruction from the keyboard will make the computer read whatever is on the screen. It reads both numbers and names.

The synthesiser's 'speech' is not very clear, but after a short period of use it is said to become much easier to understand. In the short period that I was exposed to the system I became steadily more used to it.

Updating Entries

The way in which typographic errors are corrected and changes to the listings are made is also orientated towards the visually handicapped. Normally you would backspace over the error and type in the correction. But if you are blind or partially blind, you may not know where the cursor is positioned. Tallyphone allows you to hit the space bar and type the name, extension, or whatever again. Thereafter, the computer will use the second entry and disregard the first. Typing a question mark will also allow you to correct an entry by overwriting.

The version of Tallyphone that was demonstrated to *Your Computer* was running on a Prime computer using 128 Kbytes of RAM. The terminal was interfaced with a 300 megabyte hard disk. Transport Tasmania's system uses half a megabyte of space. Tallyphone may also be used on systems with multiple terminals.

Device Independence

Tallyphone was written in FORTRAN (while we're on the subject of extinct things, I recall hearing that a Tasmanian Tiger has been sighted). FORTRAN is supposed to be a scientific, ▶

number-crunching language. So what is it doing being used to manipulate a database? David Ransley's answer is that it allows device independence.

He says, "The package does all its own I/O and is not dependent on the operating system. This means that a user who would like the system on his machine will not have too much trouble tailoring it to suit."

The main use of the system is as a phone number and staff data file. The name, section, department, extension and other details of each person can be held on file. This information can then be accessed through any of a number of indexes. For example, you can access on name, section, or position in the company. New indexes can be set up at will. The labels for data items can also be changed.

"The system is parameter driven," says Ransley. "So it can easily be modified, even to suit other countries."

Rapid Search

Searches are very quick, given the disk-based system and indexing. The average time taken to find a piece of information is two seconds. On completing a search, the computer displays not only the name you were searching for, but also several of the names following it. Thus, a search on Smith will return a whole screenful of the rest of the Smiths and any other of the names following that will fit on the display. This feature is useful if the name sought is ambiguous. For example, a search for Johnson will also return Johnston, which may be the name you really wanted.

To have the information read out by the speech synthesiser, you just ask the machine to read the first name on the screen. It will be read out with a number. You can ask the machine to read any field that is displayed for a particular item.

More data exists than is usually displayed for a particular person. To see this data, you specify the item number of the person and the rest of the information will appear. It will include when the person has planned to go on leave and when they return, the position they occupy and other details that might be useful.

Billing For Personal Calls

It is also possible to docket calls. This allows the cost of an outgoing call to be recorded against the person making it. The data is entered in the form of the person's name, extension and the number to be called. After the call has been made the cost can be entered. The data may be entered in any order. The computer will work out which is which. A field that is missed out will generate a prompt.

The outside call request is stored on file until after the call has been made. The outward call file is volatile, which means the operator must do something with all calls before the end of the day.

Taking Messages

The same situation exists for the switchboard operator's incoming messages scratch pad. This pad can be used like a piece of paper to record messages left by incoming callers. If a person cannot be contacted, the operator makes a note and gets in touch with the person later.

The volatility of this file is again designed to ensure that the operator clears all messages before the end of the day. It is possible to dump this information from screen to printer, so that anything which cannot be dealt with by the end of the day can be stored and attended to later.

The system also has data screens, or info files. The operator can store commonly used but hard to remember information on any one of 34 screens. Each screen holds 34 lines. The Transport Tasmania info files contain information such as other branch numbers and the timetable of a ferry which runs to an island off the coast.

Training needed to use the system is minimal, mainly because of its user-friendliness. Pressing return at the entry level to the program will give a prompt and the system is also able to run in a menu-driven mode. The menus can be dispensed with if not required.

Protecting The System

The system can be protected, to make it impossible for anyone to gain access outside business hours. Also, the system can be programmed so that updates may only be made from one master terminal. This ensures that the supervisor takes care of all changes, that records don't get confused and that no hoax changes can be made (for example, sending all sales enquiries to the managing director's phone).

The system also has extra facilities to aid the blind. One of these is a set of coded beeps to let the operators know if they have not entered a piece of data, when a search is completed successfully and so on.

Autodial has not been used, but it can be incorporated using existing software packages. At present there is no interface between the computer and the telephone exchange.

The Tallyphone system represents considerable advantages to several different groups. For management it offers increased efficiency, and can also be used to produce internal telephone directories and reports on outward calls. For staff it eliminates tedious updating and searching through archaic filing systems. Most importantly, it offers disabled people, particularly the blind, employment opportunities in a new area.

The Victorian Institute for the Blind trains people to operate switchboards. Its experience is that it is normally impossible for a blind person to operate a switchboard in an organisation with more than around 1,000 phone numbers. Manual updating by braille is too time consuming for numbers any greater than this. Tallyphone's speech synthesis system makes it possible for a blind person to do the job no matter how many phones are in use or how many times the information has to be updated.

The market potential for the Tallyphone system is enormous. It would be of benefit to any company with a staff of 350 or more. The maximum capability is for 32,000 internal phones.

The Price

The software for the system costs $8,000 and the speech synthesiser an additional $500. The price includes installation, operator training and normal system back up. Already several Australian software houses and Telecom have shown interest in the Tallyphone system.

This Australian product seems quite likely to perform well and is apparently the only package of its kind in the world.

For more information on the Tallyphone, contact Denzil Yaxley, Transport Department Tasmania, 1 Collins Street, Hobart 7000. The phone number is (002) 38 9240. ❑

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As your needs grow, you may need to give more than one person access to your data files –sales and accounts, or say wordprocessing and stock control. Most personal computer being sold for data processing (wrongly we believe) get around this by 'networking' several personal computers to a common 'hard disk'. This arrangement is *unusably slow* in a most business situations. As the number of users grows, the situation gets *much worse*. Universe offer a much faster *Multiuser System*. Each user shares part of the central computer, with a massive increase in speed of access to information.

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At AED there is only one kind of computer we are interested in building for you – the best.
Our company's background has been in industrial control where computer breakdowns cost lives. We have brought these uncompromising attitudes to quality and reliability when we build every Universe.
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And if you ever have a problem you can pick up the phone and talk to the engineer who design your computer and very likely to the technician who commissioned it. No other computer company can offer you this standard of service at any price.
When you need them, we supply service contracts, phone support, training, custom programming and advice on updates. We will always take an active interest in our existing customers since you will eventually come back to us as your needs change and grow. You will be treated as if you are a new prospect, whether you have been a Universe owner for one or ten years.
We all take personal pride in providing a top quality product and in continually refining it in response to the needs of Australian business.

Subassembly testing

Our Aim – Total Reliability

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Les Bell used to have an office without windows; he didn't really think they were that important. Then he moved to swish new offices and wouldn't go back. Then he got a computer with windows. . .

Visi On

Over the years, personal computers have enhanced my productivity in various ways. However, of late, the major limitation I keep striking has been transporting data between various programs. Inserting a database file into a text file, for example, has always been either difficult or impossible (I've never been sufficiently motivated to find out which), and getting spreadsheet data into a database involves a bit of sleight of hand. The biggest problem was the inability to look at a database file while writing a letter, for example, or examine a database while working on a spreadsheet.

Apart from being the Year of the Mouse (according to Apple), this is also the Year of the Window. For the uninitiated, windows are separate areas on the screen which contain the output from two or more programs. Thus, it is possible to display a spreadsheet and a word processor document at the same time – although you can only work on one at a time.

This year will see the release of several 'windowing' products – DesQ, Microsoft Windows, DRI Windows, Apple's Macintosh, and the subject of this article, Visi On.

Visi On was released to an expectant press by Imagineering late in January. In this case, the press were the last to know: Myer and Grace Brothers had been selling the software for some time, and details of the product had been available since its unveiling at NCC over a year before. Ah well, at least we got to see it.

More Than A Window

Visi On is more than just a windowing package. It provides an operating environment (I used to like that word) in which software packages can exchange data. Thus you can 'cut and paste' in a somewhat similar method to that used by Lisa and the Xerox Star.

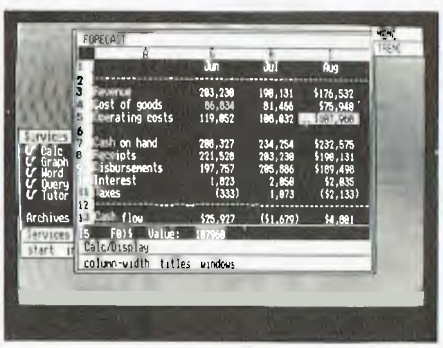
Visi On consists of a number of separate parts. At the heart of the system is the Applications Manager, which forms an interface between the applications program and the host operating system. This is a scheme that is becoming increasingly popular these days, as software houses try to support both MS-DOS and CP/M, not to mention UNIX.

The Applications Manager is written mostly in C and is specific to both the machine and the operating system (how else can you display graphics on the IBM-PC?). Also required for the system is a $375 mouse – the Visi On mouse is an optical type, as opposed to the more common mechanical type, and uses a ruled pad and two buttons for selection and scrolling.

Applications Packages

Three applications packages are available at first release: Visi On Calc ($630), Visi On Word ($595) and Visi On Graph ($395). Soon to be released is the Visi On Query relational database system.

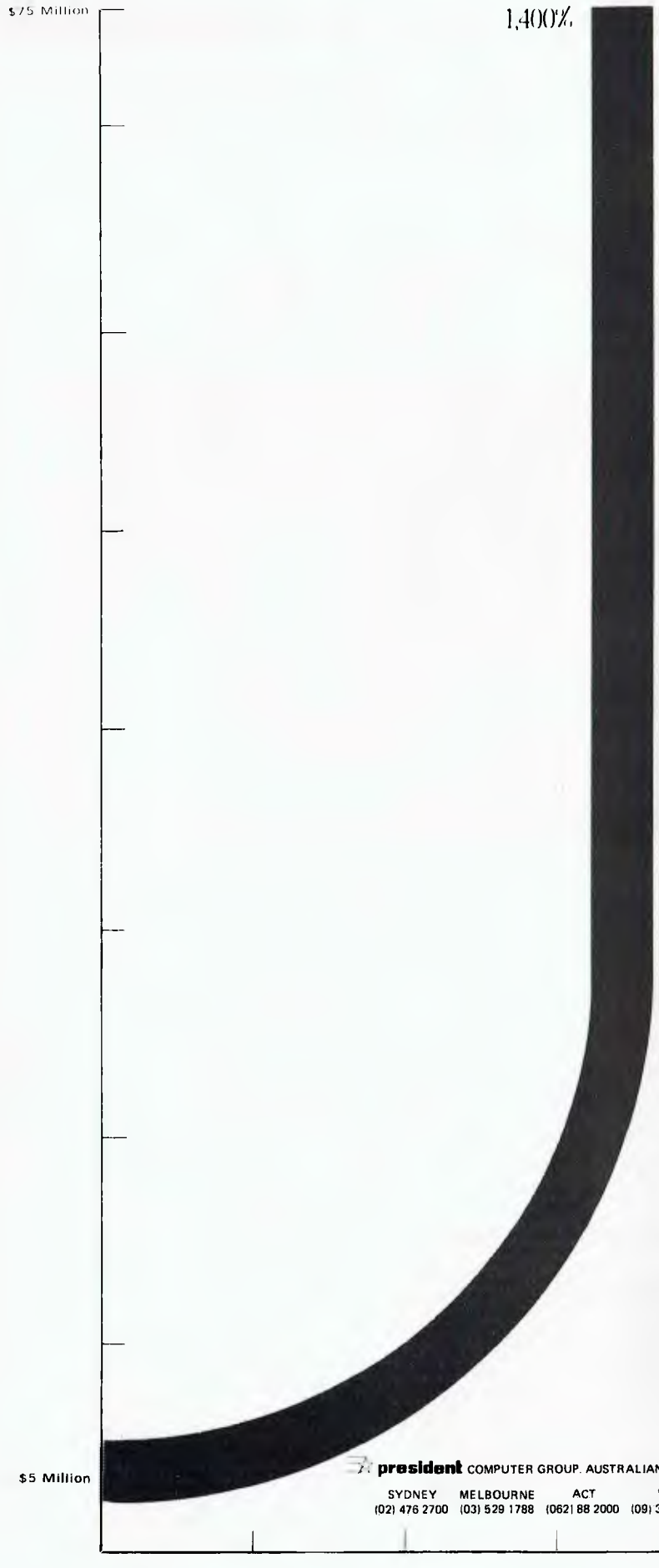
Visi On Word is a disk-based word processor with all the usual features, such as justification and underlining. It's mouse-driven, with the ability to mark groups of characters, sentences, paragraphs or whatever, and insert, move or delete them. An 'undo' feature allows the recovery of deleted text. The system is supplied with a utility to transfer files from the Visi Word program, and owners of that package will be able to credit its price against their purchase of Visi On Word.



A screen showing VisiOn Calc in use.

Visi On Calc supports multi-key sorting functions, consolidation, and the ability to open multiple windows simultaneously. Additional features include template creation, flexible print options, natural order recalculation, extended format options and virtual memory management – the program supports a genuine 511 rows x 128 columns.

The Visi On Graph package integrates with the Calc program (and others) to provide easily interpreted displays of data. Users may create line graphs, pie charts, area charts and bar graphs in minutes by entering data directly into the program or transferring it from Calc spreadsheets, Visi On Query or other Graph windows. The program uses automatic scaling to simplify operation, ▶



IF YOU THINK IBM IS THE ONLY GAME IN TOWN, WE'RE GOING TO THROW YOU A CURVE.

Whenever we hear claims that IBM is destined to be the sole survivor in a personal computer marketplace supposedly littered with dying independents, it reminds us of Mark Twain's comment about the reports of his demise being greatly exaggerated.

There is life after IBM.

While there is no denying IBM's stature in the industry, to think they're the only game in town simply doesn't compute. Just 'ook at your own sales curve.

In the past fiscal year, Kaypro sales grew 1,400%. In fact, we are now the fourth largest seller of personal business computers in America (after IBM, Apple and Tandy).

Thereis, it would seem, life after IBM.

Our success is hardly a fluke, given our 30 years of electronics manufacturing experience. Nor is the strength of our diverse product line unique. We can point to dozens of independent computer companies with equally strong barometers of success.

And therein lies the critical issue. For, though pleased with our own success and the continued vitality of the industry as a whole, we are concerned that all the predictions of an eventual IBM stranglehold on the market might create something of a self-fulfilling prophecy. As a business publication noted recently, many industry analysts believe that the media-fueled IBM mania has had a harmful effect upon the industry, discouraging investor and consumer confidence in companies whose successes warrent that confidence.

Capitalizing on this unjustified fear, IBM urges consumers to huddle under the security of its Big Blue umbrella. Only then does the customer discover that IBM is selling the very guts of a personal computer system as expensive add-on "extras" – things like software to make the computer uesful, two disk drives to store information, or a screen to view the work being done. By the time a full IBM system is assembled, the buyer has usually paid about twice what a comparably equipped all-in-one Kaypro would cost.

IBM is certainly free to market their machines as they please. But it does make us wonder what might happen to the downward trend in computer prices if IBM – "the only company able to overcharge," as one newspaper reporter not afraid to draw attention to this issue recently put it–were to gain the vise-grip on the market that some people fear.

Some industry analysts also fear that the IBM juggernaut threatens the innovative drive and technological momentum that made America's personal computer industry what it is today. After all, IBM did not invent the personal computer. It merely used its marketing power to push its way into a new industry that had already been created by smaller, more innovative firms. As a recent commentary in the industry's magazine of record, InfoWorld, put it: "The record shows that IBM consistently stood in the way of progress, while all innovation came from startups.'

"At Kaypro, we don't think any one company can monopolize the personal computer business, and our own sales figures prove the point. But we're also not blind to the attractive power of the IBM logo. That's why we'll always go them one or two steps better by providing much more computer at much less cost.

To show what we mean, we'll soon announce a startling new incentive to encourage consumers to evaluate our computers up close. There is an alternative to IBM. Watch for us.

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and the user can add titles, labels, legends, comments, grids, border shading and tick marks to enhance presentation. Graphs can be overlaid to allow comparison or combination of types.

Visi On Query tables hold up to 65000 records, each up to 1000 characters with a maximum of 256 characters per field. Users can sort, select, perform arithmetic and trigonometric manipulations and edit the database. As with other Visi On applications, data can be transferred through cutting and pasting between windows.

The Major Drawback

VisiCorp expects to develop further database products for the Visi On system. In addition, third party developers are expected to release other products for Visi On. The major drawback with the system seems to be the inability to develop software for it on the IBM-PC – either a VAX or some other UNIX system is required. Of course, most serious software developers in the US will barely hesitate over this requirement. Indeed, many of them (such as Digital Research and Software Arts) already have VAXes or Primes.

At the Sydney launch of Visi On, Brian Eisenberg (Director of International Marketing and Sales, VisiCorp) assisted by Lisa Sokol ("We'll just call her Monica") demonstrated the Visi On system and expounded the principles on which the system is founded. These form a philosophy of user interface design which ensures that all applications programs behave in a similar way – a concept which is central to the whole scheme.

Today the IBM-PC, Tomorrow ...

While Visi On was initially released for the IBM-PC, it will shortly be available for the Columbia, Chameleon, Eagle PC, TI Professional, Wang PC and Honeywell 7900. VisiCorp is working with other companies such as Applied Data Research, Informatics, Xerox and 3COM to provide further enhancements in the areas of micro-mainframe communications and local area networking.

My impressions of Visi On are favourable. While its displays are not as impressive as those of Macintosh or Lisa, its user interface follows similar principles and should pay off in ease of use and versatility. Its major drawback is the inability to run programs that are not specifically designed for the system. But then, systems that do that cannot have the 'cut and paste' transfer ability or the consistent user interface that are the key benefits of windowing systems. The true test for Visi On will come later in the year when competitive systems appear and VisiCorp demonstrates the depth of its (and the third party developers') commitment to further software support. ❑

Not another 8-bit computer running CP/M? Yes, the Multitech MIC-504 does fit this crowded category, but according to John Nicholls it has some interesting features to distinguish it from its competitors.

Multitech MIC-504

Multitech is a new name to me, and all I know about it is that the Multitech Industrial Corporation, to give its name in full, is situated in Taiwan. The layout of the MIC-504 is conventional: a system unit with two 13 cm disk drives, a 30 cm (12 inch) monitor which normally sits on top of the system unit, and a separate keyboard.

The three components are all light grey, with the monitor surrounds and disk drives picked out in black. The units are quite compact, occupying noticeably less desk space than an IBM electric typewriter. Whereas most monitors are box-shaped, this one rolls off the top-back corners, an area which is just waste space in most monitors anyway. This design has the great advantage that it makes it very difficult to place anything on top of the monitor and thereby cause overheating.

The keyboard is simple in appearance. The normal typewriter keys are in a lighter shade of grey than the others – shift, tab, return and so on, seven function keys and cursor control keys, and dedicated keys for inserting and deleting by character or line. A full numeric keypad in conventional calculator layout occupies the right side of the keyboard. This numeric pad is well-designed for data entry, with a large Enter key and a nipple on the 'five' key to assist in touch-typing.

Some aspects of the keyboard could be improved. The cursor keys are all in a single horizontal row, making it necessary to look at the keyboard to find them. The keyboard sits on four feet, and our review model must have been warped, because it rocked most disconcertingly whenever you put pressure on one corner.

The design of the monitor is clean and uncluttered, the only controls being an on-off switch and a brightness control, both on the front. The screen display is exceptionally good. It shows the customary 24 lines of 80 characters each, each character using a 7 by 11 dot matrix within a 9 by 12 field. Some sort of non-glare treatment appears to have been used, as the screen is remarkably free from glare. The text looks different from that on the IBM monochrome display, but is just as easy to read, which is the highest praise I can give it.

The system unit has the main on-off switch mounted on the back, where it is difficult to use, especially as it is a rocker type, making it hard to locate by touch. The front of the unit has a large reset button and five status lights, which I didn't find particularly useful. The disk drives are of a design that makes them impossible to close unless a disk is in the drive.

Interaction between the processor and the display was more than satisfactory. Technical specs show that the Multitech MIC-504 uses a Z80A processor operating at 4 MHz, with 64K RAM using eight 4164 memory chips. In practice, operation of the computer was quite fast, rather faster than you might expect from the 4 MHz figure.

Range of Software

If you hope to sell a microcomputer today you must include a range of software with it, and this Multitech has done. You get the CP/M operating system (version 2.2), QSORT, NAD name and address system, Magic Worksheet, Analyst and Word Right. (I understand that the latest shipments include CBASIC as well.) All the application software is produced by Structured Systems Group of Oakland, California. As well as the operating manuals for the computer and the visual display, Multitech provides comprehensive documentation for all the software; in fact the volume of documentation is rather daunting (the manuals make a stack 7 cm high!).

The system and monitor manuals were apparently written in Taiwan, and some of the language is a little unusual. I like the explanation of why it is called a 'floppy disk' – because "it gets hurt easily". The language doesn't present any real problem, but the user manuals are not very well set out. The steps for getting the computer operational and formatting the disks are not arranged in a clear, logical order (although all the information you need is in the manual) and the actual operation differs in many respects from what the manuals say.

For example, the manual says you should receive seven diskettes, whereas in fact you receive only three. These variations have no doubt occurred because the system has been changed but the documentation has not been changed at the same time. The changes would be unlikely to cause any problem to an experienced user, but a novice at computing could easily become confused. For this reason, I would not recommend this system to a novice unless the support of a knowledgeable dealer is available.

The user manual has an appendix listing three 'System Boot Message Precautions'. The gist of the explanation is that you can ignore two of them and with the third you should enter 'CTRL-C'. I think the system should be designed to avoid such potentially confusing situations.

Turning now to the software, we find that the bulkiest manual is that for CP/M. This manual, courtesy of Digital Research Inc, has no index, is divided into sections without any way of indicating where each section starts, and is largely unintelligible. Because of this daunting manual, various authors and publishers have produced a number of books along the 'Understanding CP/M' lines; I'd recommend any user who needs to know about the ins and outs of CP/M to invest in one of these.

QSORT works on records of a maximum length of 255 characters on up to five sort keys. The output file can be on a different disk from the input file to allow larger files to be sorted.

NAD (Name And Address system) is designed for lists of names, addresses, telephone numbers and so on. Selections are made from a menu listing all the available operations. One interesting feature is that the program automatically saves to disk whenever the total of records changed or added reaches ten. Although ten is the default, this can be

changed. Using NAD you can do a mail merge with Word Right.

Magic Worksheet is a spreadsheet program, and a fairly recent design, I would judge, by some of its features. It has an on-screen tutorial and full-screen HELP messages. After invoking HELP, a press of the ESCAPE key returns you to where you were before. The maximum size of the worksheet is 64 columns by 255 rows. In practice, the size is limited by the amount of memory available.

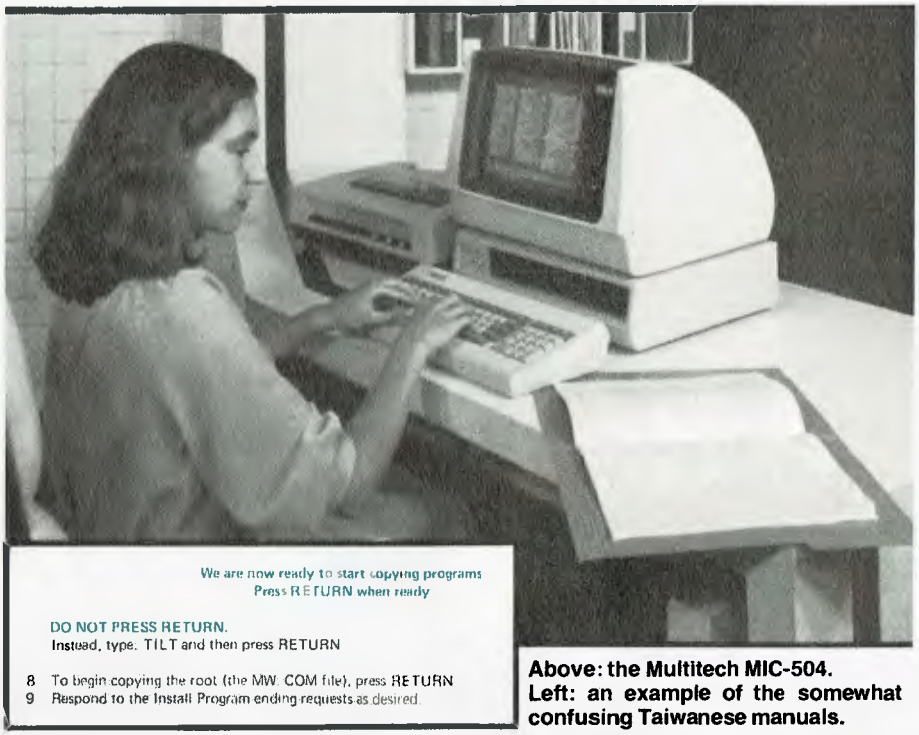
A menu of commands – spelt out in full – appears on the top line of the display and is selected by typing the initial letter of the command. Because there are more commands available than will fit on the line, an additional menu is invoked by the OTHER command.

The range of mathematical operators in Magic Worksheet is somewhat similar to those in Visicalc, although the range of formatting options is more like those available in the more sophisticated Lotus 1-2-3. This appears to be one of the better spreadsheets around and anyone familiar with one of the popular varieties should have little trouble adapting to it.

Perhaps the best way to describe Analyst is to quote from the manual: "Analyst is a general purpose information storage and retrieval tool. It keeps customer and employee records, sales statistics, inventory lists, stock portfolios, schedules, name and address lists ..." And a lot more, but you get the picture. As well as creating or modifying a data file, you can print a report or make an enquiry or extract information.

The word processing software, Word Right, also provides a tutorial and a context-sensitive help facility. The tutorial deals with the most-used commands first, before going on to the less common ones, which means you can get started very quickly. The Ctrl commands bear some resemblance to those used by WordStar, although there are differences. Word Right, however, makes no use of 'dot' commands. All the usual goodies are included; one that I particularly liked was that after an insert the text following is automatically adjusted.

The latest addition to Word Right is Spell Right. This uses a 20,000-word dictionary, which is on the small side; it does however allow you to add words to the dictionary. Words not in the dictionary are displayed – not in context – and you have the usual choices: add to dictionary, mark for checking later in context, ignore, or invoke the Help facility. No suggestions for correction are given, so you need to refer to a print dictionary if you are unsure how to spell a word. Amongst other statistics that Spell Right provides is the number of words read, a useful feature for writers who are paid by the word!



Above: the Multitech MIC-504. Left: an example of the somewhat confusing Taiwanese manuals.

Documentation

The documentation for the applications software is very good (the installation instructions added as an afterthought being an exception). Separate sections deal with installation, a background summary, the tutorial, the program commands and error messages. The error messages section not only states what is wrong but how to fix it.

In summary, the Multitech MIC-504 appears to be a well-designed 8-bit computer that comes complete with a range of well-designed, well-documented software. My only real points of criticism relate to the Taiwanese part of the documentation and to the keyboard.

The Multitech computer with all the software mentioned and all cables – including a printer cable – has a retail price of $3799 including tax. The Australian distributor is Emona Enterprises of 661 George St, Sydney; telephone (02) 212-4815. ❑

SPECIFICATION AND REPORT CARD

Unit:	Multitech MIC-504
Made by:	Multitech Industrial Corporation, Taipei, Taiwan
Processor:	Z-80A
Clock Speed:	4 MHz
RAM:	64K
ROM:	4K EPROM for bootstrapping and firmware debugger
I/O:	One RS232C serial, one Centronics parallel
Languages:	C BASIC provided
Keyboard:	Qwerty, numeric keypad, seven function keys
Display:	80 x 24 green screen
Expansion:	None mentioned in manuals
Best Points:	Software packages
Worst Points:	Taiwanese manuals

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

Extras included:	CP/M, CBASIC, QSORT, NAD, Magic Worksheet, Analyst, Word Right, Spell Right
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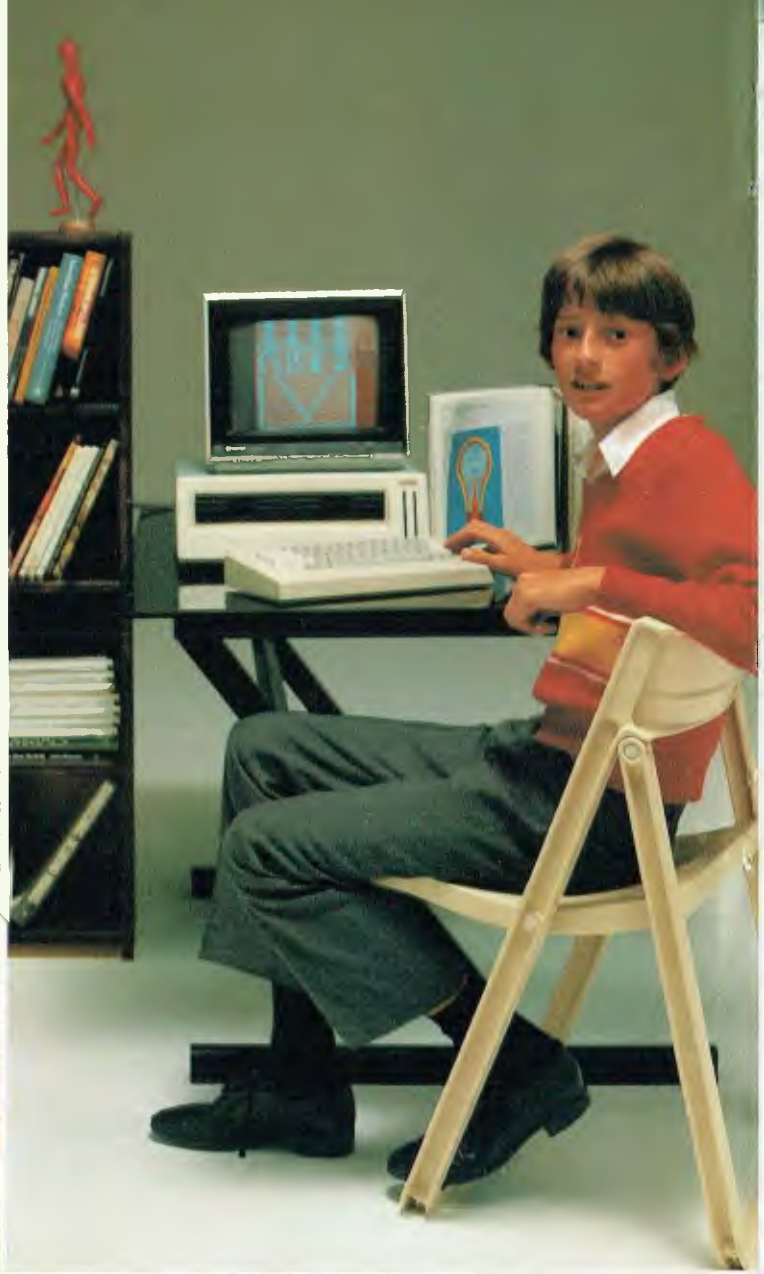

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The release of the IBM PC has somewhat overshadowed the release of another 16-bit microcomputer that promises to be at least as good in virtually every aspect, according to Mark Kosten. It is the Rainbow 100, which is manufactured by Digital Equipment Corporation, the second-largest computer manufacturer in the world. There is no doubt the computer heavies are now lumbering into the relatively new and lucrative personal computer market.

Rainbow 100

The Rainbow 100 – a rather odd name, though no odder than Apple's Lisa – has broad similarities to other machines in the same class. It comes in three parts: a system box containing the processors, ROM, RAM and disk drives; a monitor; and a keyboard. The operating system is either CP/M or MS-DOS, and expansion in memory and graphics is possible, as is the connection of printers, modems and other computers.

Before I describe the system it is worthwhile mentioning that the Rainbow is only one of four in a series of personal computers recently released by DEC. All are outwardly the same, but the processors are different; the Decmate II, an office and word processing computer, has an 8 MHz 6120 (PDP-8) with an optional addition of a Z80 CP/M 64K card, and the Professional 325 and 350 have an F-11 (PDP-11). The two Professional computers are for the big applications, as they support multi-tasking and compatibility with other PDP-11 and VAX systems. Though the baby of the family, the Rainbow is not lacking in features, and with CP/M and MS-DOS it should be a versatile machine.

Two Processors

Probably the most significant feature of the Rainbow is the inclusion of two processors in a 'single' operating system. A Z80 (8-bit) and an Intel 8088 (16-bit) are the processors. The Z80 handles disk I/O, while the 8088 controls the screen and other I/O; with a special hybrid CP/M system called CP/M-86/80, programs written in either code can be run without the operator knowing which is which. This is achieved by a 'soft sense' system, whereby object files with the .com extension imply 8-bit and .cmd files imply 16-bit programs.

However, although the operating system is CP/M it is apparently not stock-standard. I have transferred some CP/M-80 software to the Rainbow (a story in itself), which turned out to be rather difficult. The problem was two-fold; the apparently non-standard nature of CP/M-80, and the way input/output to and from the machine is handled.

There were some jumps to locations in the operating system's memory that went to strange code, resulting in crashes. Also, I/O is slow because the Z80 has to route all data through the 8088. Clearly writers of software will have to pay closer attention to the Rainbow system than to other more standard ones.

A software package made by Polygon is available, which enables all sorts of communication between the Rainbow and other computers. The Rainbow package is about $290, but, of course, you have to buy the relevant package for the other computer as well.

I will concentrate on the machine rather than the available software, which has been reviewed elsewhere. Random access memory is 64K standard, but can be expanded to 128K or a rather small maximum of 256K by the addition of either 64K or 192K boards. Disk storage is much better, with a standard 800K on two single-sided disks, expandable to 1.6M with another two disks and a further 5M or 10M with a separate Winchester. The two standard drives are in fact one, both disks being driven by one spindle but with two doors. The result is very compact compared to other disk drives, but they are also very noisy.

The processors, disk drives and ports are in the system box, a neat unit which can open up at the press of two catches, and contains all the bits and pieces in modules for easy servicing. Inserting optional boards, such as memory expansion, is very easy. All the chips are on a tray which slides out of the base of the machine. Simple instructions direct the placement of the board.

A potential problem (if it can be called that) is the nature of the hardware. There seem to be four slots for expansion (hard disk communications, graphics, extra memory), but no technical information has been forthcoming from DEC. Almost certainly part of the popularity of the Apples and IBMs of the world is the easy expansion of these systems. If the hardware side is kept in-house (which is apparently DEC's policy), then more adventurous users may be left out in the cold with regard to extra expansion of the basic system.

There are three ports: the video output to the monitor, a printer port and an I/O port for connection to a modem. The ports are the serial RS232C/RS423 type; no parallel port is included. Also, the manual says the printer port accepts only XON-XOFF signals, but it can be made to accept data (indeed, a communication problem was overcome by using the printer port as the I/O port).

The monitor, a twelve-inch (30 cm) job, is very small in outer dimensions, thus saving desk space. You can order B/W, green or amber, or a colour screen when the graphics package is optioned. The screen handles all VT100 (a popular and sophisticated terminal sold by DEC) characteristics, such as reverse video, bold, blink, underline and double-size characters. The VT100 special character set (lines, corners and some funny-looking characters) is also included. Normally 80 by 24 characters are displayed, but 132 by 24 is also possible, which is very useful for spreadsheet analysis.

Altering Features

Another feature of the VT100 terminals is the display of screen and software-driven hardware features that can be altered. Pressing 'setup' displays the number of characters across the screen and tab stops. Pressing 'next page' (one of the group of word processing keys in the centre of the keyboard) gives you a display of a multitude of features that can be changed, such as scroll speed, 80 or 132-character screen width, baud rates, parity checking and a host of others.

When the system powers up a diagnostic test is run, and if there is a fault it is displayed on the screen. There are seven LEDs next to the ports on the system box which also light in a particular sequence to show the fault, which is useful if the screen is affected by the problem.

The last item of hardware to mention is the keyboard, which is outstanding. The full QWERTY keyboard is there, as is a numeric pad, a row of function keys and a group of word processing keys that includes the arrow keys. The function keys send particular escape sequences and have labels such as interrupt, cancel, resume, do and help, but they only work with the appropriate software (certainly not CP/M). Above the function keys is a long hinged flap under which labels can be altered when particular functions are assigned to these keys. Tactile feedback from the keys is smooth, without the lack of feel of lesser keyboards.

Just a Little Gripe

Unfortunately a couple of features mar an otherwise brilliant design. The angle brackets have their own key where one would normally expect the shift key, and a mysterious key labelled 'compose character' (used with the Professional series) is next to the space bar, thus getting hit sometimes and displaying an escape sequence.

Overall the design, or 'ergodynamics' as DEC puts it, is exceptional. From the ease of servicing to the superior keyboard, attention to detail abounds.

Perhaps the major software/hardware addition to the Rainbow is the graphics board, which gives 16-colour graphics using 320 by 240 pixels or eight colours with 800 by 240 pixels. The pixels are bit-addressable, allowing quite fine drawings to be made. Unfortunately, there is, at present, no software to drive the graphics! The graphics will conform to the *de facto* standard set by GSS and the GSX-Kernel (Digital Research).

Utilities

Three additional utilities to the standard CP/M system are worth special mention: RED, a text editor; Maint, a maintenance program for disk files; and Help, which gives quite detailed help text on many CP/M commands. CP/M Plus will be available, which includes these utilities and more (most importantly, more efficient disk I/O).

RED (Rainbow EDitor) is a full screen editor, except for the first two lines which display the available commands and current mode (such as insert). It has some versatile features, such as the simple generation of memos and letters, and has an easy-to-learn command set. In fact, the editor is a simple version of Select-86, the word processor, but whereas I dislike Select as a word processor, RED is an ideal editor for everyday programming applications.

RED shares what seems to be a bug with Select. While using the editor all text is displayed in bold characters (which seems unnecessary to me). After exiting from RED or Select to CP/M everything still appears in bold.

Maint combines the action of the CP/M commands TYPE, REN(ame), ERA(se) and some STAT commands. It is very easy to use but is a bulky system for small jobs. All files are displayed with their system attributes (DIR or SYS), read status (read only or read/write) and size in kilobytes. To use one of the above commands you move to the filename using the arrow keys and hit the relevant key. It seems most useful for cleaning up large directories (especially if the hard disk option is being used).

A computer-based instruction disk is supplied that takes the user through simple concepts about what computers do, the CP/M system and some other features of the Rainbow. Going through the whole tutorial takes about two hours and is very thorough in its cover of the operating system. Even though it is aimed at the first-time user in the CP/M environment it is entertaining for the hacker to work through anyway (why do I feel like I've been using CP/M for decades?). It uses VT100 graphics symbols to animate floppy disks inserting themselves into the system box, filing cabinets opening and closing and sundry other movements.

Unfortunately, no literature describing the CP/M utilities DDT, LOAD or the Z80 or 8088 assembly languages is supplied, so presumably the user who has that sort of interest is expected to buy the documentation elsewhere.

A special diagnostic diskette is also supplied with the CP/M package which primarily runs tests on the floppy disk drives, but includes tests on the RAM banks, keyboard, video controller and other components of the system.

On the subject of floppy disks, DEC hasn't, so far, released the format program for blank disks, so it is necessary to buy DEC ones at a rather high price.

Software

Apart from the operating system, other popular software that is currently available includes the word processors Select and Wordstar and the spreadsheet program Multiplan. However, these program are expensive, but there is a growing range available from software houses. MBASIC seems to be the main programming language available, which is something of a mystery to me, as it really is unsuitable for the speed and capabilities of the Rainbow. A compiler would be much better, especially one with the ability to use the graphics.

So far, much of the software currently available is just rehashed 8080 stuff, but there is a mixture of 8-bit and 16-bit programs being offered. It is good to see that more 16-bit 128K programs are coming along (like Lotus 1-2-3 and VisiOn).

It is interesting that Digital is apparently marketing the Rainbow to the business/professional field only, unlike IBM pushing theirs to anybody who may be vaguely interested in a personal computer. This is further reflected in this version of the Rainbow, which has no facility for a cassette player, light pen or sound effects. However, there is substantial disk memory, an excellent and very long tutorial for the CP/M system, a very good, if rather elementary, ture. The first-time user, and pre the business person who m ease with such new techn catered for.

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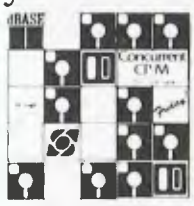

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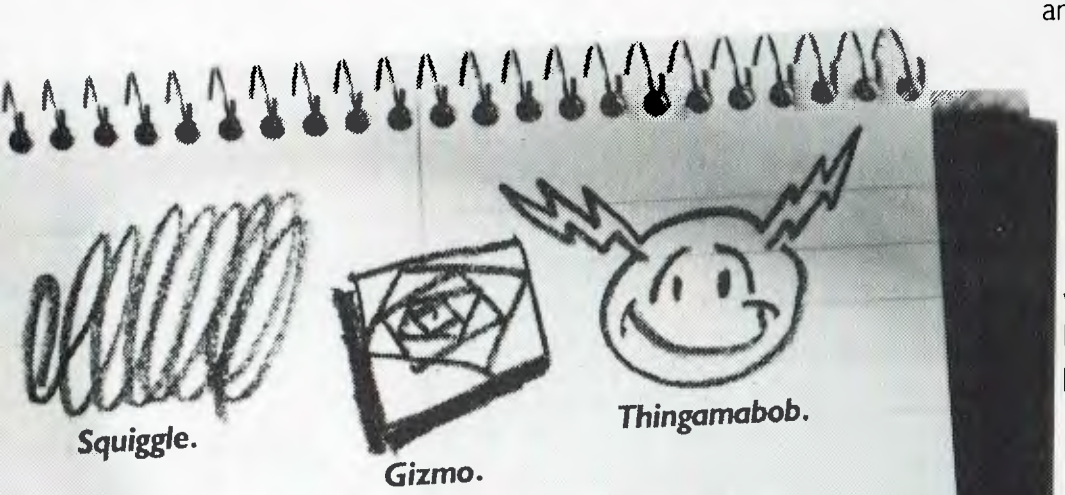

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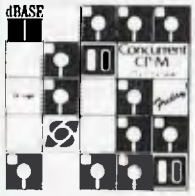

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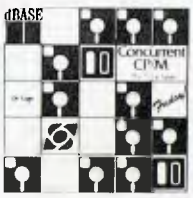

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Battle at the Edge of Time	**$22.95**
Abductor	**$19.95**
Gridrunner	**$19.95**
Matrix *(8K Exp.)*	**$21.95**
Laser Zone *(8K Exp.)*	**$21.95**
Andes Attack *(8K Exp.)*	**$19.95**
Traxx *(8K Exp.)*	**$17.95**

commodore 64

TITLES ON CASSETTE TAPE – AVAILABLE FOR C64 ON DISC NEXT MONTH

	Cassette Suggested Retail
Hover Bovver	**$29.95**
Hustler	**$22.95**
Matrix	**$22.95**
Laser Zone	**$22.95**
Attack of the Mutant Camels	**$22.95**
Gridrunner	**$21.95**

Games Coming Soon ***MASTER PIECE ★ KICK OFF ★ THE CAMELS REVENGE***

NEW GAMES SUMMARY

METAGALACTIC LLAMAS BATTLE AT THE EDGE OF TIME — A fast and original game for the unexpanded VIC 20. Challenging and colourful, with good sonics and a unique game action and design, this promises to be the most exciting new 3.5K VIC game since the introduction of GRIDRUNNER nearly a year ago.

HOVER BOVVER — A totally original arcade game for C64 featuring outstanding graphics and a sound track created by a professional Piano Wizard. Gordon Bennet has borrowed his neighbour's Air-Mo lawnmower. Mow your way through as many of the 16 lawns as you can before the pursuing neighbour retrieves his mower. Set your dog onto the neighbour to help you out of tight spots and don't annoy the Gardener. Try not to plough through the neat flower beds or overheat your mower.

HUSTLER — Unquestionably one of the best games available on the COMMODORE 64. Written in machine code and using sprite graphics to the full, HUSTLER takes game playing to new heights with its mixture of six games, for one or two players, and superb computer generated music. From Bubble Bus by Nick Strange.

MASTERPIECE— An intreguing game of logic from Pandasoft by Brett Merriman. Inspired by a famous board game. Take the challenge and break the computers colour code . . . Think you can win? . . . Don't bet on it! . . . This game proves that computers think! Available on DISK ONLY for the COMMODORE 64.

KICK OFF — From Bubble Bus by Nick Strange. Written entirely in machine code. A brilliant computer simulation of Table Football for 1 or 2 players. With 6 levels of play. Superb computer music. COMMODORE 64.

THE CAMMEL'S REVENGE — Jeff Minter's latest game. His brilliant sequel to Mutant Camels with a twist. You're the Camel. Multiple levels of play. COMMODORE 64.

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your computer text file

Commodore Replies

I AM WRITING in reply to P.A Lynch of Eaglemont, Victoria, who, in your December issue, pointed out the discrepancy in pricing of Commodore computers between the American markets and the Australian markets.

Firstly, it is important to note that the suggested retail price for the Commodore 64 in Australia is $499 and not $699 as suggested by your correspondent.

However, it is true to say that most American-made microcomputers cost considerably less in their country of origin than on the local market and the following are the major reasons:

1. Cost of freight from the USA to Australia.
2. Duty, clearance and other import charges.
3. A sales tax percentage of 20 per cent applies to all microcomputers whereas the American retail price lists do not include any tax amount.
4. A differential of approximately 10 per cent in exchange rates.
5. Very often the Australian units require different power supplies and modulators from those used in the United States. Because of the lesser volumes involved these items are more expensive to manufacture.
6. Australian domestic freight rates are higher than those in the United States.

In addition to the above factors, it is also true to say that Australian consumers expect a higher level of after sales service than their American counterparts and consequently, the retailers must have sufficient margin to enable them to provide this support.

Therefore, microcomputers will always cost more in Australia than in the United States and it is up to the individual consumers to determine which product gives them value for money, after taking into consideration their particular requirements and the range of products available.

NIGEL SHEPHERD
Managing Director
Commodore Business Machines Pty Ltd

No More Bees

THANK YOU very much for placing our letter in *YC* so often; it's a pity we no longer have a Microbee as we keep getting so many calls in reply to it! The object was for those who wanted to contact us with a view to starting a Microbee club in Melbourne. Since the time we sent the letter, early October last year, we have joined the Melbourne-based uBug club, which meets at the Burwood Teachers' College on the second Wednesday evening of each month. So a new club was not needed, and we stopped the process.

After several months of Bee-ing, we ran out of new games to play, and got thoroughly sick of waiting for tape loading of programs, with the many 'bad load' errors which go with it, and started looking for a disk system. That's when we decided we were not being kind to the people who had bought an early kit-form Bee. It was going to cost a bomb to convert the Bee we had, buy a disk system – which wasn't available anyway – and get it up and running.

The result was that we switched to the Apple system, which we managed to get up and running for about the same amount that needed spending to get a disk set-up for the Microbee. That's when we started to find out just how much tremendous software is available for the Apple system; due to the quantity of Apples sold around the world, people have written thousands of programs for it! And we can run CP/M too.

Anyway, for those kind folk who have corresponded to us about Microbees, sorry fellas, we don't got one any more!

BILL BELTON,
Tullamarine Vic.

'Heartache Territory' Revisited

MR JOHN JONES' plight is not rare – the VIC manual does jump into things quickly. To try and help, I can recommend 'An Introduction to BASIC: Part 1', by Andrew Collins. This book covers in detail setting up the computer, familiarises the user with its various parts, then proceeds to show how the computer can be used. Included are tapes with games and self-test quizzes. It is excellent for a beginner, even though it costs thirty-odd dollars from Commodore or Dick Smith.

Now it's my turn to ask for some help.

Displaying the characters in 8*16 mode is quite useful and helpful for young children. Having the 'super expander' allows most of the characters to be copied from ROM, doubled in height, and still leaves 3K for a teaching program.

Using the VIC chip registers, it is easy enough to change to the larger character mode, shorten the screen to 13 rows, and re-centre the screen. But the operating system still thinks there is the normal 23 rows, and the cursor can go right off the bottom of the screen. How can you solve this problem?

Continue the good work on the magazine, and thank you for the helpful VIC column.

A listing of the program that implements larger characters is shown below.

FABIO BARONE,
Griffith NSW

Listings

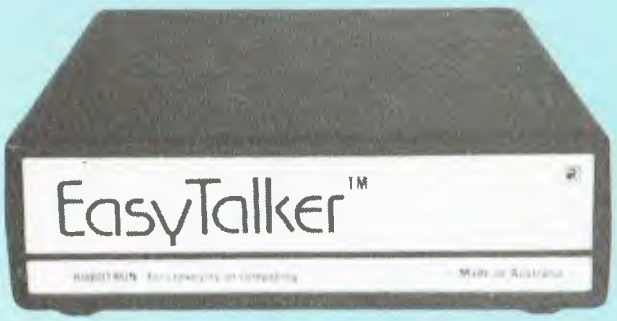
1. For unexpanded UC. Leaves 1K for a program; about 160 characters are created.

```
10    POKE 52,20:POKE 56,20:PRINT"[cleol"
      (protects our characters in RAM.)
20    FOR N=0 to 255:POKE 7680+N,N:NEXT
      (puts codes on screen)
30    POKE 36879,104
      (black border, blue screen)
40    POKE 36867,26+1
      (13 rows, 16+8 character matrix)
50    POKE 36865,32:POKE 36869,253
      (centres screen — VIC chip looks at 5120 on for character
                        information)
60    FOR N=0 to 1279:P=PEEK(32768+N)
      (creates characters)
70    POKE 5120 + 2*N,P:POKE 5120+2*N+1,P
80    NEXT
90    PRINT"[clear]LARGE LETTERS!"
      (control white)
```

2. For VIC with 3K or super expander. Almost entire character set copied.

```
10    POKE 52,16:POKE 56,16:PRINT"[clear]"
20    FOR N=0 TO 255:POKE 7680+N,N:NEXT
30    POKE 36879,104
40    POKE 36867,26+1
50    POKE 36865,32:POKE 36869,252
60    FOR N=0 to 1600:P=PEEK(32768+N)
70    POKE 4096+2*N,P:POKE4096+2*N+1,P
80    NEXT
90    PRINT"[clear](white)LARGE LETTERS!"
```

GIVE YOUR COMPUTER A PERSONALITY



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Bad Service

IT WAS with interest that I read the printer feature in the November 1983 issue of *Your Computer*. Perhaps intending ACT purchasers of printers marketed by Case Communications may be interested by my experience.

In February this year I purchased a Star DP8480 printer from the MicroBee Computer Shop at Weston in the ACT. The printer had been ordered through a Canberra firm, Information Electronics Ltd. Although it was checked and tested by staff at the shop, on unpacking the printer at home I found there was a large chip missing from the cover. I informed the store manager, who in turn requested a replacement cover from Information Electronics.

Despite numerous requests from the shop staff, no replacement cover has been forthcoming. A letter I wrote to Case Communications several months ago has not elicited a response. I am hoping this letter will jog someone's memory or conscience, otherwise my next approach will be through the ACT Consumer Affairs Bureau.

M. A. DAVIES,
Kaleen ACT.

Barren dBase World

I HAVE been delighted to read your continuing series on the use of the program dBase II.

When I bought my system the salesman really meant it when he said, "You are now the proud owner of a stand-alone system." I have found the computer world barren when it comes to obtaining or giving information. I believe, like you, that dBase II is a marvellous program, and such publications as, 'dBase II Users' Guide' and 'Everyman's Database Primer' have been particularly helpful. However, as a computer novice who has had no computer programming experience (not even BASIC) it is a great help to refer to the articles in your magazine.

Most of us get through the kindergarten stage very early – that is, beyond the 'create' and 'report' stage. I am particularly interested in various types of applications and programming techniques as well as sample 'command' programs.

As an insurance broker, the need for quick-quote systems with 'look-up' and report features and account keeping facilities are important to me. Perhaps other readers are in a similar position and could write. What about a dBase II users' column?

COLIN GRIFFITHS,
Crows Nest, NSW

New Apple Club

A NEW, non-profiting club called AUDEC (Apple Users' Disk Exchange Club) is looking for new members now. Each member will have access to programs that are entertaining and educational, as well as news, programming tips, utilities, and so on (the list is endless).

There is no fee to pay to join. Just send a spare disk filled on both sides with whatever programs you would like to contribute as many times as you like. That disk will be sent back with new programs and other information. Your contribution will be shared among other members so that new ideas can be evolved and problems can be solved. Use your 'Hello' program as a letter to introduce yourself and any instructions needed to assist operating certain programs.

I hope people will consider this seriously because there aren't many Apple Users' Clubs in New South Wales. *Your Computer*, I believe, can also help to spread this good news around Australia, since it attracts a lot of readers. This unique club will benefit a lot of remote Apple users.

PETER LAPIC,
Canley Vale NSW

More Games

I AM 14 years old and have a Commodore 64. I am writing to ask if you could supply more game programs for the Commodore 64 and the Apple IIe, for I get your magazine every month. More game programs would be very much appreciated.

DOUGLAS MENADUE,
Bowen Qld

We regularly publish both games and other types of programs in our Pocket Program Specials, and are always on the look-out for original, good games (we don't really want another version of noughts and crosses). So if anyone's written any exciting new games, send 'em in!

Tide Analysis And Prediction

TIDE PREDICTION and tide analysis provide interesting applications for microcomputers. Both can be done on even a 32K computer, provided you keep to the six or eight main tidal constituents. A prediction program has appeared in a recent issue of *Australian Marine Science Bulletin* (No. 84, October 1983; correction in No. 85). This program predicts hourly tide heights for any given dates, and for any port for which tidal constants are available. The necessary constants are not too hard to find, and predictions should be within about 10 cm of the actual tide.

Tidal analysis is the process of working out the tide constants from tide records. It is a bit more difficult than prediction, and will be of less interest, since the necessary data (typically hourly tide heights for at least a month) are much harder to come by.

This topic is probably not of wide enough interest to justify publishing programs in *Your Computer*, but I would be glad to hear from anyone interested. At least the prediction might be of interest to teachers.

B. V. HARMON,
Caringbah NSW

Where To Get Books

DURING THE early part of last year I took a course at a local CAE in FORTRAN. This course inspired me to learn a little more and so in my own time I learnt a reasonable amount of BASIC. I then bought a 32K Microbee.

I now find myself quite eager to move on and learn about assembly language or machine code. However, since it is only possible for me to learn from books, I find myself at a dead end – I have spent a reasonable amount of time in the computer shops of Ballarat looking for any books suitable for the task – but I have not found any.

Would you please recommend such material for a do-it-yourself person, and its publisher?

G. GARDOZ,
Mt Helen Vic.

Our sister publication, *Electronics Today International*, runs a mail order book service whose catalogue includes over 50 titles concerned with computer software. A few of these cover assembly language and machine code. The complete catalogue was published in *Your Computer*, December 1983, so we suggest you save your feet and shoe leather and simply have a look through that catalogue.

Help With CB-86

WHILE I am not what you would call a regular reader of *Your Computer*, I do buy a copy whenever I happen upon it in the newsagent. This, unfortunately, is not very often, as your magazine appears to be so popular that there usually aren't any copies left by the time I can tear myself away from my electronics master. I would, however, very much appreciate it if you could include this letter in the Textfile section of the magazine.

Recently, I have been doing quite a bit of programming on one of Digital Equipment's new PC s: the Rainbow-100. After much research into possible versions of BASIC to run on the Rainbow, I decided to obtain a copy of Digital Research's CB-86 compiler, which is a fully compiled, 16-bit edition of DR's CBASIC language. To anyone who is looking for a version of BASIC to run under CP/M, I can highly recommend CBASIC to them.

The only problem I have encountered with CB-86 is that I have been unable to find anyone in NSW who is also using it. I am very interested in hearing from any of your readers who are using CBASIC in any of its forms, and especially from anyone using CB-86, mainly for the purpose of exchanging ideas, discoveries, program libraries, and also the possibility of getting some of my programs compiled into 8-bit CP/M through CB-80, the 8-bit counterpart of CB-86.

The Rainbow uses dual microprocessors to speed up program run-time. It uses a Zilog Z80A 8-bit processor, as well as an Intel 8088 16-bit processor. As a result, the Rainbow is capable of running both 8 and 16-bit ▶

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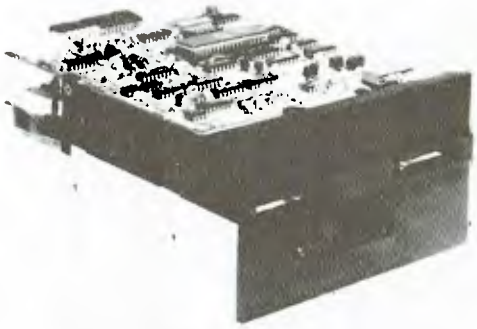

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your computer text file

CP/M simultaneously, and automatically detects what type of program you wish to run and uses the appropriate version of CP/M. It would, therefore, be very handy to have both 8-bit and 16-bit versions of some of the programs.

Depending on the response to this letter, it might also be worthwhile starting up a CBASIC users' group.

ANDREW LARKIN,
Programmer,
Bega NSW

Get Out Of Check

I RECENTLY bought Tim Hartnell's giant book of computer games, and it seems that the chess program does not work properly. When I check the king with my queen the program ignores the queen. When I bring up my bishop and put a second check on the king it moves the king off the board to row 9 behind his bishop.

Whatever my next moves, the program always moves the king off the board every time it's his move. It has no memory of moving it off the board. Can anyone help!

I am using a Superbrain with Microsoft BASIC 5.1.

I tried several other games and the noughts and crosses did not work properly either. The only one I got going properly was Chemin de Computer.

JOHN KITCHEN,
Osborne Park SA

Add Your Own Date

CONCERNING the review of the data management system Delta in *Your Computer*, December 1983, yes, it would be nice if dBase II and others had day-date routines built into them. However, there is nothing to stop one from incorporating one's own routines into dBase II or any programming language for that matter.

If one assumes that a date is validated by a routine such as the one which appeared in the Jan/Feb '83 issue of *YC*, then the following routines will allow the computation of the number of days between any two dates between 1/1/01 and 31/12/99 or the date so many days from another date in the same range.

ANTHONY L BARNETT,
Prospect SA

CONVERT DATE TO TIME INTERVAL.

```
SET TALK OFF
DO LEAPCHEK
STORE "000031059090120151181212243273304334" TO DATESTRING
STORE INT((YEAR - 1)* 365.25 + VAL($(DATESTRING,(MONTH * 3) - 2,3)) + DAY);
TO INTERVAL
IF LEAP:YEAR .AND. MONTH > 2
   STORE INTERVAL + 1 TO INTERVAL
ENDIF
SET TALK ON
```

CONVERT TIME INTERVAL TO DATE.

```
SET TALK OFF
STORE INT(INTERVAL / 365.25) TO YEAR
STORE INT(YEAR * 365.25) TO YEAR:TEMP
STORE INTERVAL - YEAR:TEMP TO DAYS:LEFT
* SPECIAL CASE OF 31ST DECEMBER IN LEAP YEAR
IF DAYS:LEFT = 0
   STORE 366 TO DAYS:LEFT
ELSE
   STORE 1 + YEAR TO YEAR
ENDIF
DO LEAPCHEK
IF DAYS:LEFT = 60 .AND. LEAP:YEAR
   STORE 2 TO MONTH
   STORE 29 TO DAY
ELSE
   STORE "031059090120151181212243273304334365" TO DATESTRING
   IF LEAP:YEAR .AND. DAYS:LEFT > 60
      STORE DAYS:LEFT - 1 TO DAYS:LEFT
   ENDIF
   STORE 1 TO KOUNT
   DO WHILE DAYS:LEFT > VAL($(DATESTRING,(KOUNT * 3) - 2,3))
      STORE KOUNT + 1 TO KOUNT
   ENDDO
   STORE KOUNT TO MONTH
   IF KOUNT = 1
      STORE DAYS:LEFT TO DAY
   ELSE
      STORE KOUNT - 1 TO KOUNT
      STORE DAYS:LEFT - VAL($(DATESTRING,(KOUNT * 3) - 2,3)) TO DAY
   ENDIF
ENDIF
SET TALK ON
```

CHECK FOR LEAP YEAR (LEAPCHEK.CMD).

```
STORE F TO LEAP:YEAR
STORE (INT(YEAR / 4) * 4) TO YEAR:TEMP
IF YEAR = YEAR:TEMP
   STORE T TO LEAP:YEAR

ENDIF
RETURN
```

```
INTERVAL        =       NO OF DAYS SINCE 1/1/01.
DAY             =       DAY OF MONTH.
MONTH           =       MONTH OF YEAR.
YEAR            =       YEAR.
```

To get the number of days between dates, convert each date to a time interval then obtain the difference.

To get a date say 40 days from the another date, convert the date to a time interval, add 40 then convert the interval back to a date.

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Getting dBest From dBase

Part VII

Les Bell continues his series on the top-selling database system with an initiation into the writing of programs.

Last month we covered the creation of command files and the use of memory variables. This month it's time to write a program.

The first program everybody writes is the 'Hello World' program. If you've never written this one before, it's simply a program that says 'Hello World' on the screen. So in dBase:

```
ERASE
? 'Hello World'
```

The ERASE command clears the screen, while the ? symbol prints the string on the screen. Terrific, huh?

While this demonstrates none of the intricacies of the dBase language, at least it shows that dBase has none of the intricacies required by other languages. In PL/I, for example, the above program is:

```
world:
proc options(main);
put skip list (ascii(26), 'Hello World');
end world;
```

That's one of the things dBase has going for it; it's relatively easy to write short programs in it. You don't even have to worry about line numbers!

However, programs are more useful if they are able to perform repetitive tasks or to make decisions based upon the values of variables. dBase provides a number of ways of doing this.

The DO WHILE statement, coupled with a matching ENDDO, is the main way of controlling a loop. For example, here is the way one would write a FOR ... NEXT loop:

```
STORE 1 TO control
DO WHILE control < 11
* main body of loop
? control
STORE control + 1 to control
ENDDO
```

This will print the numbers from 1 to 10 on the screen. Since dBase is a database manipulation language, a more common use of the DO WHILE statement is to process a database file from beginning to end. Like most languages, dBase has a function called EOF, which returns true when the file system reads the end-of-file marker. So, to process a database file, the following dBase fragment will do the job:

```
GO TOP
DO WHILE .NOT. EOF
* main body of loop
SKIP
ENDDO
```

Here, the SKIP instruction moves the file pointer on to the next record. Once the final record has been processed, the SKIP instruction will attempt to move the file pointer on, but instead it will bump into the end-of-file marker. At the top of the loop, the WHILE condition will now evaluate to false, and so the body of the loop will not be executed.

As mentioned above, it is also useful to be able to act in different ways under different conditions. In dBase, as in many other languages, this is achieved with the IF ... ENDIF statement. In some languages, the operation of IF statements can seem rather ambiguous thanks to the lack of clear indication where the scope of an IF ends, but in dBase the ENDIF makes it absolutely clear. So here's an example of the IF construct:

```
IF zot > foobar
range = zot - foobar
ENDIF
```

Notice that the action to be performed if the condition is true is on a separate line from the IF statement itself, a different style from most languages. Note also that you are not restricted to just one statement following the IF; you can have as many as required – just finish with an ENDIF.

dBase also allows the use of an ELSE clause so that one or other of two alternatives is executed:

```
IF mgross < 0
tax = 0
ELSE
tax = mgross * 0.46
ENDIF
```

While the IF ... ELSE ... ENDIF construct allows the selection of one of two courses of action, a frequent occurrence is the requirement to select one of many alternatives. This is done by the DO CASE statement, which takes the general form:

```
DO CASE
CASE expression1
statements
CASE expression2
statements
CASE expression3
statements
OTHERWISE
statements
ENDCASE
```

This allows the programmer to handle any number of separate cases, plus a final set of statements to handle the situation when none of the cases is true.

The major use of this expression is in menus, where the user has to select one of several alternatives. Here's an example:

```
ERASE
DO WHILE t
@ 5,12 SAY 'Add Names'
@ 6,12 SAY 'Delete Names'
@ 7,12 SAY 'Quit'
@ 21,12 SAT 'Choice'
SET CONSOLE OFF
WAIT TO mchoice
SET CONSOLE ON
mchoice = !(mchoice)
DO CASE
CASE mchoice = 'A'   DO addnam
CASE mchoice = 'B'   DO delnam
CASE mchoice = 'Q'   ERASE
CANCEL
OTHERWISE
? CHR(7)
ENDCASE
ENDDO
```

This example shows a few new features of dBase. First, we have not previously seen the ERASE command; it simply clears the screen (think of CLS in TRS-80 BASIC). Next the DO WHILE t statement: in this case, t is not a variable – instead it is the logical constant true. The result of this is that true is al- ▶

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ways true, therefore the loop always executes. The only way out of it is to select 'Q'.

Next there's the @ commands, which position the cursor on the screen before output, and the SAY commands which actually perform the output. The dBase screen extends from 0,0 in the top left corner to 23,79 in the bottom right. So the first three @ ... SAYs output the menu choices on three successive lines, 12 spaces in from the left-hand edge of the screen. We'll see a lot more of @ ... SAY later.

Wait For It

The WAIT TO statement gets the single-character selection from the user, and the SET CONSOLE commands which bracket it simply suppress the appearance of the WAITING message that would otherwise mess up our otherwise beautiful screen. A curious fact about users is that they think that 'a' and 'A' are the same letter – which they obviously aren't. To overcome this, we convert any lower-case input to upper-case, using the !() function.

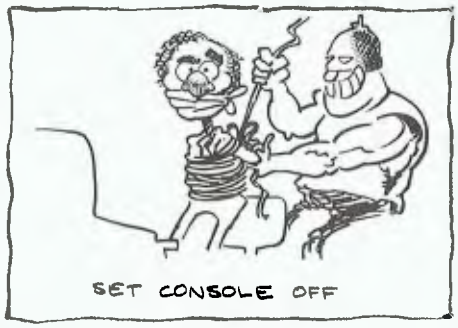
Now comes the case statement. In the first two cases, we respond to the user's request by running a command file (ADDNAM.CMD or DELNAM.CMD), but notice if you're trying this example that if you don't create these files you'll get an error message. Even empty files will do, though then you won't see much happening.

For the quit option, we clear the screen before CANCELling the current and higher command files – in other words, returning to the command level. Finally, if we haven't recognised the user's input by this stage, we print ASCII character number seven, which rings the bell or beeps, and then redisplay the menu.

Our major example this month is a simple report on the bookshop database. You may recall that the BKINV.DBF has too many fields to list on an 80-column printer; if you're lucky, yours may wrap around automatically, but mine just overtypes the same line. How then can you print the contents of the database?

This program lists the contents of the database on five lines, with a sixth line of dashes to separate each record from the next. It also automatically inserts page breaks.

```
SET TALK OFF
USE bkinv
SET FORMAT TO PRINT
SET MARGIN TO 0
DO WHILE .NOT. EOF
  STORE 0 TO count
DO WHILE count [ 10 .AND. .NOT. EOF
    STORE count * 6 TO pagepos
    @ pagepos+0, 0 SAY "Stock Numbner:"
    @ pagepos+0,14 SAY stockno
    @ pagepos+1, 0 SAY "Title:"
    @ pagepos+1, 8 SAY title
```




```
    @ pagepos+2, 0 SAY "Author:"
    @ pagepos+2, 8 SAY author
    @ pagepos+3, 0 SAY "Publisher:"
    @ pagepos+3,11 SAY publisher
    @ pagepos+3,27 SAY "Sell Price:"
    @ pagepos+3,39 SAY sell:price
    @ pagepos+3,53 SAY "Buy Price"
    @ pagepos+3,64 SAY buy:price
    @ pagepos+4, 0 SAY "Stock on Hand:"
    @ pagepos+4,15 SAY stock
    @ pagepos+4,27 SAY "Back Ordered"
    @ pagepos+4,41 SAY backorder
    @ pagepos+4,53 SAY "Reorder Level"
    @ pagepos+4,68 SAY reorder
    @ pagepos+5,30 SAY "----------"
    SKIP
    STORE count+1 TO count
  ENDDO
ENDDO
SET FORMAT TO SCREEN
```

This is a reasonably straightforward program – it looks more complex than it really is. The first few statements open the database file and set the initial conditions. SET FORMAT TO PRINT means that subsequent @ ... SAYs will be sent to the printer.

We have decided to print a record over six lines, which means that we can fit ten on a page. So we first of all set up a main loop which prints a page at a time – that's the DO WHILE .NOT. EOF. To print a page, we simply count ten records. Note, however, that if we are only five records away from the end of the file when we start printing, we can't print ten records (actually we'll get the last record printed six times). So we have to include a test for end-of-file in the inner loop as well.

Next we work out the line where this particular record should be printed on the page – that's count times six. Then we print the record, starting at that line.

When an @ ... SAY is sent to the printer, dBase examines the line number in relation to its current line position. If it is already past that position, it will automatically insert a page eject and go to the right position on the next page – a feature we count on to get page ejects every ten records, as pagepos goes from 54 to 0.

At the end of the loop we skip forward in the database, increment count and we're done. One thing to watch about this (and other) command files is that it leaves TALK set OFF, so that if you are experimenting with dBase, or making ad hoc enquiries using SUM or COUNT, everything will go quiet. ❑

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The Ultimate Adventure

Look out, all you Adventure freaks – Glen Thornley reckons this one will keep you out of everyone's hair for a long, long, time.

ULTIMA II is its name, subtitled 'The Revenge of the Enchantress'. It is the second Ultima by Lord British and On-Line Inc.

The story continues where Ultima One left off. The resume begins...

"When the archevil Mondain was finally overcome by a gallant knight (was it you?), rumours abounded. The most fearful one was that, at the time of his demise, Mondain had been training an apprentice, a protege with amazingly powerful, natural, magical abilities. The rumour was squelched when colleagues of his conqueror entered his castle and found no one, nor any sign of anyone ... " And so you are thrust into the realm of Lord British, to seek and destroy the evil and powerful Enchantress, Minax, who is driven by a lust to avenge Mondain's death.

This kind of thing is the ultimate aim of many of the upper bracket of Adventure games, Wizardry's 'Proving Grounds of the Mad Overlord', for example. Ultima II, however, has one or two extra features.

One still has dungeons to explore, but also towers, towns, villages and castles. The entire globe can be traversed in the hunt for, primarily, food, equipment and experience, and eventually Minax herself. And if you tire of walking, you can, for a mere 80 or so pieces of gold (depending on how good you are at bartering), buy a horse. Alternatively, you could board a frigate. You may, or may not, be accepted by its crew.

While in a town or village you can roam freely, talk with the townsfolk, visit the local pizza joint or Fred's fish and chip shop, and so on. Or you could visit the pub. People seem to give away more clues in a state of partial inebriation, or you could tip the barman for a clue, or even buy a drink! Of course, the towns also have places to buy spells, weapons and armour.

The guards in castles, towns, or villages will leave you alone so long as you don't try stealing things, or killing people (even if they attack you first), or doing anything else you shouldn't. If you do provoke the anger of the guards, it is a good idea to first plan an escape route. Guards are big brutes, devilishly hard to kill, and most anxious to see justice done. If you get bailed up by even as few as two or three of them, you could conceivably find yourself in a major spot of bother.

GAME REVIEW

If you should decide that the BC time period in which you began the game does not hold all your answers, simply step into a blue Time Door, to be transported to another part of the globe in another time zone. There are five time zones: 'Legends', the time before time; 'Pangea', the time when earth is still forming; 'BC', just before the dawn of civilisation as history records it; 'AD', the present – specifically 1990; and 'Aftermath', the post-devastation period once thought of as the future.

Included with the game is a 'Time Map', printed on cloth, which shows a rough map of the world as we know it, with approximate locations of the time doors, and the time zones in which the doors appear. It is a little confusing to start with, but with effort becomes an invaluable tool.

If after exploring the entire globe five times over, you still can't find all the answers you want, it is possible to 'obtain' a rocket, from a logically positioned base, and explore all the planets of our Solar System. Two Solar System maps, one in the instruction book, and another (the same) on a handy little card, show the Solar System, with Xeno, Yako, Zabo co-ordinates for hyper-drive to each of the *known* solar planets.

What You See ...

The game itself is all in one of three types of high-res graphics, complete with sound effects. The principle type of graphic display is that of a full-colour map, which moves up/down/left/right underneath the central character as he/she walks, rides, sails, or flies around the surface of any planet. This display is also used inside castles, towns, and villages.

The second type of graphics is a 3D display of a maze, used inside towers and dungeons, and the third is a moving 3D display showing stars zipping by as you orbit a planet, or drift in deep space.

What You Hear ...

The sound effects range from "well ... OK" to *"brilliant"*. The tonal quality is in places absolutely marvellous, but this is severely let down, occasionally, by some very mundane noises. For example, the sound given to the firing of a frigate's cannon may not be entirely authentic, but it would have to be the

best effort I have ever heard; likewise the blood-curdling scream heard when one steps into a trap in a tower or dungeon. (It would scare anyone, especially in the middle of the night, when it's not expected.) On the other hand, there is the very boring "tick tick tick tick" of a biplane's engine. It is true, however, that the good effects outnumber the bad ones.

How It Works

One major plus for this game is the fact that it is what I like to call 'non-self-destructive'. That is, when you have completed your adventure, the game disks are still in original condition. You could then, for example, swap the whole system with a friend for another one, and neither of you would be disadvantaged by the disks having been used.

This is how it works. First, you duplicate the Player Master disk (on the back of the Program Master) onto a blank disk, with any standard copy program, such as COPYA on the Apple's System Master. Then you boot the Program Master, select the Create Character option from the menu, and store your character onto the blank disk that you just copied the Player Master onto. (Confusing, isn't it!) From then on, whenever you want to use Ultima, boot the rnaster disk, insert your player disk (when prompted) and away you go! In short, all the action takes place on a copy of the disk.

Characters in Ultima II have six attributes: strength, agility, stamina, charisma, wisdom and intelligence. Ninety points are given, to be allocated between the attributes as you like, with a minimum of ten points for each category.

After this, selection of race (human, Elvin, Dwarven or Hobbit), profession (fighter, cleric, wizard or thief), and sex (male or female) further increases specific attributes by five or ten points each. In the course of the game, up to 99 points may be obtained for each attribute, but you must first find out how to obtain them. If by some unfortunate incident your character is killed, all you do is turn off the computer. Next time, you will start just before your character was killed.

And What You Get ...

The game is supplied on two disks, one double-sided, in a sturdy cardboard box. Also included in the box is the colour printed cloth Time Map, a card showing all the keyletter commands and a Galactic Map of the solar system, an 18-page instruction booklet, and a product registration card from On-Line.

Purchasing this game did cause a slight pain in the hip-pocket nerve, at least until I had played it. It cost me $81.95, but perhaps in these inflated times that is not as big a pain as one might expect to have to pay for a game of this outstanding quality.

Most software supplies will have Ultima II (it's distributed by Imagineering); if they don't, recommend that they get it! ❑

Software Report Card

Program:	Ultima II
Made by:	Lord British/On-Line Inc.
Useful for:	Hours of separation from kids/wives/families/pets/work
Hardware required:	Apple II, disk drive; colour video helps.

Ratings:	excellent	very good	good	poor
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Speed:	•			
Support:		•		
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Learning With The Tortoise

As a teacher of computer studies and maths in a Victorian high school, Peter Thacker had long seen the need for a program along the lines of 'Turtle' or 'Logo' for the VIC-20. The commercially available versions either cost too much or didn't perform well enough, so Peter wrote his own – and called it 'Tortoise'.

THE TORTOISE program differs slightly from a popular program called Turtle, but it is completely original in all respects apart from performance.

The hardware required is a VIC-20, Superexpander cartridge, 8K cartridge minimum, Datasette recorder or 1540 disk drive, and a mother/expansion board (to house the cartridges).

How To Use Tortoise

The Tortoise is a small creature that sits in the middle of the TV screen and carries with it a pen. On being given instructions on how to move it will drag its pen as it walks, drawing diagrams as it goes.

The Tortoise program contains ways to save your tortoise instructions on disk or tape and to edit them at will. It also doesn't accept invalid instructions at the time you are entering them, thus reducing sources of error. Should you enter an illogical command that is otherwise syntactically correct, the exact place of the error will be highlighted and you can then edit it and correct it.

Summary Of Tortoise Commands

F100: means the Tortoise must walk forward 100 steps; this number can be any number. The Tortoise starts in the middle of the screen facing upwards with its pen on the paper. Initially, it can walk 500 steps in any direction without going off the screen. Should it go off the screen a star will flash in the top left-hand corner, but the program will not in any way be upset, thus allowing the Tortoise to return to the screen.

R45: means the Tortoise must turn right 45 degrees. The number can be any number, including negatives. Initially the Tortoise is facing up the screen, so R180 will make it turn about face.

L90: similar to 'R', this command will make the Tortoise turn left 90 degrees.

U: this command tells the Tortoise to lift its pen off the screen. From then on it will walk around without leaving a mark where it has been.

D: this is the opposite to U and tells the Tortoise to walk around, from then on, with its pen on the screen.

(---)8: is an example of how to tell the Tortoise to repeat a certain procedure eight times. Simply enclose in brackets the set of commands to be repeated and follow the right bracket with the number of times it is to be carried out. The repetitions can be from 1 to 99 and the brackets can be nested to a depth of two; for example:

(F100R90)4
or
((F50R45)8R45)8

are two possible combinations.

Additional Commands Not Available On Turtle

H: makes the Tortoise return home, that is to the centre of the screen facing upwards with its pen down on the screen, as in the beginning.

A and S: are two variables, originally intended to stand for Angle size and Step length, but which may be used for whatever purpose you see fit.

Examples:

FS will make the Tortoise walk forward S steps. Since S is a variable it may be altered to produce some interesting patterns like spirals.

RA will make the Tortoise turn right A degrees.

= + − * /: are variable operators that are used to alter the value of the variables.

Examples:

A=30 will make the variable A equal to 30

S+100 will add 100 to the value of S. This will become the new value of S. (compare BASIC S=S+100).

A*2 will multiply the value of A by 2 and this will be the new value of A.

S/3 will divide S by 3, and this will be the new value of S. Note that you cannot divide by zero and the program is protected against this.

Control Commands

These are special keys designed for a specific purpose.

DEL key: allows you to delete a character as you enter the Tortoise program or when you are in the EDIT mode (described later). If you hold down the DEL key you will erase commands right back to the first instruction you entered, at which time the ready prompt > will appear and further pressing of the DEL key will be ignored.

Return: will tell the computer to execute the Tortoise commands after you have entered them or after you have finished editing them.

The following commands require a dot (.) to be displayed in the lower left-hand corner. This dot indicates that the Tortoise has finished executing the current set of commands.

N: will clear the computer's Tortoise memory and prepare the Tortoise for a new set of commands.

C: same as N but the screen isn't cleared. This allows a diagram to be progressively built up a bit at a time. C stands for continue.

Q: stands for quit and allows you to turn the Tortoise off and leave the Tortoise program.

Edit Mode

← : placed on the top left of the computer keyboard, this command will place the Tortoise in the EDIT mode – note that the dot must be displayed as above. Pressing the return key will leave the EDIT mode and run the Tortoise program you have finished editing.

⇒ : will move the cursor to the right in the EDIT mode only, otherwise its use produces nothing. (Note: If the cursor lies over a space it will appear invisible. Also, unlike in BASIC, if you create gaps with the INSert key and move over these with the cursor right key the special cursor right key symbols do not appear.)

<= : will cause the cursor to move to the left.

DEL: will delete a character as in BASIC.

INS: will create a gap for a character as in BASIC.

RETURN: will leave the EDIT mode and execute the set of Tortoise instructions. Although the program is designed to remove any gaps you may have left in your program, try to remove these before pressing the return key.

Other Instructions

These again require the dot to be displayed:

L: will allow you to load a previously saved Tortoise program from disk or tape. Once the program has been loaded it can be edited or run. To run it you must press the @ key.

S: will allow you to save the Tortoise program on disk or tape. After pressing S you will be asked for a name to save the program under. After it has been saved you can do anything you like, as in the LOAD case.

ABORT: if you pressed S or L, as in the above two cases, and decide you don't want to load or save, you should enter the word ABORT and press return, and the load or save command will be ignored. Proceed as if you had successfully used load or save.

@: once a Tortoise program has been ▶

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run it may be re-run by pressing the @ key. This key is the only way to run a program that has been saved or loaded.
↑ : if for some reason the display of your Tortoise program has disappeared, pressing this key will make it reappear.

Errors

The program has been written to trap errors. If you enter a key that doesn't make sense it will not be accepted and no damage will be done.

However, this will not detect logical mistakes. These are catered for when the Tortoise program is run. The place where the mistake occurs will be printed in reverse along with rest of the program. On pressing the return key you will enter the EDIT mode automatically, where the mistake can be fixed. As an example, this program will be accepted, but later on running it will be displayed with the error highlighted:

F100R90U8 – the mistake here is that U8 doesn't make sense: up eight times with the pen?

A Set Of Steps To Draw A Square

Turn on the computer and load the Tortoise program from disk or tape. As it is written the disk version will automatically load/save from/to the disk drive and the tape version the tape recorder.

Type RUN and press return. A summary of instructions will appear; press any key to see the remainder of these instructions.

You will then be given the option to run the Tortoise or quit the program. Press T.

The screen will clear and the > prompt should appear. You are now ready to enter your commands.

To draw a square of side length 100 steps you will need to enter this set of Tortoise commands:

F100 R90 F100 R90 F100 R90 F100 R90

(Spaces appear here only to make it easier to read and should not be entered).

This will cause the Tortoise to walk up the screen 100 steps, then turn right 90 degrees – this is the first side of the square. The Tortoise will then walk forward another 100 steps (this time to the right because this is the way it is facing) and then turn right 90 degrees. This will complete the second side. The remainder of the program draws the third and fourth sides.

If in doubt as to what the program does, try following the commands on a piece of paper with a pencil.

Type the program in and press the return key. A square will be slowly constructed on the screen and a dot will appear in the lower left-hand corner indicating that it is finished.

Let's try another Tortoise program. Press N for a new program (the screen should clear and the prompt > symbol will appear).

As a demonstration, let's draw the square again in a simpler way. Notice that the sequence F100R90 appears four times. It could have been written as:

(F100R90)4

- that is, do F100R90 four times.

Type in this program and run it by pressing return. The square should reappear and also the dot in the corner.

Let's save it on disk (or tape). Press S and then, when asked, enter a name for your program, maybe SQUARE, and press return. The program will now be saved and the familiar Tortoise page should reappear. If it doesn't then press the return key.

Let's EDIT this program so it will produce a square of side length 200 steps. Press the ← key and you will be in the EDIT mode – this is indicated by a flashing cursor.

Use the cursor right key to move the cursor over the 1 and then press 2. This completes our editing so press return and a square of 200 steps will be drawn.

Before editing (F100R90)4.

After editing (F200R90)4

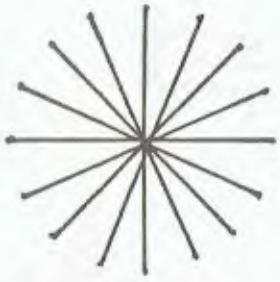
Included in this article are some Tortoise designs with the programs that will draw them.

Too Many Features

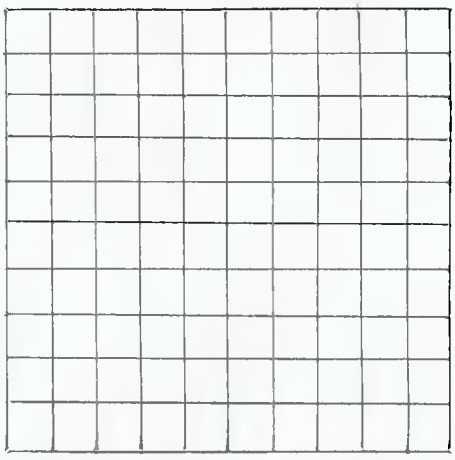
While this program was developed on a VIC-20 that had the 16K memory expansion cartridge attached, I am sure it will operate using the 8K cartridge. Unfortunately, the program has too many features to allow it to operate with only the Superexpander plugged in.

If anyone would like a copy of this program on disk or tape I am prepared to send them a copy for $15, which will cover the cost of the disk or tape and posting it to them – please specify whether you want the disk or tape version. Write to:

Peter Thacker,
Flat 3, 2 Johnson Street,
Birchip 3483



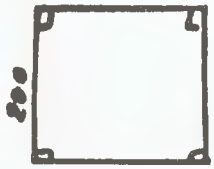
A=0(HRAF200A+22.5)16



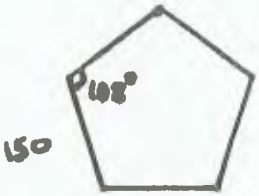
UL135F300R135D(F500R90F50R90F500L90F50L90)5
F500L180F500R90)2

TRY THESE TORTOISE PROGRAMS:

1/ ((F200R90)4R18)20
2/ ((F100R60)6R120F100L60)6
3/ UL90F300R90D(F90R18)20
4/ A=0(HRAF200R90F200A+90)4



(F100R90)4



L18(F150R72)5

(F200R90)4F200
R30(F200R120)3

(F200R45)8

R30(F200R120)3

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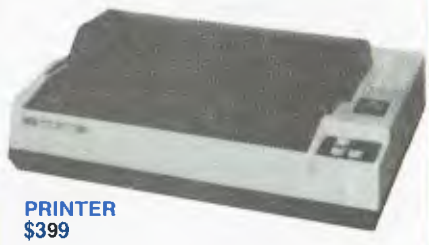

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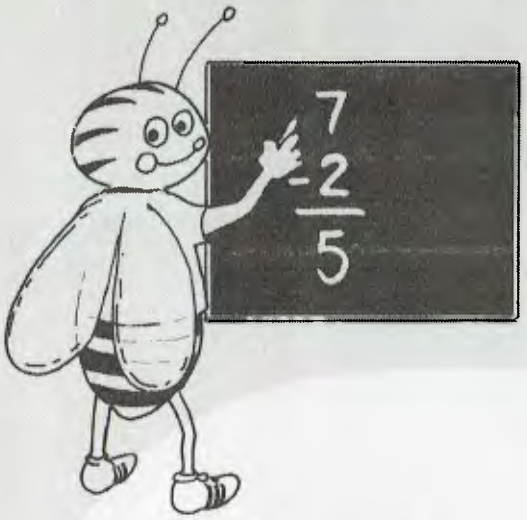
The Tortoise Program

```
READY.

I POKE36879,27:PRINT"■"
I0 PRINT"□":POKE36865,150:FORI=1TO1000:NEXT
20 PRINT"□■■■■■■■■■■■■■■■■■■TORTOISE"
30 FORI=150TO38STEP-1:FORJ=ITO10:NEXTJ:POKE36865,1
35 POKE36878,15:POKE36874,200-I:NEXT:POKE36874,0
40 A$="P THACKER (1982)":FORI=ITO8:PRINT"■■■■■■■■■■■■■■■■■■
```



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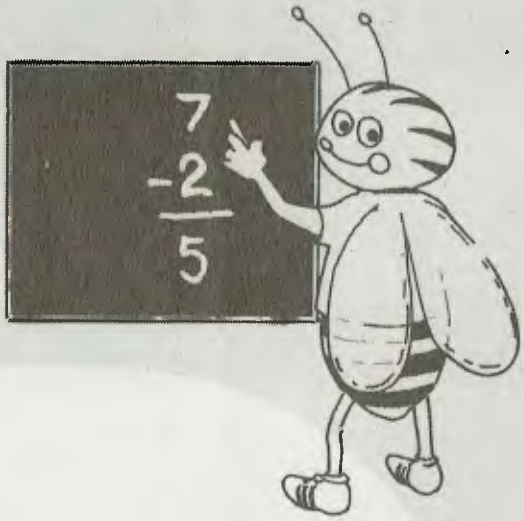

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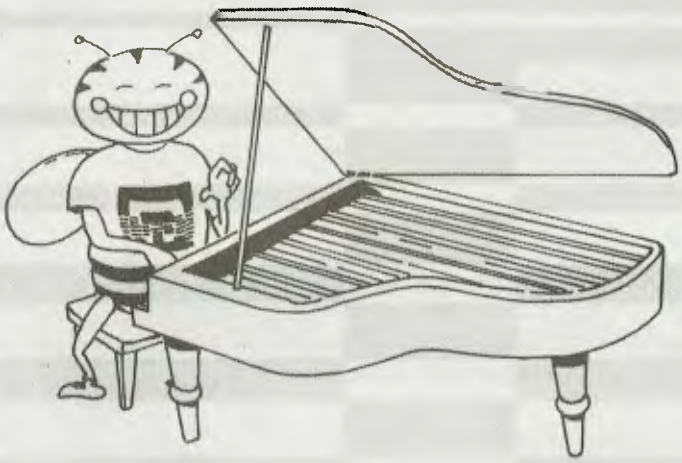

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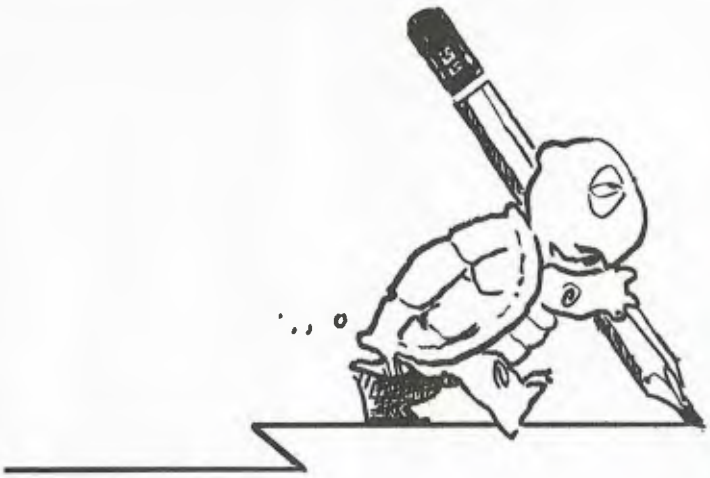

```
1790 IFM$="*"THENM1=NUM:GOTO1840
1800 IFM$="+"THENM1=M1+NUM:GOTO1840
1810 IFM$="-"THENM1=M1-NUM:GOTO1840
1820 IFM$="&"THENM1=M1&NUM:GOTO1940
1830 IFM$="/"ANDNUM<>0THENM1=M1/NUM
1840 I=I5-1:RETURN
1850 J=I+2
1860 I5=J+1
1870 M$=MID$(A$,I5,1)
1880 IFM$="R"ORM$="L"ORM$="H"ORM$="("ORM$=")"ORM$="U"ORM$="D"ORM$="S"ORM$="A"THE
N1910
1890 IFM$="F"THEN1910
1900 I5=I5+1:GOTO1870
1910 NUM=VAL(MID$(A$,J,I5-J))
1920 M$=MID$(A$,I+1,1)
1930 IFM$="*"THENM2=NUM:GOTO1980
1940 IFM$="+"THENM2=M2+NUM:GOTO1980
1950 IFM$="-"THENM2=M2-NUM:GOTO1980
1960 IFM$="&"THENM2=M2&NUM:GOTO1980
1970 IFM$="/"ANDNUM<>0THENM2=M2/NUM
1980 I=I5-1 RETURN
1990 GRAPHIC0
2000 PRINT"SAVE TORTOISE PROGRAM"
2010 PRINT"NAME OF FILE:"
2020 INPUTN$:IFN$="ABORT"THEN330
2030 OPEN1,8,3,"@:"+N$+",S,W"
2040 PRINT#1,A$;CHR$(13)
2050 CLOSE1
2060 GRAPHIC2:COLOR0,0,1,0:B$="↑":GOTO650
2070 GRAPHIC0
2080 PRINT"LOAD TORTOISE PROGRAM"
2090 PRINT"NAME OF FILE:"
2100 INPUTN$:IFN$="ABORT"THEN330
2105 CLOSE15:OPEN15,8,15
2110 OPEN1,8,3,N$+",S,R"
2115 INPUT#15,ER:IFERTHENCLOSE1:CLOSE15:PRINT"DOESN'T EXIST":GOTO2090
2120 A$=""
2130 GET#1,B$:IFB$=CHR$(13)THEN2150
2140 A$=A$+B$:GOTO2130
2150 CLOSE1
2160 OPEN1,8,15:INPUT#1,A:CLOSE1:IFA=0THEN2200
2170 PRINT"FILE NOT FOUND"
2180 GETB$:IFB$=""THEN2180
2190 GOTO2090
2200 GRAPHIC2:COLOR0,0,1,0:B$="↑":GOTO650
2210 PO=1
2220 GOSUB2300:CHAR0,0,C$
2230 GETB$:IFB$=""THENGOSUB2470:GOTO2230
2250 IFB$=CHR$(13)THENB$="@":GOSUB2490:GOTO670
2260 IFB$<>CHR$(29)THEN2290
2270 PO=PO+1:IFPO>LEN(A$)THENPO=LEN(A$)
2280 GOTO2220
2290 IFB$<>CHR$(157)THEN2320
2300 PO=PO-1:IFPO<ITHENPO=I
2310 GOTO2220
2320 IFB$=CHR$(20)THENGOSUB2420:GOSUB2300 CHAR0,0,C$+" ":GOTO2230
2330 IFB$=CHR$(148)THENGOSUB2450:GOTO2220
2340 GOSUB1100:IFZ=1THEN2230
2350 IFPO=1THENA$=B$+RIGHT$(A$,LEN(A$)-I):PO=2:GOTO2220
2360 IFPO=LEN(A$)THENA$=LEFT$(A$,PO-1)+B$+"U":PO=PO+1:GOTO2220
2370 A$=LEFT$(A$,PO-1)+B$+RIGHT$(A$,LEN(A$)-PO):PO=PO+1:GOTO2220
2380 IFPO=1THENC$=CHR$(32)+MID$(A$,2,LEN(A$)-2):RETURN
2390 IFPO=LEN(A$)-ITHENC$=LEFT$(A$,PO-1)+CHR$(32):RETURN
2400 IFPO=LEN(A$)THENC$=LEFT$(A$,PO-1)+CHR$(32):RETURN
2410 C$=MID$(A$,1,PO-1)+CHR$(32)+MID$(A$,PO+1,LEN(A$)-PO-1):RETURN
2420 IFPO=1THENRETURN
2430 IFPO=2THENA$=RIGHT$(A$,LEN(A$)-1):PO=1:RETURN
2440 A$=LEFT$(A$,PO-2)+RIGHT$(A$,LEN(A$)-PO+1):PO=PO-1:RETURN
2450 IFPO=1THENA$=" "+A$ RETURN
2460 A$=LEFT$(A$,PO-1)+" "+RIGHT$(A$,LEN(A$)-PO+1):RETURN
2470 FORI=1TO200:NEXT:CHAR0,0,LEFT$(A$,LEN(A$)-1)
2480 FORI=1TO200:NEXT:CHAR0,0,C$:RETURN
2490 I=1
2500 IFMID$(A$,I,1)=" "THENGOSUB2530 GOTO2500
2510 IFMID$(A$,I,1)="U"THENRETURN
2520 I=I+1 GOTO2500
2530 IFI=1THENA$=RIGHT$(A$,LEN(A$)-1):RETURN
2540 IFI=LEN(A$)THENA$=LEFT$(A$,LEN(A$)-1):RETURN
2550 A$=LEFT$(A$,I-1)+RIGHT$(A$,LEN(A$)-I):RETURN
2560 I6=ASC(MID$(A$,PN+1,1))
2570 IFI6<48ORI6>57THENI6=1:GOTO2650
2580 I6=ASC(MID$(A$,PN+2,1))
2590 IFI6<48ORI6>57THENI6=2:GOTO2650
2600 I6=ASC(MID$(A$,PN+3,1))
2610 IFI6<48ORI6>57THENI6=3:GOTO2650
2620 GOSUB190
2630 GETB$ IFB$=""THEN2630
2640 GOTO600
2650 NR=VAL(MID$(A$,PN,I6))
2660 PN=I6:RETURN

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DELETE LINES 2105 2115 2160 2170 2180 2190

CHANGE THESE LINES
2030 OPEN 1,1,1,N$
2110 OPEN 1,1,0,N$
```


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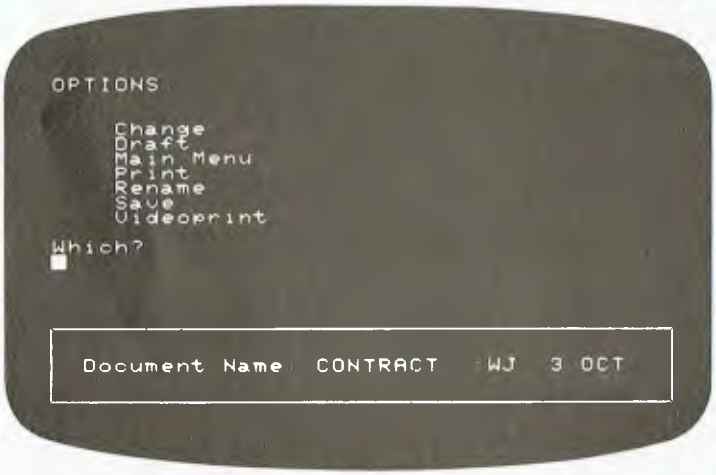

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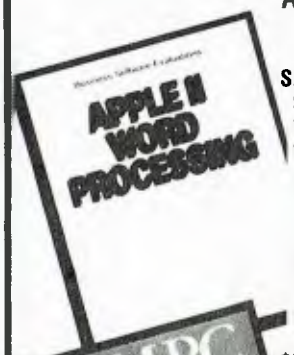

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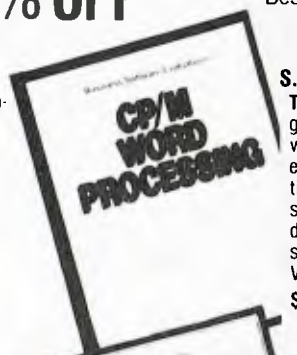

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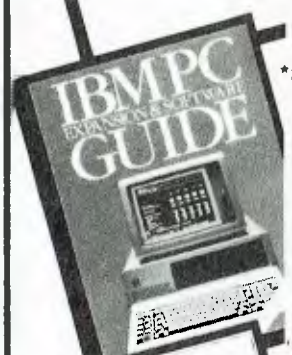

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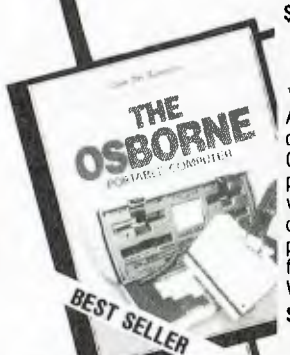

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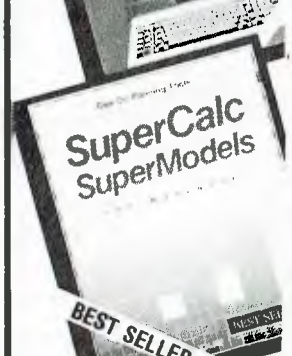

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your computer tutorial

Understanding Assembler — Part XVI

Last time we looked at the macro definitions which are built in to the MAC and RMAC assemblers. This month, it's time to investigate how to write your own macros.

THE MOST IMPORTANT application of macros is the definition of your own library of functions. These fall into a number of areas; the most common ones are input/output, operating system calls and expanded language facilities. We'll look at each of these in turn.

Macro substitution involves the replacement of a single-line pseudo-instruction in the original assembly language code with a sequence of instructions which actually perform the desired function. At the simplest level, it's very simple, but when extending its power, the macro facility can be very complex. Needless to say, for both our sakes we're not going to delve into the most advanced aspects of macro systems.

When the assembler encounters the MACRO pseudo-op during its first pass through the program source code, it stores the text it finds after that into its symbol table area, until it finds an ENDM or EXITM pseudo-op. Then, whenever it encounters the macro name in the opcode field, it replaces it with the text in the symbol table. This process is called macro expansion.

For example, we frequently need to save all registers on the stack before calling a subroutine, and it is tempting to try to write a subroutine that will perform this task. However, note that this subroutine will push registers onto the stack and then try to return to an address given by the last register pair to be pushed, so it's not as easy as it first looks (though a solution is possible using the XTHL instruction). It's easier to use a pair of macros for the job.

```
PUSHAL  MACRO
        PUSH    PSW
        PUSH    B
        PUSH    D
        PUSH    H
        ENDM

POPALL  MACRO
        POP     H
        POP     D
        POP     B
        POP     PSW
        ENDM
```

Including these macros in-line where required will do the job.

Another frequent requirement is to use the CP/M BDOS functions to perform tasks such as sending characters or strings to the console, or reading and writing files. As you will recall, this is done by loading the D or DE registers with the data to be output, and the C register with the function number, then calling location 5.

We can use macros to remove much of the tedium of setting up registers, saving prior contents and so on. The simplest way to do this is to create a set of macros, one for each BDOS call. For example, here's a pair of macros to input and output characters through the accumulator:

```
BDOS    EQU     5

CONRD   MACRO
        PUSH    H
        PUSH    D
        PUSH    B
        MVI     C,1
        CALL    BDOS
        POP     B
        POP     D
        POP     H
        ENDM

CONWR   MACRO
        PUSH    H
        PUSH    D
        PUSH    B
        MVI     C,2
        MOV     E,A
        CALL    BDOS
        POP     B
        POP     D
        POP     H
        ENDM
```

Another technique is to use a general BDOS call macro, but the problem here is that different kinds of parameters are used. On some calls (the ones for character I/O to the console and peripherals) a single character is output at a time, while for the disk functions, the parameter passed to the BDOS is generally an address in DE. The solution is to have several different sets of macros; macros for each of the I/O functions and a general macro for disk BDOS functions:

```
RETVERS EQU     12
RESDSK  EQU     13
SELDSK  EQU     14
OPEN    EQU     15
CLOSE   EQU     16
          .
        (etc)
          .

DBDOS   MACRO   FUNC, PARAM
        IF      NOT NUL PARAM
        LXI     D,PARAM
        ENDIF
        MVI     C,FUNC
        CALL    BDOS
        ENDM
```

In this case, I have used the NUL function of MAC to test whether a parameter has been passed to the macro. For example, function 12, get version number, takes no parameters. Therefore, a call to the BDOS to get the CP/M version number would be written

```
DBDOS   RETVERS
```

while the select disk function (14) requires the disk number (A = 0, B = 1, etc) to be placed in E, so it would be written

```
DBDOS   SELDSK,1
```

A more complex case is the printing of a string. Here, we can use the BDOS print string function to get the work done. A simple case is when we want to print an error message.

```
ACR     EQU     13
ALF     EQU     10
BDOS    EQU     5
```

▶

REVELA

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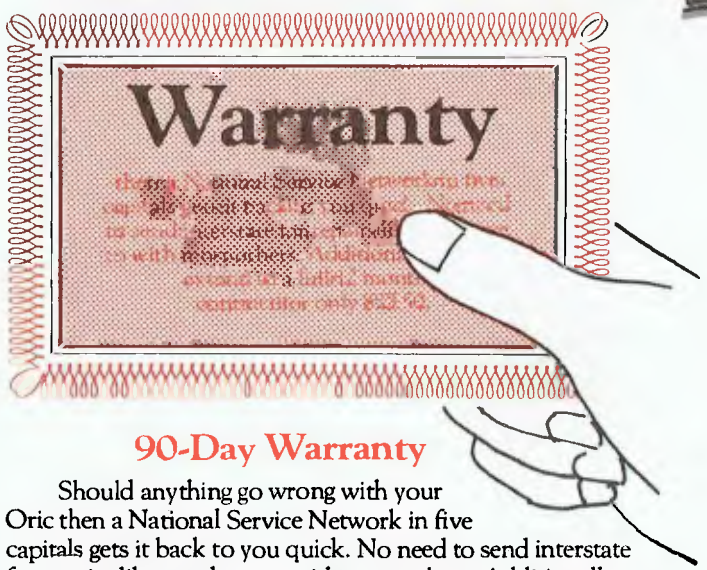

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ORIC-1

```
PRINT   MACRO   MESSAGE
        LOCAL   ?OVER,?MSG
        JMP     ?OVER

?MSG    DB      MESSAGE
        DB      ACR,ALF
        DB      '$'

?OVER   LXI     D,?MSG
        MVI     C,9
        CALL    BDOS
        ENDM
```

This example introduces a couple of complexities. Note first, that the generated code must include the text of the message, so it must include a jump to get around the text. We can't simply come up with a label for the purpose, as the next time the macro is invoked in the program the assembler will tell us we've already used the label.

Instead, we define a couple of local labels, ?OVER and ?MSG: one to be the target of the jump over the text, and the other to be the address of the text itself. When the macro is expanded, the assembler will supply its own labels, allowing the macro to be re-used elsewhere, as this listing shows:

```
000D =          ACR     EQU     13
000A =          ALF     EQU     10
0005 =          BDOS    EQU     5

                PRINT   MACRO   MESSAGE
                        LOCAL   ?OVER,?MSG
                        JMP     ?OVER
                ?MSG    DB      MESSAGE
                        DB      ACR,ALF
                        DB      '$'
                ?OVER   LXI     D,?MSG
                        MVI     C,9
                        CALL    BDOS
                        ENDM

                        print   'Now is the time'
0000+C31500             JMP     ??0001
0003+4E6F772069??0002   DB      'Now is the time'
0012+0D0A               DB      ACR,ALF
0014+24                 DB      '$'
0015+110300     ??0001  LXI     D,??0002
0018+0E09               MVI     C,9
001A+CD0500             CALL    BDOS
001D C30000             jmp     0

0020                    end
```

The labels ?OVER and ?MSG are replaced by ??0001 and ??0002 respectively. As the assembler encounters more local labels, it will generate more labels of that kind.

There is still another problem with macros of this kind – they generate in-line code each time they are invoked. This means that large chunks of code are repeated in each macro, when they could be more efficiently used as subroutines. Is there a way of turning macros into subroutines? The answer is, obviously, yes – otherwise I wouldn't have mentioned it!

As a macro is expanded, the assembler follows the normal sequence of events: placing op-codes into the source text and assembling them, and executing pseudo-ops. These pseudo-ops include macro definition statements, like MACRO and ENDM. Because of this serendipitous operation, we can use macros to redefine themselves.

It works like this. The first time a macro is expanded, we turn it into a subroutine, a jump past that subroutine, and a call to the subroutine. Once the subroutine is in the program, we can simply call it, so we redefine the macro as a simple subroutine call. For example, consider the in-line print subroutine we used in the monitor program some time ago. That could be replaced by a macro in a macro library. Here's the code:

```
;Inline print macro
;  print chars ending in 0 pted to by return address; return to byte after

;
print   macro   str
        local   over
        jmp     over    ;; jump over in-line subroutine

ilprt1: xthl            ; get ptr and save hl
;
ilplp:
        mov     a,m     ; get char
        ora     a       ; reached end
        jz      ilplx   ; yes, exit
        call    cout    ; print char
        inx     h       ; point to next
        jmp     ilplp   ; and go round

ilplx:  inx     h       ; pt to byte after ending 0
        xthl            ; restore hl and ret
        ret
;
over:
print   macro   ?s      ;; redefinition
        call    ilprt1
        db      ?s
        db      0
        endm

        print   str
        endm
```

Here's how it works: first we define the local variable over and insert a jump to it. This jumps around the subroutine. Then comes the in-line print subroutine itself. Once the subroutine has safely been incorporated in the generated code, we then redefine the macro as a call to the subroutine. Finally, before finishing the original macro expansion, we insert an invocation of the new macro – in other words, a subroutine call to ilprt1.

Defining macros in this way makes it possible to have libraries of macros and simply stick them into a program by name; the first time the assembler encounters the macro, it sticks in the appropriate subroutine, but thereafter it only generates subroutine calls.

It's fair to say that macro substitution, using these kinds of tricks, can be pretty mind-boggling, so if you're still with us, well done! However, bear in mind that there is a lot more to the use of macros than this, especially when you start to delve into recursive macro expansions and other *recherché* stuff.

The construction of macro libraries, as discussed above, is very easy – at least it is with MAC and RMAC. Simply collect all your macros into a text file, and call it MACROS.LIB or similar. Then, at the top of your program, insert the line MACLIB MACROS, and all your macro definitions will be dragged in, ready for use. For example, suppose I put the in-line print macro into a library of its own, called ILPRT.LIB. Here's a simple example which demonstrates how the MACLIB command works, and also proves that macro redefinition really does work:

```
        maclib  ilprt
bdos    equ     5

        print   'Now is the time '
        print   'for all good men'
        jmp     0

cout:   push    h
        mov     e,a
        mvi     c,2
        call    bdos
        pop     h
        ret
        end
```

Here's the PRN file which shows how it works:

```
                        maclib  ilprt
0005 =          bdos    equ     5

                        print   'Now is the time '
0000+C31300             JMP     ??0001
0003+E3         ILPRT1: XTHL            ; GET PTR AND SAVE HL
0004+7E                 MOV     A,M     ; GET CHAR
0005+B7                 ORA     A       ; REACHED END
0006+CA1000             JZ      ILPLX   ; YES, EXIT
0009+CD3E00             CALL    COUT    ; PRINT CHAR
000C+23                 INX     H       ; POINT TO NEXT
000D+C30400             JMP     ILPLP   ; AND GO ROUND
0010+23         ILPLX:  INX     H       ; PT TO BYTE AFTER ENDING 0
0011+E3                 XTHL            ; RESTORE HL AND RET
0012+C9                 RET
0013+CD0300             CALL    ILPRT1
0016+4E6F772069         DB      'Now is the time '
0026+00                 DB      0
                        print   'for all good men'
0027+CD0300             CALL    ILPRT1
002A+666F722061         DB      'for all good men'
003A+00                 DB      0
003B C30000             jmp     0

003E E5         cout:   push    h
003F 5F                 mov     e,a
0040 0E02               mvi     c,2
0042 CD0500             call    bdos
0045 E1                 pop     h
0046 C9                 ret
0047                    end
```

The art of writing macros using redefinition and other tricks is not exactly dying out, but it's under a lot of pressure from a simpler alternative: relocating assemblers and linking loaders. I'll discuss them in the next article. ❑

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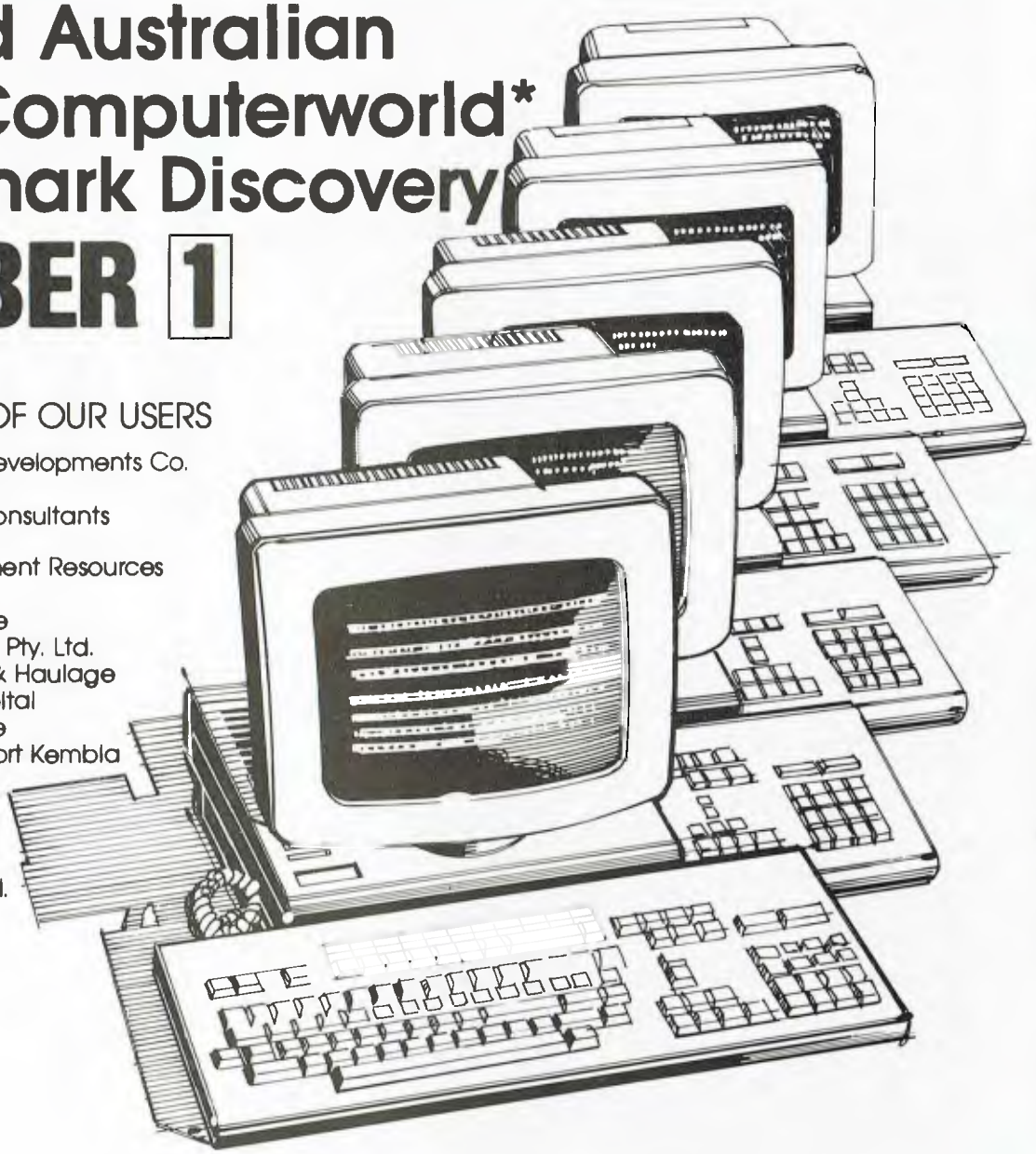

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your MICROBEE computer

By Mike Newnham

HELLO once again. This month, some more useful hints, but first a few thoughts on software quality. I've had a reasonable amount of material to look at over the past few months, and will be reviewing it in future issues. All this software has been written with intent to sell, and most of it is of reasonable to high standard. As for the rest ... a few words come to mind, but the most appropriate is 'dull'.

If you are writing software for sale then you have a responsibility to ensure that your product meets certain standards. It is not possible to spend a few hours at the keyboard and expect the results to make you rich, unless of course you're some sort of prodigy.

The programs, in this instance, are mainly game programs. Now, a game should be entertaining, and most achieve this by either testing hand/eye co-ordination or by challenging the intellect. Frankly, some of the stuff I've seen is about as entertaining as watching concrete set.

If the game is played in real-time, then action is the chief means of holding a player's interest, and action means moving graphic images, especially in the conflict-type games.

Designing realistic graphics can be the most tedious part of program creation, but patience and an imaginative approach will pay off in the long run. I have seen graphics that leave me envious of their creator's imagination, and some that lie on the bottom of the screen in perfect imitation of wet bread.

The smoothness of the motion of an image across the screen is another important factor. Flickering, jittery graphics will soon compel even the most inveterate games player to flee the keyboard in search of aspirin. Most screen movements have to be slowed with delay loops to make them more than just a blur, and careful pruning of the delay values used in these loops will result in very fluid motion.

One problem with screen working is the annoying screen conflict which occurs when the processor writes to screen memory. This conflict is observable as black lines through your pretty pictures. In most cases, this can be avoided. If your game is written in machine code the following routine can often be used to make the processor wait until the screen is not actually being refreshed before it writes to screen RAM.

```
                LD A,(0E0H)
                BIT 5,A
                JR Z,WAIT
                RET             ; if used as subroutine.
```

It will provide about 400 microseconds of writing time and can be used in two ways. The first is as a subroutine which is called immediately before the instructions which will alter the contents of screen memory. The second method is to place the complete routine, without the RET, before these same screen-modifying instructions. It will slow things down a bit, but in most cases speed can be regained by cutting down the size of delay values.

Where the game relies on text for player interaction, there are also a number of points to observe. If your text is selected for display in random fashion, try to eliminate constant repetition of a particular phase of events. Trying an adventure game recently, I yawned my way through eight lifeless scenarios before some unannounced nasty put an end to my misery. Boredom kills software sales. One other thing: there is no excuse for spelling errors, since dictionaries are not expensive.

Imagination and originality are essential for good results. Look at it this way: we don't really need twenty-six versions of the one program. Space Invaders suffered heavily in this respect, I believe.

The quality of your software is, ultimately, a function of your attitude towards it. Think about a program before you write it. Make notes to develop your ideas and be patient enough to try different techniques to achieve the same result. That tried and true routine might work more efficiently if rewritten.

If an individual believes he has been 'ripped off', and there are a few who have been, then you will have a hard time selling him anything else. He will also warn his colleagues. Enough said.

Poker Machine

Okay, you addicts, here's the chance to feed the habit without going broke in the process. Computer Techniques is offering quite a good four-reel poker machine program that doesn't always clean you out. Oh, you can do your dough, so to speak, but you also stand a reasonable chance of coming out in front.

The program uses sound to good effect, and the high-resolution graphics are very good. They are also written for colour, if you have the hardware. Poker Machine is its name, and it sells for $15.95.

Ashes To Ashes

Met a fellow, late last year, who used a modified TV set for a VDU. One night, he and a friend decided to hook their Microbees together so they could talk to each other. At the moment of switch-on, however, the first Microbee cashed in its chips (heh heh). You see, the modified TV was of the live chassis variety. In this type of set, the neutral is connected directly to the chassis of the set and the active disappears into a voltage dropping and rectification network. There is no power transformer to isolate the set from the mains. If the active and neutral are somehow swapped about, then you have a potentially lethal situation on your hands, both for you and your computer. Therefore, if you elect to use a television set as a monitor, avoid the live chassis types like the plague.

Mytek Word Processing

From Queensland, a couple of tips not mentioned in the Mytek manual. Peter Bisset writes:

"When using macro commands, it is necessary to terminate each line of instructions with a RETURN, even if only one line of commands is used. If you wish to check up on what is in the macro buffer, then typing MO (in control mode) will print out the contents of the buffer, similar to the G command for the Hold Buffer.

"Secondly, one must take care when using long words at the end of a line. If the final word on a line contains more than fifteen letters, then the word will not be moved down to the next line. Instead, it will simply continue on to the next line. Although words longer than fifteen characters might not be used frequently a word followed by a punctuation mark and another word can easily amount to more than the limit. This can be avoided by using spaces in the correct places, such as after a full stop, comma, colon, and so on."

Thanks for the hints, Peter. ▶

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Disk Controller

No doubt we would all like to add a disk drive to our Bee, but for many the cost of the upgrade is prohibitive. Well, you can now reduce the initial outlay substantially. If you don't really need CP/M and you only have a 16K or 32K machine, then perhaps you should take a close look at Dreamcards' most recent piece of sorcery. The Dreamdisk controller (*Your Computer*, January '84, page 107) is available separately for $299, with one double-sided, double-density drive for $699 and with dual drives for $999. This provides high-speed mass storage at a reasonable price.

The Dreamdisk controller is supplied with two ROMs. One contains a disk operating system for use if you don't want CP/M, and the other is a BIOS ROM which is necessary if you plan to implement CP/M at a later date. The controller plugs directly into the expansion interface of any 16, 32 or 64K Microbee, and is definitely worth consideration as an alternative disk drive system.

ASCII To Binary Conversion

This month's routine is designed to convert decimal integers, not greater than 65535, into binary in the HL register pair. The integer for conversion is to be picked up from the ASCII buffer, having been placed there by the line input routine described last month.

First the conversion routine itself, and then some instructions to execute and test it.

```
0100 ASBIN    LD BC,0         ;initialise
0110          LD HL,0         ;working registers.
0120          LD DE,ASBIN     ;point to ascii buffer
0130 BINHL    LD A,(DE)       ;get a digit
0140          CP 0DH          ; CR., see if done
0150          RET Z           ; return if so
0160          AND 0FH         ;mask off unwanted bits
0170          LD C,A          ;prepare for addition
0180          CALL HL10       ;multiply HL by 10
0190          ADD HL,BC       ;add in new digit
0200          INC DE          ;point next
0210          JR BINHL        ;and get it
0220 HL10     PUSH DE         ;save pointer
0230          ADD HL,HL       ;HL * 2
0240          LD D,H
0250          LD E,L          ;save it
0260          ADD HL,HL       ;HL * 4
0270          ADD HL,HL       ;HL * 8
0280          ADD HL,DE       ;plus HL * 2 = HL * 10
0290          POP DE          ;retrieve pointer
0300          RET             ;back
```

The routine does not need to know how many digits were entered into the buffer, since the conversion process takes care of this. To keep the routine easy to follow, I have not included any error testing. ASBIN assumes that you have entered a string of ASCII digits which represent a decimal number not greater than 65535.

Each time a digit is picked up from the buffer, and before it is converted to binary and added to HL, the contents of HL are multiplied by ten. This performs the same function as shifting a digit left in decimal arithmetic. The digit from the buffer is then added to HL and the routine loops back to the start. When a CR (0DH) is encountered, the conversion is complete and the routine returns with the binary result in HL.

To test it is simple enough. First, type in the following code, followed by the line input routine, and then ASBIN. ORG it as 400H and assemble it.

```
TEST    LD A,12
        CALL 33CCH      ; clear screen
        CALL LINEIN     ; get ascii digit string
        CALL ASBIN      ; convert to binary
        LD DE,2F0FH     ; middle of top screen line
        CALL 0DCB8H     ; display HL
        RET
```

Go to 400H, enter the number for conversion followed by a CR, and the result will be displayed on the screen.

The CALL 0DCB8H is a call to a routine in the EDASM ROMs and is used to take the contents of HL and display them at the location pointed to by DE.

That's all, folks. See you next month.

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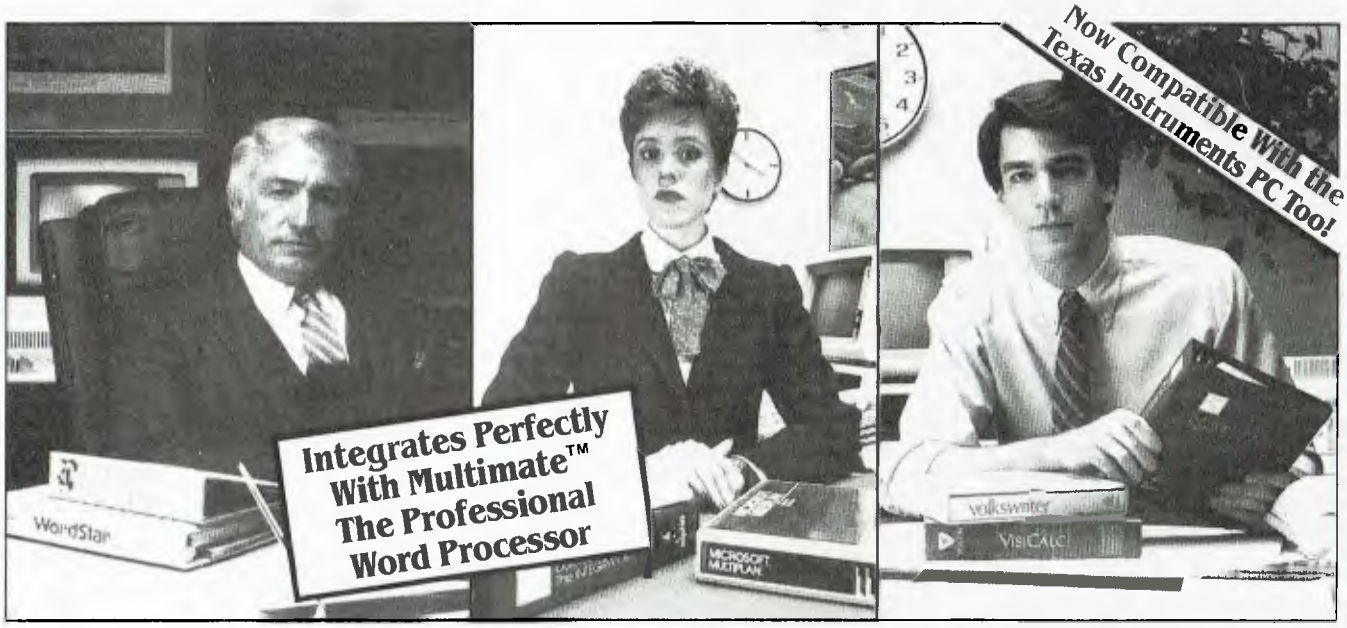

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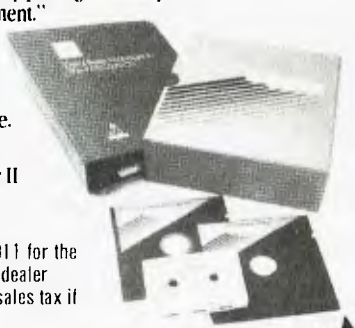

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your TRS80 computer

By Rod Stevenson

IT APPEARS that as I was writing my piece about back-ups for the March issue, so was the editor of the Tandy newsletter; for there is a very good article on this subject in the December/January issue, which I recommend you read. It is written at a slightly higher level than this column and delves into father/son/grandfather systems. While it is obviously aimed at the business user, I feel it would be of use for the hobbyist, too.

I understand the Tandy policy for newsletter mailing is to send to all who have bought a computer from them, and to anyone who applies with a Tandy serial number. So, if you're one of the unfortunates not included on the circulation list, perhaps you can go to your local Tandy Computer Centre and ask for a photocopy of the relevant issue.

Advanced BASIC

I've been asked to recommend some aids or textbooks for extending competence in advanced BASIC, with particular reference (of course) to the TRS version of Microsoft Level 2 and Disk BASIC. After investigating the available resources I came to the conclusion that there isn't anything I'd recommend. There are courses at the various Colleges of Advanced Education, but these are not machine-specific. There are also books on what is referred to as advanced BASIC, but I consider them to be far from advanced. The one exception is the IJG volume *BASIC Faster and Better*, but I found it more than a little 'fussy'. It may, however, get you thinking along different lines from those you've been used to.

This lack of structured teaching facilities leaves self-education with the aid of the TRS-specific magazines such as *80micro* and *Basic Computing*.

Most local user groups don't appear to offer structured courses either. The experiences of our own group indicate that this is because of the variety of areas within what might be called advanced BASIC: people tend to pursue the track of interest most relevant to them.

An appreciation of machine language is very handy for improving your knowledge of advanced BASIC. You don't have to be able to construct masterpieces in assembly language, but the ability to patch small machine code routines into your BASIC masterpiece, for either faster operation or to modify the BASIC interpreter itself, is useful. A proper study of the whole area of assembly language (as detailed in my February column) is probably the best way to go, but, for the impatient, a shortcut can be taken by reading Hardin Brothers' column in *80micro*.

If you have definite jobs to be done, there is probably an applications package to suit. With a word processor, a database and a spreadsheet program, one can achieve much in the area of 'serious applications' – and without having to learn BASIC at all, since most of these packages have their own 'language'.

M/L Routines Into BASIC

Yes, I'm aware there are a number of complex routines available to automatically convert your machine code program into BASIC data statements, for loading from the one program instead of having two loads (a good idea). However, I've found that the effort of learning how to use them, and understanding what is going on, takes longer than simply typing in the decimal values. I just PRINT PEEK the addresses on the screen (which gives them in decimal) and type the values displayed into a data line manually, having previously loaded the machine code program into memory.

Then there's the question of how to get the data into memory from BASIC, and how to access the routine from BASIC. Having the values in a data statement seems to suggest a FOR NEXT loop to READ, but then what to do with the data that's been read? The simplest method is to POKE it into a memory address which has previously been protected by answering the MEM SIZE? question. The disadvantage with this is that it won't allow relocation into a machine of different memory capacity, nor will it allow the use of anything else at the top of memory, if it hasn't been allowed for in writing the BASIC code. The advantage is you'll always know exactly where your routine is, and can access it with a simple USR(0) call.

Having pointed out the disadvantages, I'll now disappoint you by not detailing the alternative methods, some of which I've mentioned in earlier columns and some of which have appeared in the abovementioned specialist TRS magazines. As a last resort you can always write to me for details.

There are also two methods of keeping such a routine in a string. The first is simply to define A$ (for example) in an early line of your program, then use VARPTR to find out where A$ is living in memory and POKE in the data. The other way is to build A$ (again only an example) by a line such as A$ = A$ + CHR$ (data). The first technique will always locate A$ within your BASIC listing space and therefore precludes certain values (0H, 80H, 58H) because BASIC will take them as end of line delimiters. It does mean you can delete the line that builds the string before you save the program – this is why some programs appear to contain 'garbage' when listed, but still run properly.

Another technique very similar to the first string method is to store your code in a dummy REM statement, usually near the beginning of the BASIC program so it's easy to find. This limits the use of certain values, but it also allows you to delete the creation line before saving. If you do delete the line, the program becomes position specific, so you might then put it in high memory.

Hexadecimal Terror

Why talk Hex? Contrary to the beginner's belief, it's not just jargon. While I can't give a plausible reason here, I can say that when the time comes in one's attainment of expertise and knowledge of computing, learning Hex becomes the obvious thing to do.

The conversion is simple enough. The basis of understanding really lies in comprehending how our decimal system works. Most of us have grown up with it, so anything else is considered odd. Instead of nine being the last number in the 'units' column, as in decimal, 15 is the last in hexadecimal; except that to avoid the confusion of having double digits to represent one unitary value, the letters A to F are used. So the hexadecimal range goes from zero to nine, then A to F. F represents 15decimal, and 10hexadecimal represents 16decimal. To distinguish between the two, hexadecimal is followed by H while decimal is without any suffix. Calculation requires the same process as with decimal. Just as 1469 really means (1 X 10 X 10 X 10) + (4 X 10 X 10) + (6 X 10) + (9 X 1), so 37E8H really means (3 X 16 X 16 X 16) + (7 X 16 X 16) + (14 X 16) + (8 X 1).

You'll note that most books appear to be bilingual in decimal and hex, and the memory map in the manual gives both. But in reality, you'll find that the appropriate base is used for individual applications.

The BASIC Interpreter

Even when jumping around between machine language and BASIC, there's really no need to delve into the interpreter that is looking after the running of ▶

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BASIC. As long as you observe all the points (and there aren't many) warned of in the BASIC manual, there should be no problem. One in particular, which can often be forgotten, is that the call to the machine code routine by USR(0) should be a separate line. Even though it may be in a multi-statement line, forgetting the rule is likely to cause grief at some time. The more adventurous will find (with the assistance of some version of a ROM manual) there are other ways to jump into the routine, but the same rule applies.

The BASIC interpreter handles one line of BASIC code at a time. If you keep this in mind, the reason for the above warning becomes apparent. So too does the possibility for changing the size of protected memory from within the running program by manipulating the pointers, as well as a number of other less conventional things.

Slow Down

In my discussion in February on learning assembly language, I neglected to warn against trying to go too fast and not achieving a proper grounding in the elementaries.

I received a letter complaining that Barden's *TRS-80 Assembly Language Programming* uses a routine to print a figure 1 on the screen, when the same can be done far less painfully in BASIC. Of course it can. That exercise and others like it are elementary and are included just to show how assembly language works. When you've got the idea of printing the solitary 1, it won't be long before you can fill the screen with 1s, and that is far quicker with Assembly than BASIC. So stick with it. It will all come, but not in one night's bedtime reading!

Memory Tables

There are various tables that give the start-end-entry addresses for common popular programs, to enable them to be transferred onto stringy floppy wafer or onto disk. But, of course, they can't possibly include all the programs we'd like to see included, and there isn't really any need for them to do so. My favourite monitor programs, Mon3 (for tape) and Mon5 (for disk), will provide this information just from the loading of the tape program.

Of course, the Mons have many many more attributes. If you're at the level of requiring such information, you probably want to do the other things they are capable of anyway. Although from Howe Software in America, they are also in the Molymerx range distributed by Micro 80 in Adelaide.

Your Local User Group

I know I must appear to hammer this point to boredom, but it's only because I consider any hobbyist who doesn't belong to a user group is missing out on a great deal. The fact is, the more you contribute to anything, the more you'll gain.

An outstanding example is found in the pleas this magazine receives for help with solving adventure programs. To give the step by step answer will only destroy the game for untold numbers of readers. Most user groups will have at least a small sub-group of adventurers. You can gain a lot by talking to them, even if you've solved Deathmaze without help. You'll find out the reason for the delay of the release of Asylum2. You may even enjoy helping others get the way of thinking necessary to solve those games which you have already mastered.

After reading the newsletters our group gets from other groups, I see that most have discount deals on diskettes. The consistent price of $35 for Verbatim SSDD indicates there is co-ordination between distributors in making the offer. So, if you're paying full price for diskettes at the moment, there's the price of your user group membership.

I've talked about buying direct from overseas before and, since I've had a letter from a local importer claiming his $70 profit in $200 is not excessive, I'll just point out that your local group can assist with advice from others who've bought direct.

Advice

You may hear conflicting views on how to treat a computer, and my advice may be as dubious as some of the other suggestions I've heard lately – but I'll let you judge for yourself.

I never switch on the power with the disks in the drives, and I switch on the CPU last. I consider the little extra effort is worth it, even if it takes me a year to avoid losing a disk I may otherwise have had.

I don't believe in using abrasive material to clean the heads of cassette recorders or disk drives. I use only a moistened cloth to clean the brown oxide from the pressure roller in my cassette recorder, and at the same time wipe over the head. It's still working after six years' fairly heavy use. I know others who've thought it necessary to do some 'fiddling' and caused problems they didn't even know were possible. So if it works, I say, leave it alone! ❑

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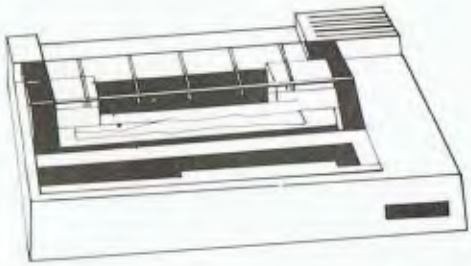

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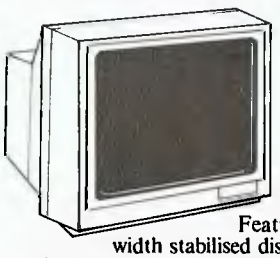

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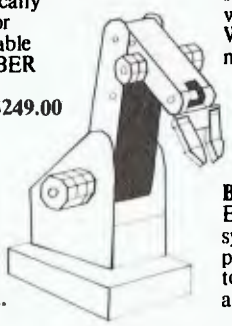

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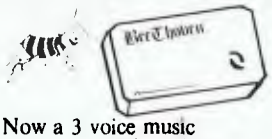

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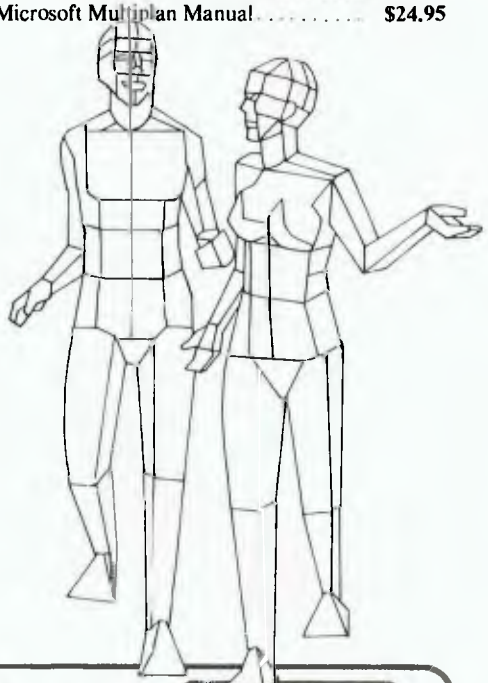

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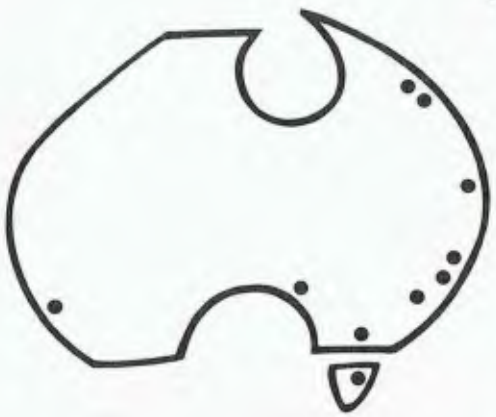

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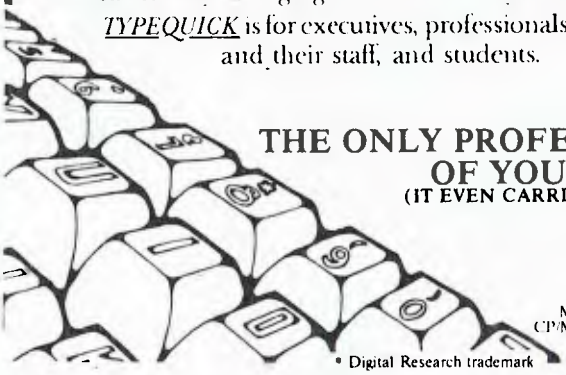

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your OSBORNE computer

By Geoff Cohen

WELCOME to the first of the new Osborne column. Because Steve Townsend has found himself with a greater workload after having changed jobs, he no longer has the time to write this column and has asked me to take over.

Those of you with good memories should remember my columns in this magazine (1982), on the OSI computers. A lot of water has passed under the bridge since then and I have been corrupted by CP/M – mostly on the Osborne, of course.

The Osborne And I

This first column is probably a good time to give a brief description of my association with Osborne (the company, the man and the computer).

In early 1982, I left my job of running an electronics department at the Australian National University, to work as a hardware consultant for a Canberra firm who were also agents for Osborne. Back in those days, the old sewing machine (whoops, I mean Osborne) was the only portable CP/M system available at a reasonable price.

In those days, before double-density and 80 columns, most reviews (including that of Les Bell in May 1982) included comments like "a good reliable computer, but it needs more disk capacity, and scrolling the 52-character screen in Wordstar is driving me crazy."

I agreed that 52 was not nearly enough characters across my screen; 64 should have been the minimum; 80 was acceptable; and 100 to 132 was excellent for spreadsheets, printing 96-character documents and so on. After several phone calls to the Osborne distributors in Sydney, I decided that holding my breath while waiting for the 80-column upgrade promised in the Osborne user's manual would not be a good idea.

To The Wiring Board

I had previously designed an upgrade for the old OSI Superboard (remember OSI?), which changed the screen from 24 to 64 characters per line. That Osborne, with a staff of 600, had not yet designed an 80-column VDU did not deter me. So, there I was one day with an old 64-character OSI VDU board, my Osborne spread all over the work bench, hundreds of wires everywhere, and finally, after many hours, a recognisable 64-character display on my 12-inch monitor. True, it wouldn't scroll vertically, but we did have more characters per line.

I finally got a prototype display board going well (with software written by Alan Vidler of AV Software). This was unveiled to the public at the 1982 MICSIG Computer Display in Canberra. The event went excellently, with local TV coverage and interest shown by every Osborne owner that saw it.

That was the turning point, and after several trips to Osborne Australia in Sydney, a member of the firm I was consulting for went over to OCC in Hayward, California. The result of some protracted negotiations was that OCC would pay the firm (not I, alas) $250,000 for the complete rights to this board, giving it the nice Australian codename, Koala.

The Wonderful World of Disney/Osborne

So there I was, travelling to California on 24 hours notice. After finding the Osborne factory, remembering not to drive on the right side of the road, I finally got to meet the famous Adam Osborne and Lee Felsenstein, who designed the Osborne. Lee really did a great job, but I wish he hadn't redesigned the disk drives with non-standard connections. It makes it very difficult to add disk drives. If there is enough interest, I can describe how we have added two slim-line 800K disk drives inside the Osborne to give 1.8 Megabytes total disk capacity, and also how to add external 20 cm drives.

Anyhow, we finally managed to get the prototype Screen Pac design to the final production stage, all relevant contracts were signed, OCC was the proud owner of the design, and I had seen Disneyland and the Golden Gate Bridge.

Before I left the US, I also went to COMDEX 1982 and demonstrated the Screen Pac at the Osborne stand. It was also a pretty good reason to go to Las Vegas (that's my excuse and I'm sticking to it). It's really an amazing place (COMDEX), and it sounds like COMDEX 83 was even bigger.

Fix The Flicker

Well, that's about the whole story of the Screen Pac, except for this last point: in the middle of the Screen Pac production run, Osborne changed some components and they can occasionally cause flickering characters on the display. If any Osborne owner or dealer wants details on how to fix this (very simply), I can be contacted on (062) 547 608 from 8 am to 8 pm.

That's it for this column. I would appreciate any reader feedback, and hope to provide a useful clearing house for any Osborne items in Australia. Future items planned include details on all Osborne user groups, Screen Pac utilities, simple ways for starting new diskettes, speeding up Wordstar and fixing the 'Arrow Key' problem. Cheers for now. ❑

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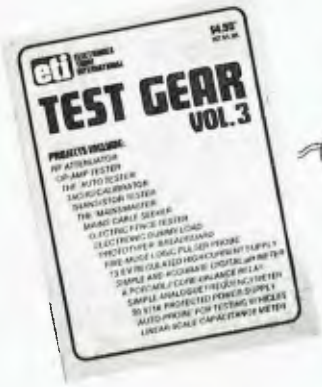

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VZ-200 Software: The author of 'Acne Attack - the game that set everyone laughing...', described in the October 8-9 1983 edition of the *Weekend Australian*, presents 'Snake Mambo'. 'Snake Mambo' is a dynamic chase game utilising excellent graphics and sound effects. Guide Mambo, the galactic snake, to various energy pills to help him regain his strength and your score. Mambo needs help and only you can save him! Program uses joystick or keyboard. Computer verified tape with full instructions, $10. Mail order to William Dickinson, 'Mount Pleasant', Bannockburn 3331. Prompt return guaranteed.

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Wanted: Chess for Apple II+, for under $30. S Darragh, 55 Dunrossil Street, Wembley Downs 6019. (09) 341 5103.

TRS-80: Help in Asylum II, Picknicker, Rats and how to fix trnsporter. Write Nick Lambropoulos, Box 440, Mildura 3500. Please!

NEC Colour APC: 2 x 1M drives, 256K, 8086. Hi-res graphics sub-system and development software. Various highly useful disks. Warranty until end June. $6900 ono. M. Mowbray. (02) 923 2974 ah, (02) 230 5438 bh.

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Apple Software: Send a list of yours to arrange swapping around Sydney. Stephen Cheung, 60 Spencer Road, Killara 2071.

TRS-80: Model III with two disk drives, 48K, TRSDOS and manuals. In excellent condition, 1 year old, hardly used. Cost $3000, sell $2000. (03) 729 5541 ah.

Kaypro User's Group of WA: Meetings are held at 7.30 pm on second and fourth Mondays in the month in the canteen of the Department of Agriculture, Jarrah Road, South Perth. Meetings on the second Monday of the month consist of a brief business meeting followed by a Question and Answer session; the meetings on the fourth Monday consists of workshop sessions on the various aspects of the Kaypro. Phone enquiries (09) 384 5511.

Apple: Diversi DOS, increases I/0 four times. About half retail. For information write P. Johnson, 50 Bayswater Road, Moonah, Tasmania 7009.

For Sale: Complete, one Model 15 Teleprinter, one Model 14TT (teletype reperforated) and one tape reader teletype 14TD, partially built demodulator, paper, tape, the lot $280 ono. Phone (02) 525 2018.

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System 80 MK2: 6 months old including monitor, books, programs etc. Worth over $950, sell $400 ono. Phone (02) 651 1852 (after 4 pm).

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Commodore 64: Disk drive, 1526 printer, box disks, paper, $370 of software, worth $2100, sell $1750. Phone James (076) 34 3547.

OSI C49 Challenger: 32K RAM (expandable), MPI B52 disk drive. $400 worth or software. All for $900 ono. Phone (08) 390 3192.

BigBoard2 Chess Programs: Sargon derivative using BB2 graphics on 8" CP/M disk. D Craig, 2 Brindle Street, Mansfield 4122. Phone (07) 349 9719 ah.

Microbee Software: Matrix package. Includes three programs – inversion, determinant and multiplication. The lot for $17.50 (includes postage). Write to: 'Software Offer', 7 Gibb Street, North Ryde 2113. Prompt despatch assured.

Wanted: ZX80 to buy or swap. Phone (02) 668 9616, ask for Wayne.

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TRS-80 I/III: Thingdex – a program to let you create an index or catalogue of anything (e.g. mailing lists). Requires NEWDOS/80.V2 and 48K. Documentation and listing $6.00, tape $9.00 or disk $15.00. CMF Computing Services, 36 Ambalindum Street, Hawker 2614.

Apple Software: Will buy or swap games, adventures etc. Send list to Jeff Davidson, P.O. Box 521, Frankston 3199.

For Sale: Sharp PC1500 plus colour printer/plotter, programs and manual. As new $395.00, phone John (062) 71 9169 bh.

For Sale: Vista 200 double disk drive for Sorcerer plugs directly into expansion outlet. One-third new price – $499, with 30 diskettes. Heaps of software. Phone (02) 638 6966 or ah (045) 75 1651. G Berry.

CPM Users' Group: Disks up to no. 95 inc. Businessmaster II. Catalogue $8, 8" SSSD disks $9, Microbee $10, other formats available. $1 p&p per order. R.B. Archer and Assoc, P.O. Box 696, Ringwood 3134.

TRS-80 III: Wanted are some hints on Zork and Raaka-Tu. Write to J Quintner, 39 Mayfair St, Mt. Claremont 6010.

VIC-20 + Datasette: $200. Perfect working condition. Also many games, cartridges, books for sale at half-price. Davis, 8 Connelly Ave, Wagga Wagga 2650. Phone (069) 21 3874.

Wanted: ZX81 printer, RS232 interface, cassettes, word processor, toolkit, Forth, high resolution, etc. 25 Corunna Ave, Colonel Light Gardens. (08) 277 2152.

Printer: Daisywheel, Brother HR-1 parallel interface with tractor feed and paper. Excellent condition. Two boxes of paper included. $1050. Phone (02) 858 1644, 9am – 3pm.

WA ZX Users' Group: Meets in Perth monthly. ZX and Spectrum owners call (09) 335 1671 for information.

G-Pascal Compiler: For sale, for disk-based Commodore 64. Still under warranty. $50. Phone (03) 749 5706.

TC-80A Microcomputers: 64K with numeric keypad, 6502 & Z80 processor – $750. Disk drives, $350 – etc. Kim, P.O. Box 145, Mulgrave 3170.

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Microbee: 32K, GP80 printer, conv. TV/Mon, $100 of software, $800 ono. Phone (09) 339 5203.

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Continued on page 143

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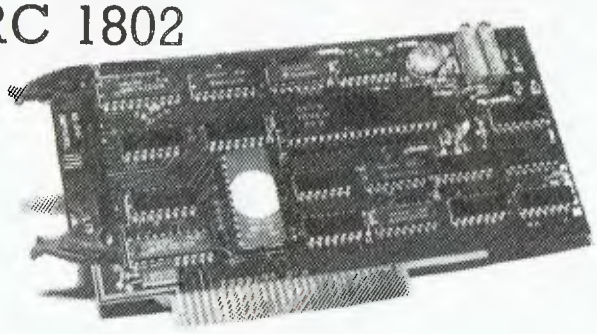

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From page 140

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Help: Urgent solution required to adventure game 'Golden Baton' on Commodore 64. Divorce imminent. Phone Iain (03) 221 5398.

Wanted: Information on System 80, software, anything else of interest. Contact Mr R. Schatz, P.O. Box 17, Koorawatha 2807.

For Sale: Two Epson Printers, 1 x MX80 FT, 1 x MX80 FT III, $750 each, both have parallel/serial interface. Also two Concorde V22 modems, full instruction booklet, no power supp. $850 each. Phone (02) 29 4065 bh, 84 7532 ah.

System 80: Blue label, 16K RAM, green phosphor monitor, games cassettes, dust covers, all manuals, $600. Phone Colin (03) 570 1462.

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COMX35: Please send a 30c stamp to Jeffrey for programs catalogue. GPO Box 456, Sydney 2001.

Adler SE1010: High-quality daisywheel typewriter/printer with Centronics interface. Ideal word processing printer. $1000. Phone (062) 41 6822.

Microbee: EPROM Programmer, new kit, complete, not built, gold wire wrap EPROM socket, $35. Jim (02) 525-2018.

Microbee Software: 'Golf', 'Lunar Lander' and lightpen programs. Send stamped SAE for catalogue. Chris Dalitz, 12 Paperbark Close, Wyoming 2250.

VIC-20: Computer games and utilities $2 per program, cheaper for bulk. Send SAE for a complete list, Chris Groenhout, 25 Kerferd St, Watson 2602.

ACT VIC-20 Bi-monthly Magazine: Many interesting articles and programs. April issue $2.00. Bi-monthly $12.00 per year. Chris Groenhout, 25 Kerferd St, Watson 2602.

Printer: Tandy DMP100 with extra ribbon, paper (RS-232 cable suit Microbee). $450.00 ono. Telephone (047) 53-6690 after 5 pm.

Microbee Software: Adventure game suitable for 16K. Instructions, tape, postage, $18. Mail order to Mr R Cotton, 26 Wananda Road, Narara 2250.

Continued on page 160

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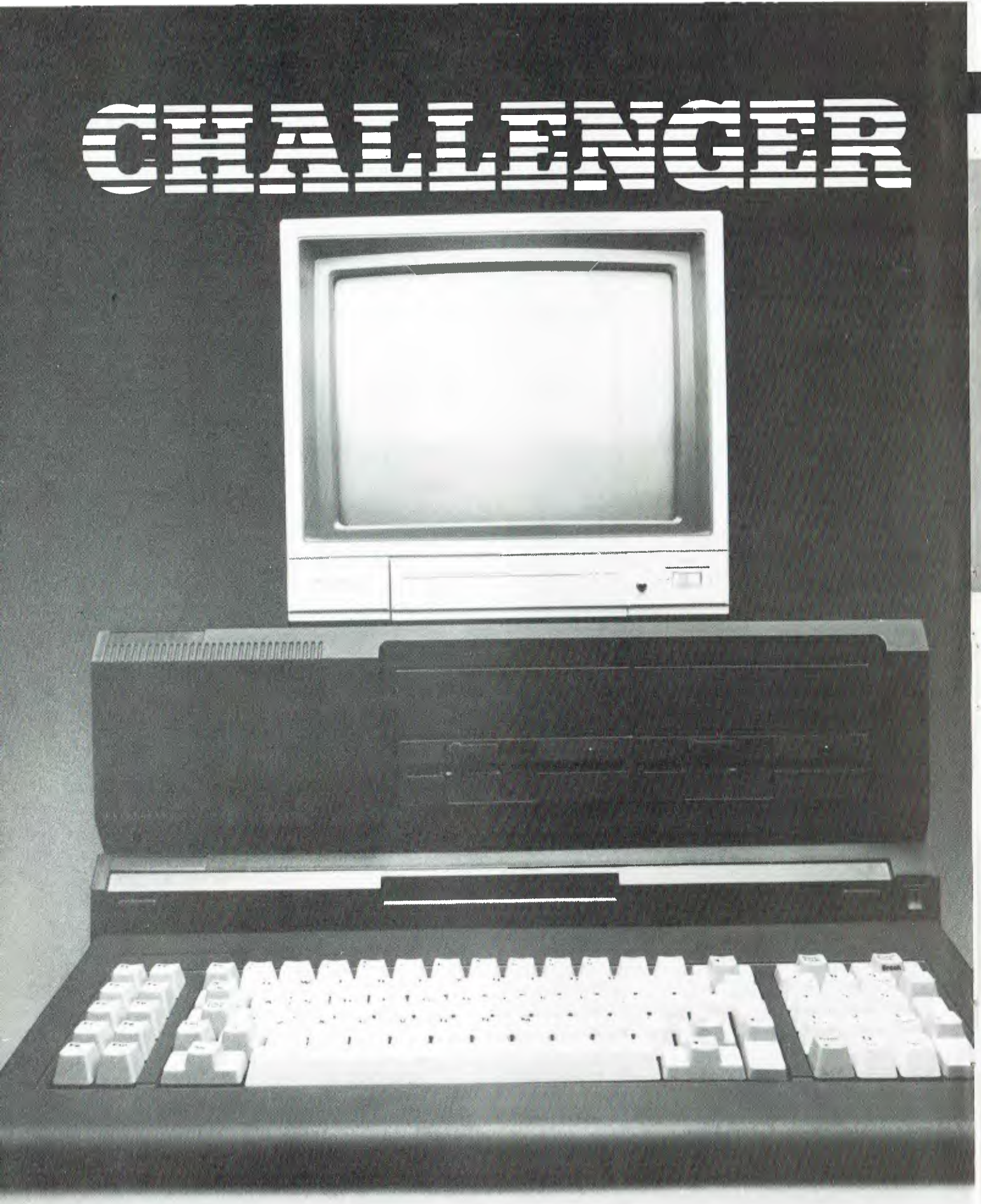

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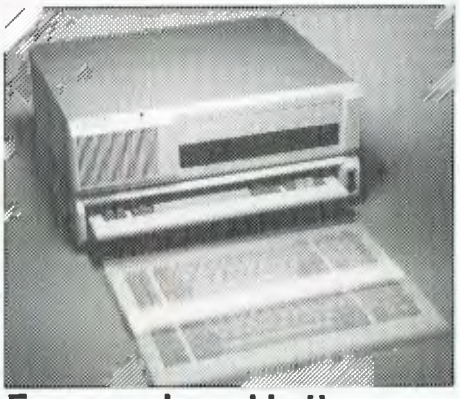

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A726

By Jeff Richards

THE KAYPRO parallel port is designed to drive a printer with a standard Centronics-style interface. Not all printers will necessarily work without trouble, however, and some additional information about the port may be helpful.

The Centronics standard interface is widely used for printer interfacing, and most devices stick closely to the standard. It is based on an 8-bit data word and at least two control signals – BUSY and STROBE*. BUSY is controlled by the printer and is read by the CPU, while STROBE* is controlled by the CPU and read by the printer.

When the CPU is ready to send some data to the interface, it looks at the BUSY signal to see if the printer is ready to receive the data. As soon as the printer is not busy, it drops the BUSY line. The CPU detects this, sends the data to the port and pulses the STROBE* line. The printer treats this as an instruction to read the data from the interface. The printer raises the BUSY line while it is digesting the data, and when it is ready it drops BUSY again, ready for the next character.

(Note that I have used the convention that a signal name suffix of '*' indicates a signal that is active low. Thus, 'STROBE*' indicates the signal that is usually at a high level, but which is pulsed low to show the data is available.)

Some devices use ACK* instead of BUSY. This functions in a similar manner, except that it is a brief low-level pulse to indicate that the printer is ready, rather than the steady low logic level of BUSY. Most devices that use ACK* also use BUSY. The Kaypro does not monitor the ACK* input.

Additional Handshake Signals

In some printers, a number of additional handshake signals are maintained. These may indicate principal conditions, such as paper-out or a ribbon fault. If the CPU is monitoring these signals, it can give an intelligent message explaining why the printer has stopped, but the Kaypro does not look at any signals from the printer other than BUSY.

If used, these signals are usually on pins 12, 13 and 32 of the interface, and these are left unconnected on the Kaypro. If these error lines are used, then BUSY still responds to the error. So ignoring them means that the CPU will stop sending data to the printer, but it is unable to tell what caused the halt.

There is only one pin that may cause some trouble with different printers. Pin 18 is often used to supply five volts to drive interface devices inserted in the cable. In the Kaypro this current is supplied through a current-limiting resistor, R21. If your printer also supplies five volts on this line, you may discover that the conflict prevents the device from working. The easiest solution is to remove R21 in the Kaypro. As this resistor is not shown to be installed either on the Kaypro circuit diagram or on the connector diagram, it is possible that it is not inserted in your machine.

Some printers have provision for other input signals to control their operation. There might be a master reset, or a signal to control whether a line feed should be inserted after a carriage return. Common pins for these functions are 31 and 34. Usually, leaving these pins open simply means that the corresponding function cannot be used, or that it defaults to some preset value. Often this preset value is controlled by an internal switch.

High Data Transfer Rate

The data transfer rate through a Centronics interface can be very high, especially when used with buffered printers. For this reason, attention has to be paid to signal shielding. The original standard specified that the cable should be twisted pair – that is, each signal wire is twisted with an earthed wire before the whole lot is bundled into its jacket. Twisted pair cable is expensive, but may be necessary for high transfer rates over longer cables. The twisted pair history is the reason each signal wire has an earth 'mate', sometimes called a RETURN. If using ribbon cable, the signal and its return are all connected correctly. If you use a hand-wire cable, it is acceptable to connect all the earths together, but don't expect reliable performance over more than two metres.

Parallel Input/Output Devices

In the Kaypro, the Centronics interface is implemented using a Z80-PIO (Parallel Input/Output) device, referred to as the General Purpose PIO. This chip supports two independent bi-directional eight-bit ports, but only port A is wired to a connector. The characteristics of the port are controlled by a command word written into the command register of the device, and in this application it is set up as a simple latched output port.

The STROBE* and BUSY signals are two lines of a different PIO device – the System PIO. These lines are on port A of the system PIO, but this port is set up as 'bit control'. This means that individual bits of the port are assigned to be either input or output, and the port as a whole will be both an input port (to read those bits assigned as input), and an output port (to send data out on those bits assigned as output). STROBE* is bit 4 of this port (output) and BUSY is bit 3 (input).

Therefore, the procedure for outputting a character is for the Kaypro to continually read port A of the system PIO until it detects that BUSY has dropped. It then puts the data to port A of the GP-PIO and pulses the STROBE* line. The printer detects the STROBE* signal and reads the data from the interface.

System PIO port A is at I/O address 1Ch, and the general purpose port A is at I/O address 8h. The complete code to send a character is given in Listing 1. The status routine simply tests bit 3 of port 1Ch and returns FFh if it is set. (Both BUSY and STROBE* are inverted by the buffers, so bit 3 set means BUSY is low and the printer is ready.)

If the printer is ready, the program writes the byte in C to port 8 and reads the system PIO. This reading is necessary as other important functions are controlled by the system PIO and it is important that only the STROBE* signal is altered. Bit 4 is set high and the byte is written back to the port, then it is set low and the byte is written back again. As the signal is inverted before being sent to the interface, this has the effect of putting a brief low pulse on the STROBE* line which the printer interprets as the signal to read the data from the interface.

Other Uses For Centronics Interfaces

If you don't want to use the Centronics interface as a printer output port, there are other ways in which it can be used. First, BUSY and STROBE*, as they appear at port 1Ch, can be used as single-bit input and output signals on their own. In addition, the general purpose port can be reconfigured as an input port or even as a bit-control port, providing the interface IC is removed.

This interface IC is the chip identified as U52, in the middle of the board towards the back. It is a simple buffer, used to isolate the relatively expensive PIO chip from the potential dangers of a rear panel connector. If it is removed, the buffer function can be performed by a set of jumper wires inserted into the socket. Eight short wires are needed ▶

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and they should connect pins 9-11, 7-13, 5-15, 3-17, 12-8, 14-6, 16-4 and 18-12. With these jumpers in place the port can be reconfigured to any required format.

The port is configured by sending a control word to its command register. In the case of general purpose PIO port A, the command register is at I/O address 8h. For a simple input port, use 4Fh. There is a bi-directional mode (8Fh), but few devices use a bi-directional data path, and without access to the PIO's own handshake lines it is difficult to control the port in bi-directional mode.

The final mode is control mode. In this case the command word is two bytes long. The first byte is CFh, and the second byte determines which bits are input and which are output. If a bit is set, the corresponding bit of the port will be input. If it is clear, the bit will be output. Therefore, if you have a device which requires four bits of output data in bits 0 to 3, and returns four bits of input data on bits 4 to 7, then the instruction sequence:

LD A,0CFH OUT (9),A LD A,0F0H OUT (9),A

will set up port 8 so that a write will output the data in the lower half of the byte and a read will return the input data in the upper half of the byte. ❑

Listing 1. Character in C to Centronics output port.

```
LISTST:     IN    A,(1CH)
            BIT   3,A
            RET   Z
            LD    A,0FFH
            RET

LIST:       CALL  LISTST
            JR    Z,LIST
            LD    A,C
            OUT   (8),A
            IN    A,(1CH)
            SET   4,A
            OUT   (1CH),A
            RES   4,A
            OUT   (1CH),A
            RET
```

Table 1. Centronics connector, Kaypro version.

Front of socket/Rear of Plug

STROBE*	1	19	GND
DATA0	2	20	GND
DATA1	3	21	GND
DATA2	4	22	GND
DATA3	5	23	GND
DATA4	6	24	GND
DATA5	7	25	GND
DATA6	8	26	GND
DATA7	9	27	GND
	10	28	GND
BUSY	11	29	GND
	12	30	GND
	13	31	
	14	32	
	15	33	GND
GND	16	34	
GND	17	35	
+5 V (*)	18	36	

* - See text

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your TI computer

By Peter Lynden

BEFORE BEGINNING what I hope will be an informative guide for beginners to the 99/4A and its peripherals, a brief word about the position in which we TI owners find ourselves might be appropriate.

Those of us who have owned 99/4As for some time were shocked by TI America's withdrawal from the home computer market late last year. Others bought the company's home computers because of the subsequent price reductions. The result is the same. We must now consolidate our position and stay together, as the saying goes.

That's what this column will be all about; I hope to bring you the latest news on hardware and, especially, software. As well, I would like to try to answer any questions you may have regarding the 99/4A, and you might like to write to me here at *Your Computer* magazine.

News

Although TI has withdrawn from the home computer market, this only applies to production. Software and hardware, albeit in limited quantities, are still available. TI has also guaranteed to honour the twelve-month service warranty issued with every purchase of a 99/4A. This should be good news to some who were unsure about servicing arrangements.

The question of software availability seems to trouble owners most, and here I have some good news to report. Companies such as Imagic, Atarisoft (makers of Donkey Kong and PacMan), Walt Disney, Romox, and Sierra On-Line have all agreed to produce software for the 99/4A. Some of these products are already available from mail order houses in the States.

TI has also announced that it will issue licences for its auto-incrementing GROM chip, found in newer model 99/4A machines, to interested third-party manufacturers. Old-timers will recognise this as being a complete reversal of the situation that existed only six months ago, when TI showed a definite unwillingness to talk business with anyone. They even went so far as to threaten to sue anyone who attempted to make cartridges for their home computer! Funware Inc, manufacturers of the Ambulance, Rabbit Trail and Henhouse modules, are a recent casualty. The exact reason for their demise is, as yet, unclear, but they openly challenged TI by producing these modules in the States, claiming they would run on any old or new 99/4As. As it turned out they don't run on the newer V2.2 cream-coloured 99/4As.

Now the situation has changed, and it is indeed welcome news. Just how soon we see this new software is anyone's guess. So, for the moment I am utilising the services of two mail order houses in America, and I would urge you to do likewise. I can recommend the International 99/4A Users Group, PO Box 67, Bethany, Oklahoma 73008 (US$16.00 to join); and Tenex, PO Box 6578, South Bend, Indiana 46660. The latter publishes a terrific free catalogue with over 40 pages of software and hardware for the 99/4A.

A Guided Tour

As a member of the Texas Instruments Sydney Home Computer Users Group (TISHUG), I get many phone calls asking for advice and help with software and sometimes hardware. These aren't always easy to answer over the phone, so I would like to give you a brief overview of the 99/4A and its associated peripherals. Grab your hats and here we go ...

You really don't need to know much about how a computer works to use one effectively and enjoy it. The computer is 'dumb', so you need to tell it exactly what to do. Therefore, you supply it with information in a way that lets it understand what you want. This information is in the form of data and instructions (numbers and letters) and is commonly called a 'program'. You can either buy the desired program or you can write it yourself.

Inside the 99/4A console (keyboard and memory areas) this information is stored as electrical signals called 'bits'. They are stored in a 'memory' called RAM (Random Access Memory). The 16-bit TMS9900 microprocessor inside the computer is a circuit that makes the program work and manipulates the data you have stored there. Information is moved around in groups of eight bits, commonly known as a 'byte'.

A computer's capacity to store information depends on the size of its memory. The 99/4A without peripherals attached can store 16,000 bytes (or 16K) of program data. This is stored in RAM because, as the name implies, you can put in or extract whatever information you wish. There is also 26K of ROM (Read Only Memory), but this is fixed memory: think of it as a library, supplying information to the microprocessor on how to generate sounds, graphics and so on. The ROM also contains the language the computer understands – in this case, TI BASIC. This programming language allows you to communicate with the microprocessor through the keyboard and to write your own programs.

At this point it might be useful to point out that each computer has its own version of BASIC and that, as a rule, they are not interchangeable between computers from the various manufacturers. Perhaps some day a common ground will be agreed on.

Sometimes it is more economical to buy software than to spend hours developing your own. The 99/4A accepts software in three ways:

1. Solid State Cartridges (or Command Modules). These contain ROM and plug into the right-hand slot on the console. They are convenient and usually require no other equipment, apart from a cassette recorder if you need to store data. There are arcade games, educational games and utilities such as Extended BASIC, Editor/Assembler and Minimemory.

2. Diskettes (or floppy disks). This method of storing information uses 13 cm disks made of magnetic material stored inside a jacket, with an opening where the disk drive head gains access, or reads, the information contained on the disk. The 99/4A uses single-sided, single-density disks (about 90K altogether). Disks are much faster than cassettes, but require a greater investment in equipment by the user. Loading software from disks requires the TI Peripheral Expansion System, comprising a disk controller card and disk drive fitted inside an expansion box. Extra memory (another 32K) is usually recommended for such software packages as TI-Writer and Microsoft Multiplan, as well as Logo II.

3. Cassettes. Most of you will be using this method of information storage, and yes, standard C-60 audio cassette tapes do work well on most portable tape recorders. I would suggest that you use one side of the tape only and look for a recorder with volume and tone controls (although these are not essential) and a tape counter (which is essential for conveniently locating separate programs stored on your tape). You can then write the starting digits of each program on the tape's insert card.

Most domestic recorders have reverse polarity for the 99/4A and this has been a common problem to first-time users. You need to leave the black remote plug on your cassette lead out of your recorder for it to function correctly. Inserting it causes the 99/4A to shut ▶

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down the tape motor. If you need to use the remote plug, you have to make a reverse polarity switch. If you don't know how, buy one. TISHUG should be able to help you here. Russell Welham, our Music Co-ordinator, is the person to contact.

Even though I mentioned earlier that you may never want to program, a little understanding of the languages in which software is written may help you make a wise selection for the kind of programs you need.

Command modules generally offer the fastest operation, combining high quality with ease of use, since they are written in machine language and the ROM inside these modules complements the existing memory of the 99/4A. Machine language is immediately understood by the computer and, as such, is referred to as a low-level language (as opposed to BASIC which is a high-level language because it uses English words).

Assembly language is also capable of excellent graphics and speed. Until recently, you had to buy a full peripheral expansion system and the Editor/Assembler Software Package to run programs written in Assembly language, but with the MiniMemory solid state cartridge, you can now run these same programs for a portion of the cost.

Most software for the 99/4A comes written in Extended BASIC on tape and disk. To run these programs, you will need the Extended BASIC Solid State Cartridge. It has built-in features that facilitate the creation and movement of screen graphics known as sprites, of which there are 28 available on the 99/4A.

TI BASIC, sometimes referred to as Console BASIC, is a very useable tool for many kinds of programming, but does not lend itself to the creation of smooth-moving graphics.

Since this is the first TI column and is meant as an introduction to the 99/4A, I will simply mention other languages such as Logo II, FORTH, Pilot and UCSD Pascal, and operating systems such as CP/M as being available and leave it at that. We might be able to discuss these in a future column.

In future columns I will continue my guided tour, discussing the peripheral expansion system, printers, joysticks and more software, as well as reviewing the latest books and games.

I look forward to hearing from you.
Happy TI computing. ❑

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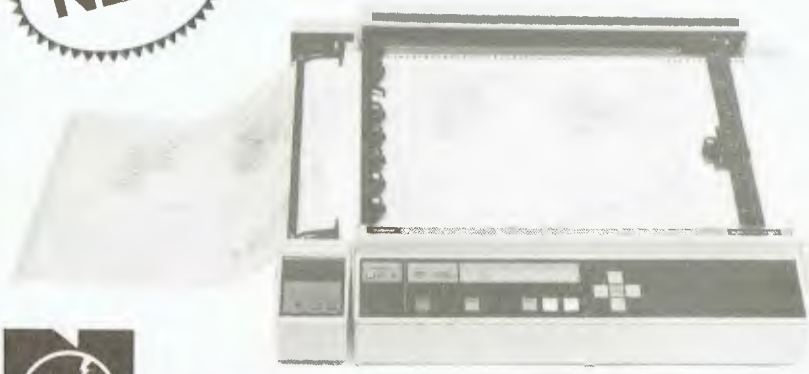

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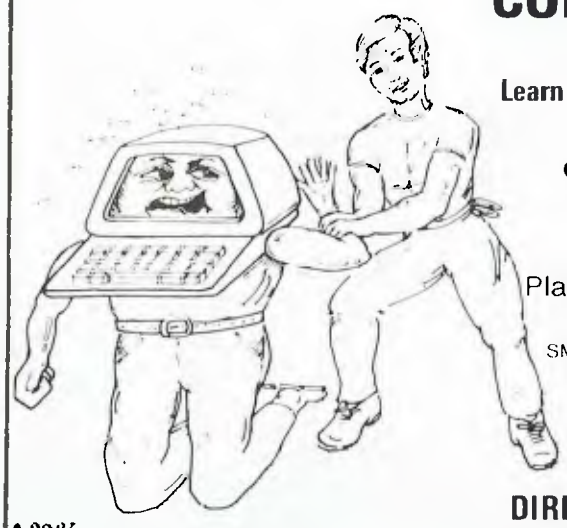

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your ATARI computer

By Ernie Sugrue

WELCOME to the Atari column again – hope you enjoyed the last one. This month I've reviewed the Atari program Caverns of Mars, and the Atari 600XL and 800XL computers. Unfortunately, due to lack of space, the tutorial I promised on Adventure writing will appear in a later issue.

Caverns of Mars

Caverns of Mars is yet another shoot 'em up game. It is marketed by Atari, so the price is automatically high ($79.95) – high for an arcade game anyway. It was originally released by Atari Program Exchange, but the people at Atari were so impressed by it that they smartly placed it on their following year's (1982) release list.

In Caverns of Mars, Mars has declared war on Terra IV. Martian forces are surrounding the planet and demanding its surrender. Luckily, one fighter has managed to escape to challenge the Martian defences. That poor soul is you! Your ship, Helicon VII, has been assigned the task of penetrating deep into the Martian underground and activating their deadly fusion bomb.

Once activated, it cannot be reset or stopped. You must make good your escape within a specific period or the cavern (with you in it), will be blown into non-existence. However, if you do escape, another cavern magically appears for you to conquer. There are a total of five caverns to attack.

You are given five ships for the mission. On the Novice level you are simply required to traverse two caverns, activate the bomb and get out. In the second to the fifth caverns things gradually move faster and faster. In higher levels (Pilot, Warrior and Commander), extra caverns are added for you to conquer.

The Helicon VII, like all spaceships, needs fuel. Your initial supply is 99 units and you must constantly be on the lookout for more fuel pods to destroy and thereby replenish your supply. If your fuel runs to zero, you lose a life. You may also obtain fuel by destroying the 'Pyxias' rockets in level two.

The screen constantly moves upward. Your spaceship can be moved left, right and, to a certain degree, up and down. It is best to stay near the bottom of the screen on the way down, and near the top of the screen for your escape so you can, if necessary, get out of the way in a hurry.

Level one of the caverns simply involves moving through a twisting cavern (nothing shooting back...yet). Destroying fuel pods and radio transmitters situated on the cave ledges gains points. Level two introduces you to the Pyxias rockets which, while they may not fire back or even move (except for their rapid vertical climb), do overwhelm you in sheer numbers.

Level three is where the fun really starts. Here you meet the laser gates, made of pure energy, which will destroy you on contact. Worse still, your laser torpedoes are useless. You must get to know the rhythm with them. It may take quite a few games for you to progress past this obstacle.

In level four, the space mines are your main worry. Your laser torpedoes will blow them into stellar dust, but this is difficult to achieve as their movement is highly unpredictable. Don't forget to grab more fuel in your spare time.

Level five is the most boring level, although the hardest to conquer. You must manoeuvre your ship through passages, both vertical and horizontal. When you remember that you're not very good at moving vertically – in the true sense – you'll realise how difficult this stage is. Then, at last, comes the base.

Have a rest, let the ship fly itself to the bomb, activate it and fly out of the base. Then take control and manoeuvre backwards through the four caverns (cavern two is not repeated), being careful not to crash. The timer at the bottom of the screen won't stop or reset. Crash too many times and you will run out of time with a bang – that is if you don't run out of lives first.

The good points of the game are the great variations in what you have to do; the fact that, in many cases, you have to think before you act; and the many skill levels which make it a pleasure to play from the first time to the hundredth time. However, I think the sound could be improved slightly, as could the vertical movement control.

If you find you are entering the caverns for the fifth time and have still got a few lives up your sleeve, get destroyed as close to the end as possible, and use up all but one of your lives. The game automatically ends after your fifth traversion anyway. Another hint which is undocumented in the instruction manual: if you press <SHIFT> <CTRL> and <CLR/SET/TAB> together, you will instantly be transported to deeper caverns.

The instruction manual that accompanies the program is excellent, explaining in detail the object and strategy of the game. This kind of instruction manual is far better than the cardboard package instruction manual that some manufacturers love. It has been suggested that Caverns of Mars is Defender played 'sideways', but really it is an entirely new game with new objectives and strategies.

Caverns of Mars is available from Computerwave in Sydney, Exec-U-Games in Brisbane, and from most Atari retailers.

A Good Book

The *Addison-Wesley Book of Atari Software* is published annually by The Book Company, Los Angeles. It contains hundreds of reviews of all types of software for the Atari computer, and also for the Atari VCS. It is edited by a trio called Stanton, Wells, and Rochowansky.

Each reviewer takes about half a page to explain the main object of the program, its useability, and good and bad points, as well as giving a summary table. I've found about 90 per cent of all programs I wanted to know about in this book. The ones I couldn't find probably weren't published when the book was written.

Programs reviewed are divided into eight main sections, which are further divided into sub-sections according to interest. For example, the 'Games and Entertainment' section is divided into 13 parts, including adventure games, fantasy and role playing, board, sports, gambling and card games, shoot-'em-up arcade, arcade style, arcade maze, puzzle and strategy, music, tactical, space and war. As you can see, finding the review you want is extremely simple. There is also a comprehensive index, listing all titles, the type of program and page, plus an interesting list of the names and addresses of all the companies whose products are reviewed, which runs to about 90 entries.

The book is priced at US$19.95 (even though this is a review of the 1983 book, the 1984 edition should now be available). The price can rise to about $35.00 by the time the book gets to Australia.

If you cannot find a copy at your local computer dealer or bookstore, you can order one from the US. Write to: B. Dalton Booksellers, Mail Order Section, 9340 James Avenue South, Minneapolis, MN 55431, USA. Be sure to include $19.95 + $16.00 postage (airmail). The company accepts Master- ▶

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Atari 800XL and Atari 800 Comparisons

The Atari 800XL and 600XL spearhead a new range of products available for the Atari computer. The machines are identical except for the RAM supplied: the 600XL has 16K, the 800XL 64K. The 800XL, with its black and cream colouring (the keyboard and surrounding plastic are black, and the top portion is cream), appears at first glance to be more 'professional' than the 800. It is also slightly trimmer than the 800, largely because the lift-off lid (where the RAM boards and cartridges go) is missing. The computer therefore has an even surface, with a single cartridge-slot replacing the two found on the 800. This is not covered, except by a push-in lid that almost dares you to shove your finger into the slot!

The absence of one of the slots from the 800 is not a detracting feature as the BASIC language, which had previously been available only on cartridge, has been built into the computer. If you wish to disable BASIC, which was formerly done by unplugging the BASIC cartridge, you do it by holding the Option key down while turning the computer on. It can also be done using POKEs inside a program.

The 800XL keyboard layout differs very little from the 800. The right Shift and Inverse keys have been reversed; and another button, labelled Help, has been added to the System Reset, Option, Select and Start buttons on the far right of the 800. This button can be used in a variety of ways, the most obvious being in games, where pressing it would display a clue or hint (as in an adventure). In the game 'Soccer', it is used to pause the game. It will, however, work only with programs that have a help feature built in – pushing the help key while in a program that was made before the XL series was marketed is useless.

Other new features include an international character set, capable of displaying 29 characters that are often used in non-English alphabets, and a rear slot that acts as a processor bus (an extension of the main circuit board which makes the expansion possibilities of the XL series almost limitless).

Programs for the 800 are fully compatible with the new machines, so if you want to upgrade to one of the new models, your programs should run. I say 'should' – they would if correct programming was used. If, however, the programmer took a few shortcuts in the program, it may not work properly. Apparently the success rate is 90-95 per cent.

All the 'standard' Atari features are retained in the new models: five test modes, eleven graphics modes, 256 colours, four sound voices and high-res graphics. However, two controller jacks have been removed, leaving two.

Both models (600XL and 800XL) should be available by the time you read this. The 600XL (16K) costs $399 and the 800XL (64K) is $599. They are available from ComputerWave in Sydney, Exec-U-Games in Queensland, and Atari retailers nationwide.

Well, that's about it for another month. I'd like to thank Exec-U-Games in Maryborough for all the help they gave me in preparing the 800XL review. ❑

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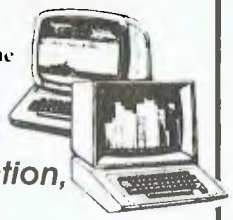
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By Andrew Farrell

MANY OF YOU may be under the impression that I worship Jeff Minter, but really I hate him. Yet again the master behind games such as Matrix and Lazer Zone has appeared with a new, deadly, addictive creation which breaks all previously known rules of game design.

Yes, it's the long awaited sequel to Attack of the Mutant Camels. This time you're at the receiving end, playing the role of a ninety-foot high, neutronium-shielded, lazer-spitting mutant camel.

Minter has lined up 42 levels of devilish creations from the real world, in an environment which makes them appear totally unreal. Confused?

What is a London telephone booth doing in this vast expanse of palm trees and pyramids which wink as they pass in the background? There are also aggressive Australian alpinists, falling telephones and flying silicon chips.

Revenge becomes a comedy in this game, though much of the humour may be wasted on the large proportion of non-British people who will play the game. A little wangling on my part gained me a sneak preview of some of the higher frames, and believe me, the going gets rough.

Revenge of the Mutant Camels is distributed by Progressive Software and sells for around $29.95.

I almost forgot the most important thing about this game: it loads from cassette faster than it loads from disk. Using a special turbo-load, high-density recording method developed in Germany, Revenge has almost made the disk drive obsolete. Several other software houses have also promised to start using this method during coming months. So, burn your disks and buy a cassette player.

Portable Price Drop

The recently released SX-64 portable has officially dropped in price to $1499, making it very competitive with similar systems which are bought in individual pieces. By the way, Commodore has included a drive reset button in the nicely concealed control panel.

Most of this month's column was prepared using the SX, and I must say the keyboard is very pleasant to use. The fact that it is detachable makes typing on your lap far more comfortable.

Rasters

Several readers have enquired about the legendary raster interrupt. Don't fret, I'll explain what that is in just a moment. Nearly every so-called expert will calmly explain that anything may be done with this amazing feature, from writing Space Invaders using eight sprites, to bi-directional multi-speed bit lateral scrolling (whatever that is).

Now to the technical bits (bits – get it?). While you are busy watching Rocky VIII on you video recorder, your television is hard at work keeping a picture visible.

Next time you're watching, have a close look at the screen. You may notice a small dot travelling past your eyes at around 50 times per second (don't worry if you can't quite make it out). This small dot is called the raster. (Note: television technicians please disregard anything written on this page.) It travels from left to right across the screen and where a dot is required it leaves an image in the correct colour. The speed at which this system operates accounts for the apparent constant picture which appears on the screen. How can this information be of any use to you? Patience.

Vic II Chip

What is so good about the Commodore 64 that makes people throw Apples off the Gap and buy one? The Vic II Chip may well be part of the answer (it certainly isn't the disk drive speed). This chip has several powerful facilities that make complex programming feats simple.

One of these features is the storing of the actual raster position into a memory location which may also, in turn, trigger an interrupt.

What is an interrupt? An interrupt is an event which occurs around 50 times per second and controls the living force within your computer. Things such as flashing the cursor, updating the screen and servicing all the little clocks and timers depend on it.

The actual interrupt routine or program is stored in ROM; however, the pointer which says where it actually starts is in RAM. Therefore we can, by changing this pointer, add our own routines to the usual interrupt cycle.

On the 64 there is also another way to alter the interrupt cycle. As I mentioned earlier, the raster position is latched into one of the memory registers in the Vic II chip. The magic locations are 53265 ($DO11) and 53266 ($DO12). The first register contains the MSB (Most Significant Bit) of this value and the second contains a value from 0-255. Most of the time we simply ignore the first register.

By reading the raster position it is possible to control when data is actually placed on the screen and time it to only make alterations when they will not be visible. Better still, by writing to the raster register we can force an interrupt to occur when the raster reaches the value which was written. That is, you may set the raster register so that when the raster reaches the value you specified it will cause a jump to your special routine. This is a fairly tricky piece of work, requiring the correct setting of the interrupt registers and raster register. Most work in this area is best done from machine code, for simplicity and speed.

Unfortunately, this month I was caught with some nasty problems and have been without the use of my 64 for several weeks. However, May issue will contain a few programs showing some practical uses of all the above information. Anyone with specific questions related to raster interrupts or smooth scrolling, which will be covered over the coming months, should write to me at:

Your Commodore 64 Column,
PO Box 586,
Mona Vale, 2103.

I can't promise to answer letters individually, but I will try to deal with them through this column.

Simon's BASIC

The most wanted cartridge since the Commodore 64's release has been Simon's BASIC and at last stocks are reappearing in some stores. You must have heard enough about it by now to know that it is certainly a very powerful addition to the standard Commodore BASIC. ❑

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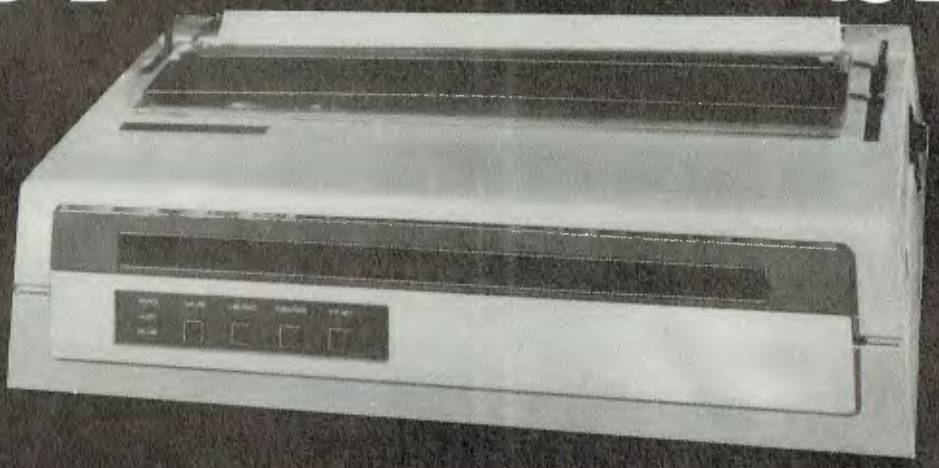

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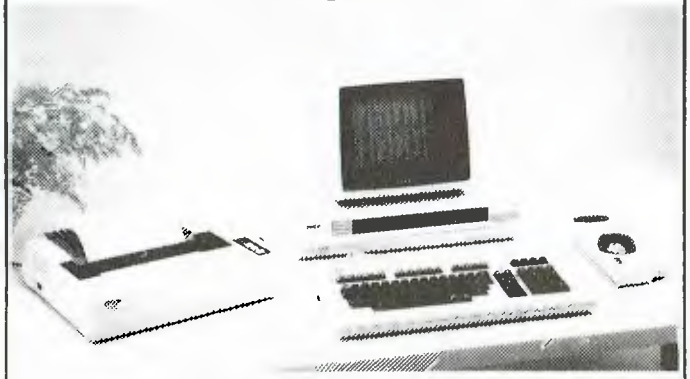

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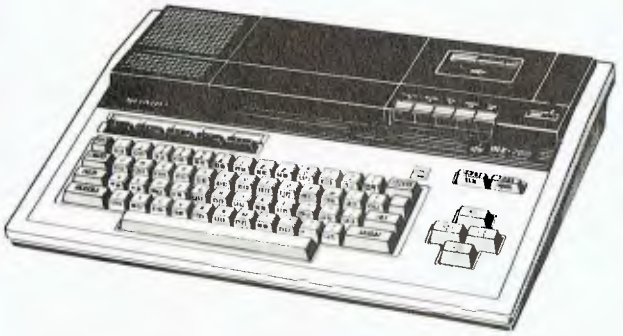

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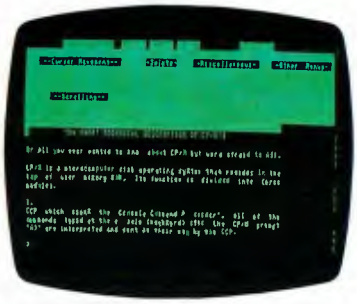

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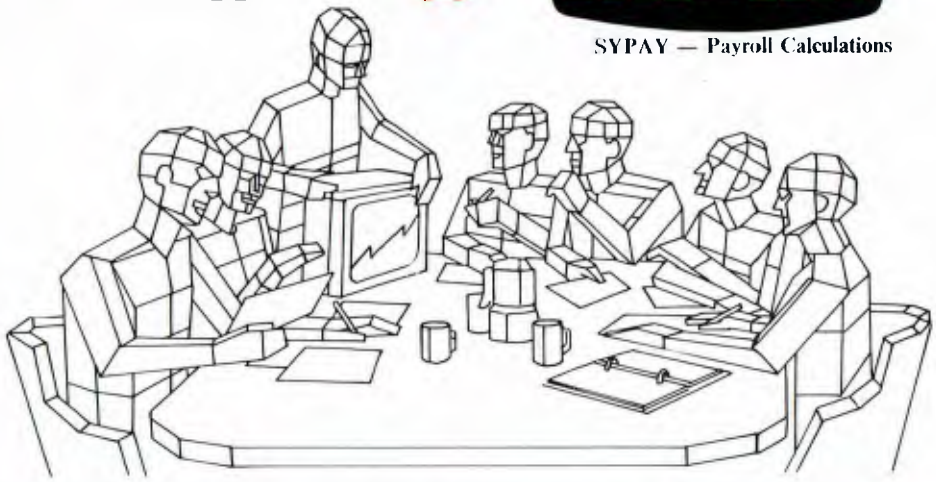

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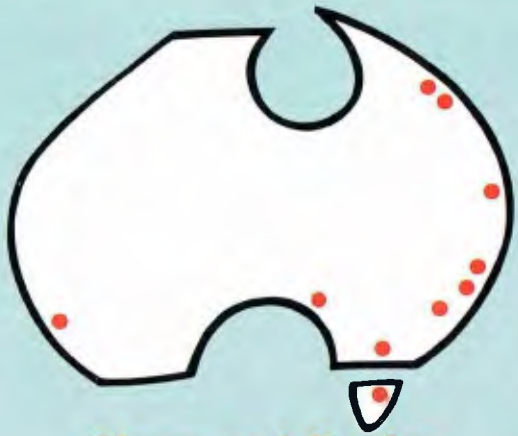

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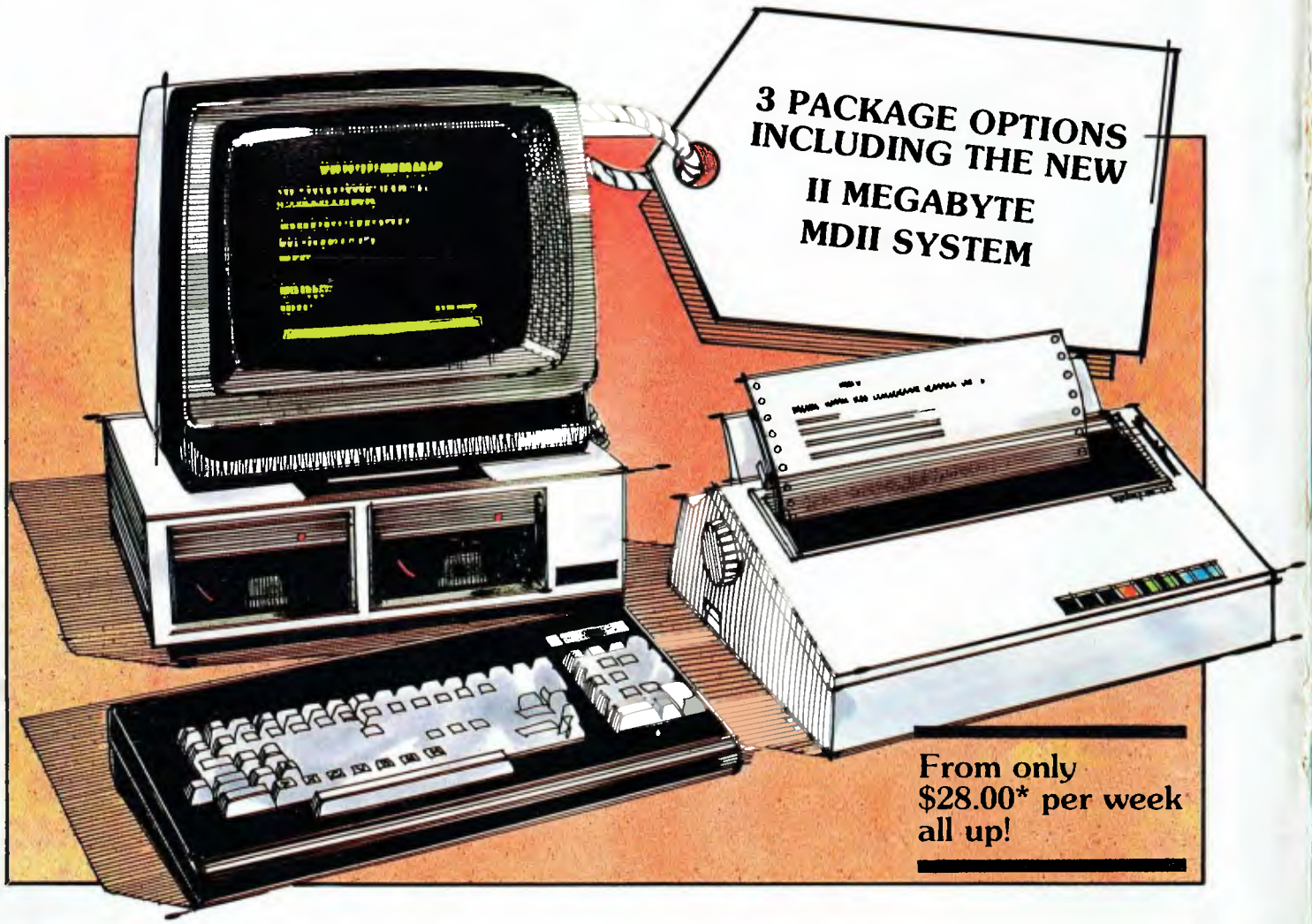

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