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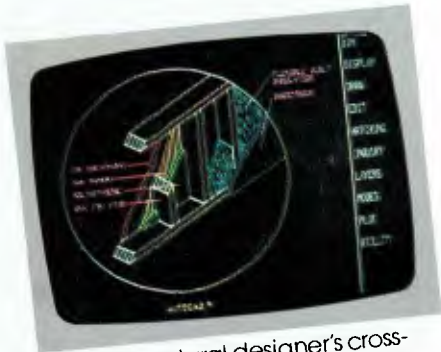
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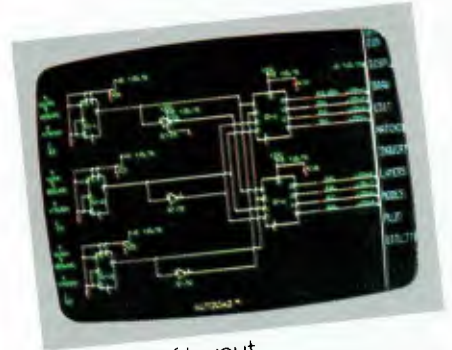
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Architectural designer's cross-sectional detail in perspective.



Front and side elevation of a mechanical engineer's drawing.



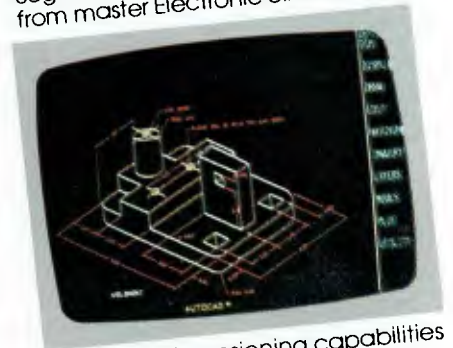
Segment of layout from master Electronic circuit.



Architect's drawing of a front elevation.



Autocad in the application of road & traffic control.



Isometric dimensioning capabilities of Autocad.



Autocad in the use of floor planning and space optimization.



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EDITOR

Natalie Filatoff

CONSULTING EDITOR

Les Bell

NEWS EDITOR

Rose Vines

ART & DESIGN

Mark Elder

ART PRODUCTION

Sharon Hill

ADVERTISING PRODUCTION

Danny Hooper

MANAGING EDITOR

Matt Whelan

PUBLISHER

Michael Hannan

CONTRIBUTORS

Australia: Brendan Akhurst, Bill Bolton, Annette Brown, Andrew Farrell, Phil Grouse, John Hepworth, Norman Kemp, Frank Lee, Peter Lynden, Bruce Mitchell, John Nicholls, Jeff Richards, Rod Stevenson, Dom Swinkels, Colin Tringham.

United States: Howard Karten

The UK: Martin Hayman

OFFICE SERVICES

Felicity Skinner

SUBSCRIPTION ENQUIRIES

Julie Plummer

ADVERTISING MANAGER

Mel Godfrey

ADVERTISING SALES

Damien Prins, Andrea Beaty (NSW Advertising) David Farrington (Victorian Advertising)

NSW

140 Joynton Ave, Waterloo 2017.

(02) 663-9999

Telex: FEDPUB AA74488

Victoria

150 Lonsdale St, Melbourne 3000.

(03) 662-1222

Telex: FEDPUB AA34340

Western Australia

Ian Greenacre, Gordon & Gotch Adv't, 134-144 Parry St, Perth 6000.

(09) 328-8044

Queensland

John Perry, Federal Publishing, 25

Balaclava St, Woolloongabba 4102;

(07) 391 8922. Telex AA145520.

South Australia

Steve Birbeck, Admedia Group,

24 Kensington Rd, Rose Park 5067.

(08) 332-8144

New Zealand

Chris Horsley, 4A Symonds Court,

Symonds St, Auckland, NZ.

Telex: TEXTURE 260753

Source Mail: Les Bell TCY314; Matt

Whelan TCY267.

Bulletin Board

(02) 662-1686 — Les Bell 1085,

Matt Whelan 1, or leave a

message in comments.

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EDITORIAL

Software Distribution - Back to the Golden Days ...

I've been impressed recently by several low-cost software projects under way in the US, where they seem to take a much more innovative view than we do here.

Many of our readers will remember the early days of personal computing (only it wasn't called that then), which were characterised by a spirit of sharing. It still exists to some extent in public domain software, but to nothing like the same level.

Back in '75, virtually every personal computer owner wrote programs, simply because there was no existing software. Having written something original, he or she was then encouraged to pass it on. Now they'd paid their dues, so to speak, they could use the programs others had written with a clear conscience. Since everyone had written some software, everyone understood its value, and piracy was not a problem.

Times have changed: ten years ago, the vast majority of PC owners contributed some software; today, virtually none do. Back then, microcomputer owners were cranks; today, they're the target of sophisticated marketing campaigns. Most current PC users have written no software, do not value it particularly highly, and think those who do write software are cranks.

It's refreshing, and encouraging, therefore, to see something of the old spirit is still alive, and that people are working out ways to cope with these problems. In *Dr. Dobb's Journal*, for example (probably the original hacker's magazine), there are attempts to get a project called GNU underway.

GNU stands for Gnu's Not Unix — as neat a recursive definition as I've seen — and is an attempt to write a public domain operating system similar to Unix. GNU will not be in the public domain, but no distributor will be able to restrict its further

distribution.

Lending credibility to the concepts behind GNU is the fact that its originator is Richard Stallman, the author of the popular EMACS editor and a former researcher at MIT's Artificial Intelligence Lab. In a well-reasoned article, Stallman argues free software has a place in today's world, and counters objections.

Not free, but certainly low-cost, is a concept from Prologics Corporation in the US, which produces a programmer's editor called See. This is distributed in a demonstration version which can be 'unlocked' on receipt of a special code. This, in turn, is obtained from Prologics on payment of the cost of the software.

Nothing new about this; what's new is that Prologics is able to trace each copy of See and pay the 'father' of that copy a \$5 'spotter's fee', the grandfather \$4, the great-grandfather \$3, and so on. Now, in Australia, this comes perilously close to the pyramid selling provisions of the Trade Practices Act, so it may not be workable here. I'm no lawyer, so I can't say.

But my point is that this scheme discourages piracy and rewards legitimate distribution of software. It also takes word-of-mouth advertising to its highest level yet and allows a small, probably undercapitalised company to stand a much greater chance of success with its product.

With the under-achievement in the marketplace of the integrated software packages, despite massive advertising campaigns, we are perhaps seeing that the application of resources — lots of venture capital, lots of programmers, lots of advertising — is not an infallible guarantee of success.

We can only hope it is *not* a requirement for success, and that a good idea, valued highly by users, still has a chance of success. □

TURBO FAMILY

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TURBO PASCAL 3.0

With over 250,000 users worldwide Turbo Pascal is the industry's de facto standard. And now, with version 3.0, the world's fastest Pascal compiler is twice as fast! A full-screen interactive editor is built-in and for IBM PC versions we've included turtle graphics and full tree directory support. Available for most computers running PC DOS, MC DOS, CP/M 80 or CP/M 86. And you pay no royalties! Turbo Pascal \$119.95 Turbo BCD+ \$199.95 Turbo BCD \$189.95

\$119.95

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The Turbo Graphix Toolbox will give even a beginning programmer the expert's edge in dazzling graphics on the IBM PC. It's a complete library of Pascal procedures including window management, tools that let you draw and hatch graphs and shapes, procedures that save and restore graphic images to and from disk, curve plotting functions, animation tools and lots more. You get commented ready to go source code for all these functions. The price? Just \$99.95. And no royalties!

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Turbo Tutor

The Pascal tutor for everyone from novice to expert. Even if you've never programmed before, Turbo Tutor will get you started right away. If you already have some experience with Pascal or another programming language, Turbo Tutor will take you step by step through topics like data structures and pointers. If you're an expert, you'll love the sections like "How to use assembly language routines with your Turbo Pascal programs." All the examples in the book are included as source code on the disk - ready to compile. And it costs just \$67.95

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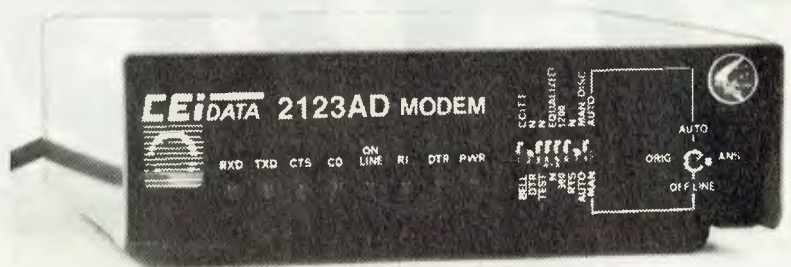
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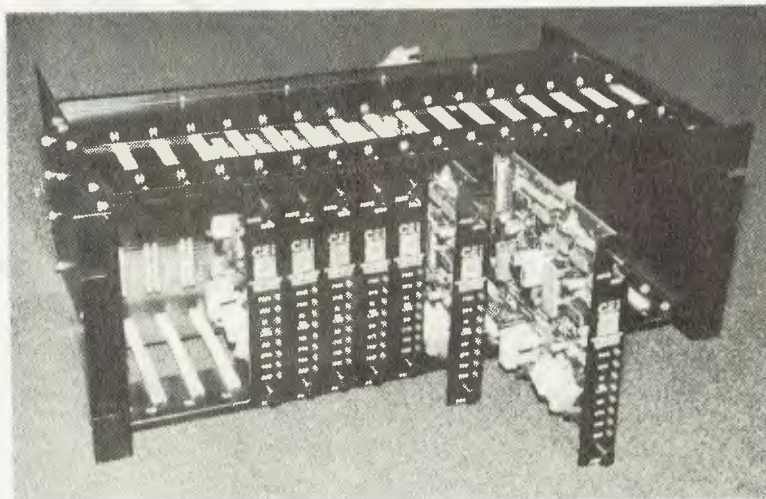
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The 2123AD comes in an all steel housing for good RF rejection and has its own inbuilt 240/120 V power supply.

Front Panel has 8 status indicators to assist in fault finding. A single 3 position switch controls the manual or auto answer modes of the modem.

Eight front panel programming switches select the standards used as well as DTR/RTS overrides, allowing simple three wire control of modem.

Full RS232/V24 remote controls are provided including DSR and STF. The latter allows the transmitting channel to be remotely controlled.



The 2123AD can be used in a rack mount system expandable in modules of 16 to suit network operators.

Best of all, there's the reliability. Thousands of satisfied operators confirm that CEIDATA modems are perhaps the most reliable available in Australia today, at an unbeatable price/performance package. But act today and update with **CEIDATA 2123AD SMART MODEM**.

Four optional boards can be plugged into the modem allowing:-

1. Automatic baud rate conversion when using 1200/75 mode. This allows the modem to look like a 1200/1200 Full Duplex Modem.
2. Sync clock generator, generates correct sync receive and transmit clocks locked to the incoming data.
3. Automatic dialler/baud rate converter allows "Hayes" compatible software to automatically dial the required telephone number. This option also includes a baud rate converter.
4. Battery adaptor powers modem up in response to an incoming ring and powers the modem down on loss of carrier. Eight "AA" batteries will typically power the modem for 1 to 3 years when used as a remote attachment to a data logging system.

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AT LAST — THE AT

REMEMBER THE excitement when IBM originally announced the details of its Advanced Technology PC, the AT? It sounded like a good thing — a powerful machine which would offer significant price/performance advantages over its predecessors.

Well, that selfsame (almost) machine has at last reached our shores (again, almost). The normal delay between a machine being released in the States and its release here has been lengthened by the problems which beset the AT's hard disks, but the company has taken orders for the machine, which it will begin to ship next month.

IBM's troubles with the AT have received a good deal of publicity (the amount of publicity being directly proportional to the level of silence on the subject by the company itself). Finding a supplier of large numbers of reliable hard disks has been difficult for IBM, with resultant delays in shipping the product. It is to be hoped the Australian version (which will come off the Wangaratta assembly lines) will be free from hard disk crashes. IBM prides itself on the reliability of its equipment, so we should expect to see a solid version of the machine here.

What's in the Box?

Perhaps the AT's biggest attraction is the Intel 80826 processor on which it is based. This provides a lot of processing power, enough to make the AT usable both as a standalone machine or as a multi-user system. Up to 3 Mbytes of RAM can be addressed, with the base model containing 256 Kbytes and a 1.2 Mbyte high-capacity diskette drive, while the enhanced model contains 512 Kbytes of RAM, the 1.2 Mbyte floppy and a 20 Mbyte hard disk.

Prices start at \$7821 for the base model, and on top of that you'll have to stick an operating system. PC-DOS 3.1 and PC Xenix, both announced at the same time as the AT, will set you back \$121 and \$724 respectively.

PC-DOS 3.1 supports all IBM personal computers and provides:

- booting of DOS from diskette or fixed disk
- dynamic allocation of file space
- tree-structured directories
- backup and restore commands
- file recovery utility
- job stream sequencing of programs as batch files, with conditional logic supported
- piping
- file spooling
- virtual disk support for using memory above 1 Mbyte
- support for PC network hardware and software

Other Goodies

PC Xenix is Microsoft's Unix derivative. It supports single- and multi-user configurations and multi-tasking. Based on Unix System III, Xenix provides support for memory up to 3 Mbytes, dynamic memory management, a hierarchical file system, file-sharing protection and 80287 maths co-processor support. Two command interfaces are supplied (the Bourne and Visual shells) and three program editors ('vi', 'ed' and 'sed'). To use Xenix, you'll need an enhanced model AT.

IBM's contestant in the windowing stakes, Topview, was also announced. Topview runs with DOS versions 2.0, 2.1 and 3.1, and "most



existing PC-DOS applications will run in the 'Topview environment'.

The Topview environment is multi-tasking, with windowing and mouse facilities, copy, cut and paste and DOS services. Some of the existing programs supported are: BASIC, BASIC compiler, COBOL compiler, Displaywrite 1 and 2, Multiplan, Visicalc, PC Cluster, Macro Assembler and the IBM Assistant family.

The Topview Programmer's Toolkit offers a set of tools for developing application programs that utilise Topview's facilities. The Toolkit provides examples of how to access Topview facilities, window design aid and panel utilities, program information, file and filter tables, language interfacing and pointing device support (more mice). Topview will retail for \$277 and the Toolkit for \$737.

The PC AT will be available through a network of more than 140 IBM dealers and through IBM's Branch Sales Offices. □

AMICRON WINS HEALTH CONTRACT

Australia's largest NEC dealer, Amicron Computer Services, has won its second major government contract this year, to supply NEC APC III microcomputers and develop specialised communications software for the NSW Health Department. The initial contract is for two years, with a further two-year option.

According to Amicron, the contract could involve as many as 1000 systems and will see the APC IIIs become the main microcomputers used as standalones in public hospitals throughout the state.

The department's current PCs will gradually be weaned out, making room for the APCs to provide local processing facilities such as word processing, forecasting to aid in management decision-making, use of spread-

sheets and access to small local databases in each hospital. They'll also link hospital managers to the extensive VAX system.

More than 1000 APCs have already been installed in NSW public hospitals within 12 months, and Amicron marketing director Jan Pozdena reports "many more major sales" currently under negotiation. □

CASH FOR CODE

Closet programmers come out! Jacaranda Software has announced the establishment of the Jacaranda National Educational Software Award, to be presented annually for the best software package for infant, primary or secondary use.

Entrants must submit original, unpublished work before November 1, 1985, on 13 cm disks in Apple II, BBC, Commodore 64, IBM PC or Microbee format. All entries will be considered for publication by Jacaranda Soft-

ware, and the winning entrant will receive \$1000, with \$500 and \$250 for the runners-up.

The judges will be looking for imaginative ways in which the unique capabilities of computers can be used to help students learn. Bruce Mitchell, Manager of Jacaranda Software, hopes the award will encourage the development of software combining the talents of educators and programmers.

Entry forms are available from Jacaranda Wiley offices in Sydney, Melbourne and Adelaide, or from Jacaranda Wiley, 65 Park Road, Milton 4064; (07) 369 9755. □

COMPUSHACK SLASHES APPLE PRICES

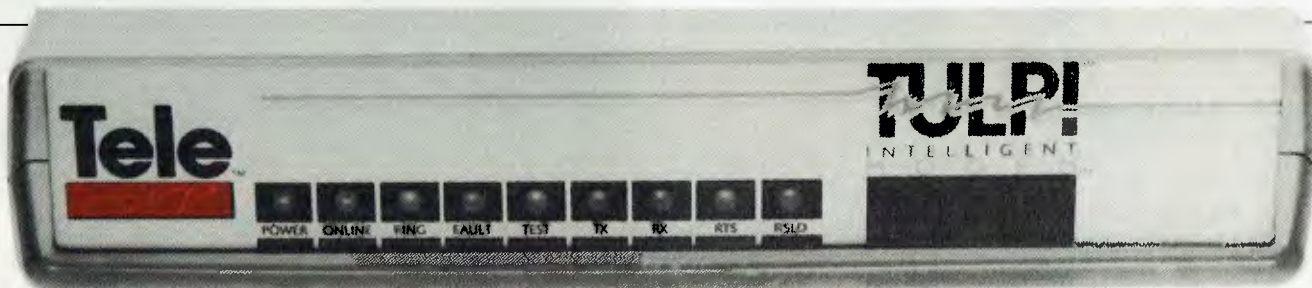
Compushack has announced some astounding reductions on Apple software, claiming the products will be sold at the "lowest

ever levels in Australia".

The company is offering a 'business upgrade' for \$395 which comprises a Z80, CP/M, Wordstar 3.3, Mailmerge, Spellstar, Infostar, Calcstar and 64 Kbytes of memory. This upgrade not only provides vastly improved processing speed with the Z80 operating at 6.5 MHz, but also opens up the world of CP/M software to Apple users.

Apart from the complete business set, Compushack has another package consisting of the Z80, CP/M, Wordstar 3.3 and 64 Kbytes RAM for \$225 (reduced from the regular price of \$695). Some individual elements have also been reduced, with Infostar costing \$175 (down from \$666) and Calcstar (for both Apple and IBM) down from \$220 to \$79.

Products will be available at these prices until current stocks are exhausted. Compushack is at 303 Pacific Highway, Lindfield 2070, and orders can be placed toll-free on (008) 23 0200. □



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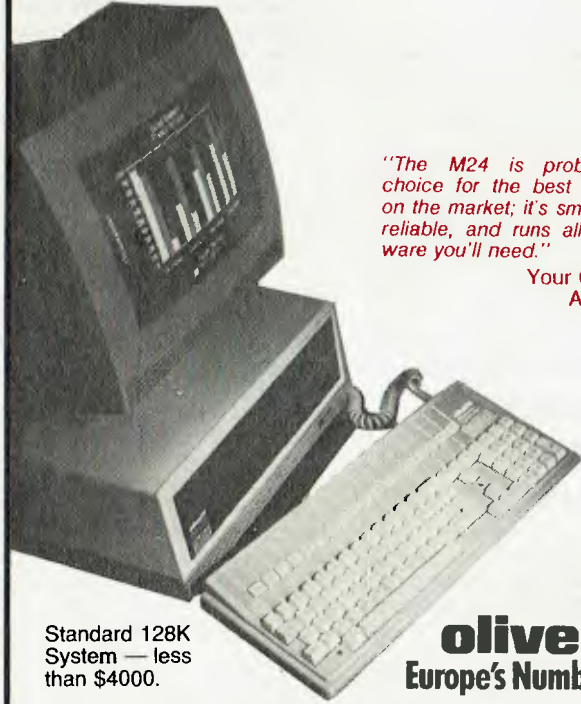
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NEWS



The Newsletter for dBase II and III users.

dBest News for dUsers

Welcome to dBest News, the first newsletter devoted to dBase users.

dLetter draws on the talents of those of Australia's most experienced dBase users and the resources of the country's most well-known computer magazines to give you the answers, information, tips, hints, and shortcuts — in hundreds of pages each month.

It means that you have at your disposal the most complete information of the dBase II/III in the English, French and German editions of dBase users who have not had a word of dBase II/III. It means that you have at your disposal the most complete information of the dBase II/III in the English, French and German editions of dBase users who have not had a word of dBase II/III.

You can read dBest News online. It's free. You can also get it on floppy disk. We've designed the dBase II/III so that you can read it on your computer. It's free. You can also get it on floppy disk. We've designed the dBase II/III so that you can read it on your computer. It's free.

Whether you're a dBase user, the developer of dBase, or a dBase user who wants to know more about dBase, you'll find dBest News a most useful reference. It's free. You can also get it on floppy disk. We've designed the dBase II/III so that you can read it on your computer. It's free.

We also have a lot of other information on our site — and encourage you to visit our site as often as possible. We'll be adding more and more information and software, making updates and providing more tips and hints.

There is one of those great programs that is simply meant to be used. It's free. You can also get it on floppy disk. We've designed the dBase II/III so that you can read it on your computer. It's free.

Getting the most out of dBase is generally a long term process. We'll be adding more and more information and software, making updates and providing more tips and hints. It's free.

dEditors

dLetter will be published in a form that is easy to read, easy to use, and easy to understand. It's free. You can also get it on floppy disk. We've designed the dBase II/III so that you can read it on your computer. It's free.

We're actually happy after the first few issues that should be published. It's free. You can also get it on floppy disk. We've designed the dBase II/III so that you can read it on your computer. It's free.

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GET dLETTER dLIVERED. CHEAP!

Tucked into the centre of this month's *Your Computer* is the first edition of *dLetter*, Australia's only independent national newsletter devoted entirely to dBase II and III users.

If you're one of the many people who have been following Les Bell's 'dBest of dBase' series and are now wondering where to turn for your monthly dBase fix, *dLetter* is for you. It offers hints, techniques and the inside dope on dBase, and is written by dBase users for dBase users.

For the first three issues, *Your*

Computer readers will receive *dLetter* free as an insert. From the fourth issue on, *dLetter* will be sent to *dLetter* subscribers only. As an enticement to readers of *Your Computer*, we are offering a special combined subscription rate, which will save you heaps.

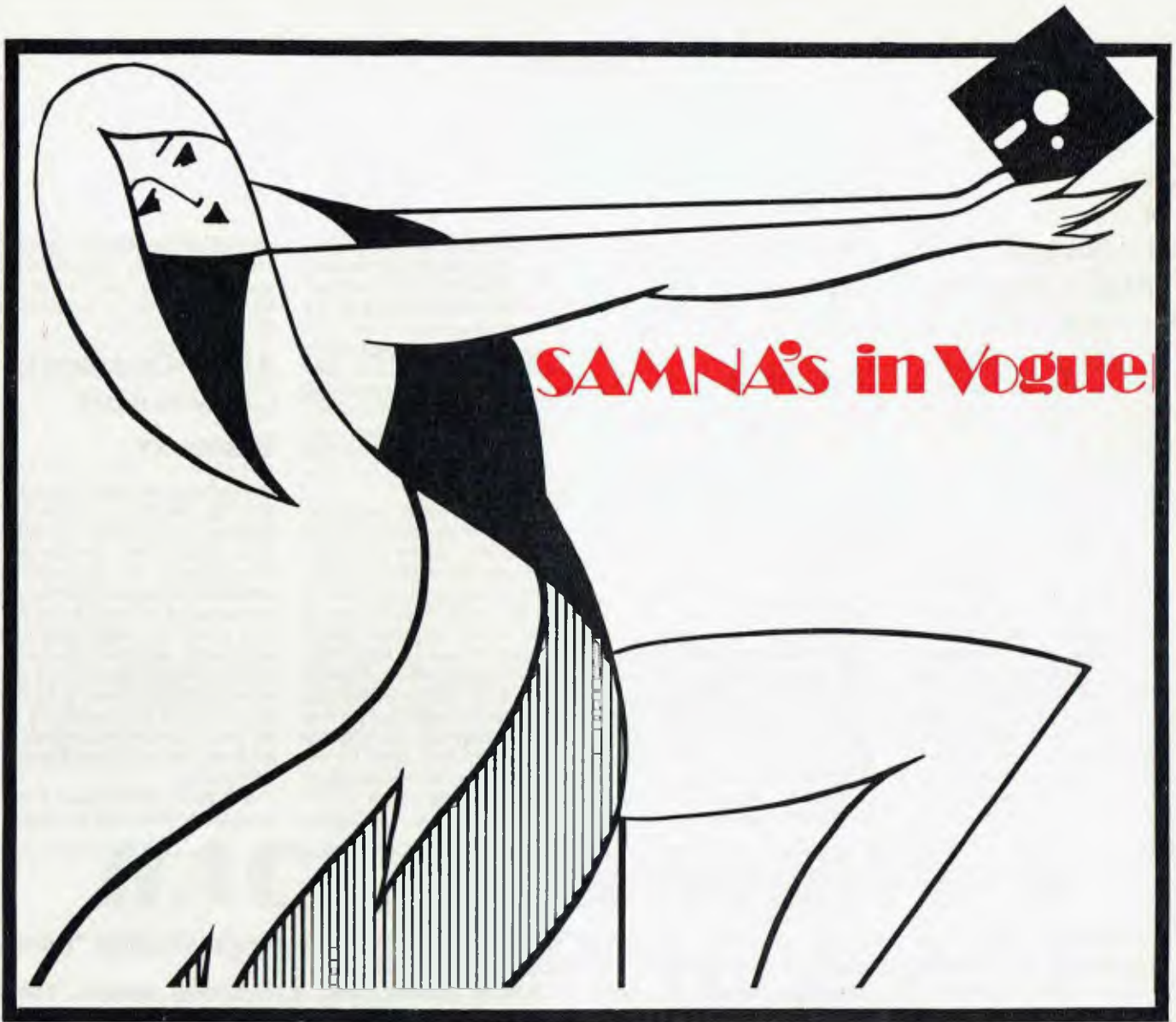
Current subscribers who wish to receive *dLetter* regularly must also fill in the subscription form, ticking the current subscriber's box. That way you won't miss out on dBest thing since dLast of dBase. Interested? You'll find dCoupon on page 138. □

HOW CHEAP CAN WE BE?

Incredibly cheap. To celebrate the theme of this month's *Your Computer* we're conducting a lucky dip for all new subscribers. For the paltry sum of \$27.99 you could walk away with 12 months' subscription to *Your Computer*, 12 months' subscription to *dLetter*

(see our other news item for details) plus a lucky dip with a (possible) value of \$800.

If this all sounds like some impressive gimmick, turn to pages 138-139 for all the convincing details. The early worms are going to get a real treat with this offer. □



SAMNA WORD III SAMNA+

If you think keeping up with the latest fashion is hard work — you should try computers. For a start, word processors that only word-process are dead. The in-word today is office automation; individual personal computers doing a whole range of tasks. Word processing, project planning, spreadsheets, to name a few.

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MELBOURNE'S TAFE COLLEGES OPT FOR NCR

NCR personal computers and data communications networks are to be installed at Melbourne's five colleges of Technical and Further Education.

Forty Decision Mate V microcomputers and five networks, worth approximately \$250,000, have been ordered. The Decision Mate is a dual-processor computer, offering 8-bit and 16-bit capabilities. The colleges already have extensive libraries of 8-bit software, but are looking toward increasing use of 16-bit programs.

The communications networks will be used to connect each college's bank of micros to a central database, stored on hard disk. Students will be taught how to operate, maintain, diagnose and repair the complete computer system, and design and engineer-

ing aspects of the system will also be covered. In addition, the colleges will offer part-time courses for self-employed people wishing to learn business computing skills. □

ASSEMBLY LANGUAGE ON AIR

'A Systematic Approach to Assembly Language Programming' is the next course to be broadcast by Radio University. The course runs for nine weeks, commencing August 27, with lectures being broadcast at 8 pm on Tuesdays and repeated at 7 pm on Fridays.

The course will be conducted by Dr Graham Hellestrand, Senior Lecturer in Computer Science at the University of New South Wales, and is designed for people with a good working knowledge of Pascal who want to acquaint themselves with the structure of the machine and mechanisms

underlying high-level languages.

Specific attention will be given to the translation of structured, high-level languages into the assembly languages of the PDP-11 and M6809 microprocessors. Concepts covered include: problem-solving and computer programming basics; instruction sets, program skeleton, names, variables and numbers; procedures and data frames; and functions and recursion.

In addition to the broadcast lectures, Dr Hellestrand will give two tutorials at the university. The course fee of \$45 covers the broadcast lectures, three hours of tutorials and comprehensive course notes. Transistor radios adjusted to pick up Radio University's special frequency are on sale from the station for \$10 plus postage (or instructions on how to modify your radio are available on request). Cassettes of the complete radio lectures are available for \$81 (with notes).

Radio University has regular

courses on computers and computing. If you're interested in learning more, contact: Radio University, PO Box 1, Kensington 2033; (02) 697 3175. □

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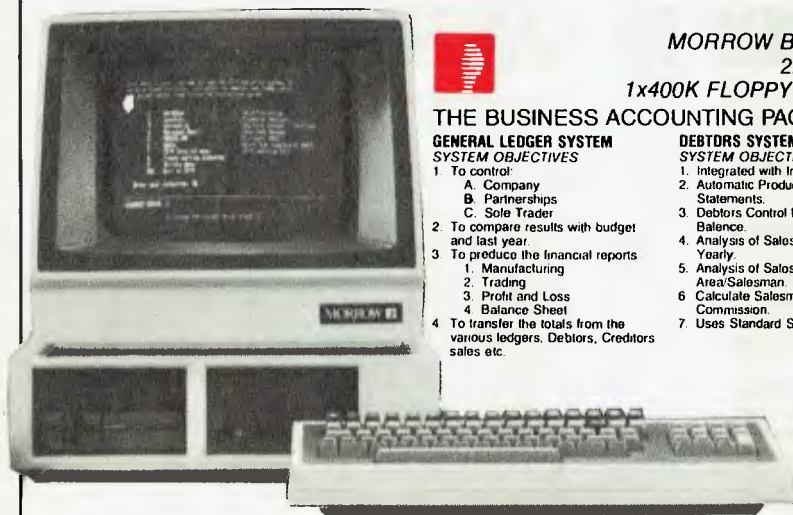
The Melbourne-based Australian Microcomputer Industry Clearinghouse (AMIC) has launched a corporate membership plan targeted at corporations with staff training needs in microcomputing. It is offering a 20 per cent rebate for staff attending workshops, hands-on access to displayed computers at half the normal \$6 hourly rate, a 10 per cent reduction on consultancy, 25 per cent off the hire of training facilities and free orientation for staff groups.

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- To produce salesman and area figures including a commission statement.

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- To produce a creditors system which can operate: Integrated with the Stock System.
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- To control discount available.
- To make payments to selected creditors by the use of the aged Trial Balance.
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- To analyse purchases from creditors month and year to date.
- To produce the necessary totals to transfer to the General Ledger.

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bourne Institute of Technology, AMIC has come a long way in the 20 months since its inception, with membership expanding from 12 to 36 companies. Microsoft has been the latest addition. Companies already represented include Apple, Control Data, IBM, Digital, Hewlett-Packard, ICL and Tandy.

For a fee of \$500, corporate members can get in touch with a comprehensive range of hardware and/or software. Options offered by AMIC include hardware and software demonstrations for \$40 an hour, consultations with qualified Institute staff for \$60 an hour and training programmes for \$45 an hour.

With enrolments exceeding 200 a month, AMIC claims to be one of Victoria's biggest computer training centres. The current workshop timetable lists around 30 subjects, including most of the popular database, word processing, accounting, spreadsheet and integrated packages.

AMIC is located at Gateway Plaza, 449 Swanston Street, Melbourne. For more information contact Peter Wilkinson, (03) 663 6775. □

HP BACKS LOCAL SOFTWARE DEVELOPMENT

In a move aimed at boosting local software production, Hewlett-Packard has launched a software centre in Ringwood, Victoria. The centre, with a budget of around \$2 million dollars a year, will manufacture products for both the local and export markets.

Among its first products is a software package designed to boost the productivity of Australia's 25,000 small manufacturers. It is due to be released before the end of the year and, if it does well on the local market, HP hopes to release it overseas. Also in the pipeline is a 'sophisticated

fourth-generation language' originally developed by local software house BBJ and substantially enhanced by HP.

The centre will employ 40 people, and Hewlett-Packard's \$1.5 million investment will earn it offset credits with the government. □

THE JOB OF YOUR DREAMS?

It's not only *Your Computer's* sub-editors who have had enough (see news item on capital letters). Our minuscule band of hardware and software support specialists (me and him) have decided it's time to get a full-time system support specialist to keep the company's Compupro (and other) microcomputers running happily.

We know there's someone out there who would like nothing better than to spend their time tink-

ering with the latest in high-technology computer equipment *and get paid for it*. If that someone is you, look for the job ads throughout this issue for details. □

VSOFTWAREZ MISSES OUT

In the rush to produce a comprehensive listing of cheap software, we somehow seem to have missed a couple of products from Queensland company Vsoftwarez, which handles software for the VZ200/300. Two of its products which fit into this month's \$25-\$50 category are 'Cash Book Ledger' and 'Editor Assembler', both available on disk for \$25.

More information on products from Vsoftwarez can be obtained by sending a large, self-addressed envelope to: Vsoftwarez, 39 Agnes Street, Toowong 4066. Alternatively, you can ring on (07) 371 3707. □

HACKER'S HEAVEN

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Now we seem to spend more time playing with them than producing the magazine — it's time someone took the job on full-time.

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Qualifications: The only one we really care about is whether you can do the job. The ideal applicant will be a young self-starter, self-reliant with a large dose of commonsense and the ability to think a problem through. He/she would be familiar with Digital Research operating systems and would write in 8086 assembler, C, PL/I, and dBase II. Can't do *all* that? Never mind, neither can the other applicants . . .

Rewards: Meagre. This is publishing, after all. We'll give you lots of fun people to work with, plenty of entertainment, a stack of exciting equipment and enough broad/useful experience to lift your market value substantially. We'll also pay you enough to keep you from starvation. If you want more than that you'll just have to convince us you're worth it. We had in mind negotiating from around \$18,000 but feel free to tell us what you think we should pay you in your application.

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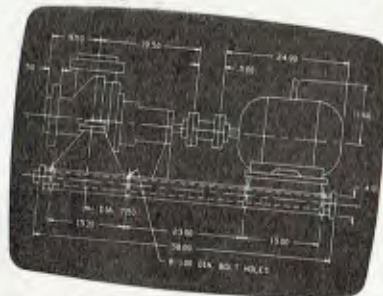
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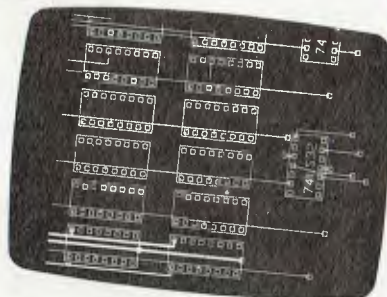
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NEWS

KEEP YOUR CAPITALS TO YOURSELVES

Your Computer's band of sub-editors has decided to get tough with the wanton misuse of capital letters and random punctuation marks. No longer will we tolerate aberrations such as 'WordStar', 'FlashPrint!!' and 'SpeedIt'. From this issue forth, capitals will only appear in the middle of product and company names when they

are grammatically correct (as in acronyms) or when their absence makes a title difficult to read or understand (as in 'Hifinance').

There will be exceptions from time to time for a variety of reasons, the main one probably being editorial whim (who can argue with that?). One such exception is dBase. □

TALK OUR EARS OFF

Your Computer's monthly Synergistic Beer Drinking has been in full swing now since May. A core of regulars, plus a batch of new faces each month, has been coming along to the Clock Hotel in Surry Hills to share an evening of chips and chatter with the leading lights(?) of *Your Computer*.

The June session attracted readers from as far away as Adelaide (well, okay, they didn't exactly *come* to Sydney for the synergy session, but they obviously

thought it was too good to miss). The discussion ranged from using and abusing company cars (the topic of the well-dressed types lounging on the bar) and creating disease databases, to a furious diatribe against Apple from one of our regulars.

If you haven't managed to make it to the Clock so far, why not drop in for the next session: first Wednesday of each month, 6 pm (or so), 470 Crown Street, Surry Hills. □



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BY HOWARD KARTEN

APPLE GETTING
WORMEATEN?

There appears to be a worm — or two, or three — in the Apple these days. Hurt by slowed sales, Apple has been cutting back. As reported here last month, the company dropped the Lisa and laid off staff. More recently, Wall Street analysts pared their estimates of Apple's earnings, the company's stock is off sharply, and there is talk of a possible losing quarter for the first time in Apple's history.

The most recent development — after some executive-suite infighting that seems (forgive us) as American as apple pie — is a major reorganisation of the company. Founder Steve Jobs has apparently been forced to give up day-to-day responsibilities as general manager of the Macin-

tosh division, and the company has been restructured along more traditional lines, with marketing and manufacturing divisions now handling all product lines, rather than separate marketing divisions for each product.

According to some observers, Apple in future will begin to place greater emphasis on technological dazzle. In other words, these observers predict, Apple will become more IBM-like.

Many Apple insiders and watchers are reporting serious infighting between Jobs and president Sculley, who arrived only two years ago after serving as president of Pepsi-Cola. In that position, Sculley undoubtedly was a star student of boardroom tactics, while Jobs is far less skilled in this aspect of business. Indeed, Jobs and Sculley reportedly faced off in late May, when Jobs is said to have proposed to Apple's

board of directors that Sculley be fired. Jobs lost that vote.

There have also been significant shake-ups in top management, most notable of which is that the former head of Apple's operation in France, Jean-Louis Gasse, has been brought to the States to head up Macintosh marketing.

MODEM FOR IBM

IBM has apparently developed a modem that supports simultaneous voice and data transmission, and can also convert text to speech. IBM recently filed papers describing the product with the Federal Communications Commission (FCC) in Washington, although there is no guarantee IBM will market the product.

Taken singly, none of the modem's capabilities is particularly unique. It can operate at either

300 or 1200 baud, both of which are *de facto* US standard speeds. The ability to transmit speech and data simultaneously is not new either, with a few US manufacturers having announced that ability recently. And speech synthesis has been around for a decade or so, with qualities ranging from a heartless, mechanical, science-fiction-like tone to a highly polished voice capable of dealing with abbreviations and inflections. The IBM product would be the first one to combine these qualities, however.

Ever since the break-up of AT&T two years ago left the company free to compete with IBM in computer-related businesses, US observers have been predicting a head-to-head fight between AT&T and the jolly blue giant. Indeed, there are some intriguing similarities between the organisations. Both are renowned as marketing

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masters with strong traditions of excellent customer support — and several executives of AT&T have come from the ranks of IBM. AT&T is marketing its IBM clones, the PC 6300 and PC 7300, here, and the 6300 already has a product called the Communications Manager that supports simultaneous voice and data transmission.

DOES ANYONE REALLY KNOW ABOUT IBM?

Several months before the IBM PC jr made its first appearance, there was a curious incident involving several of this country's newspapers. On successive September days, the *New York Times* and the *Wall Street Journal* — arguably the country's two leading newspapers — printed stories heralding the arrival of the junior.

Breaths were held all over the country, and many expected to see follow-up stories the following day — at the very least, denials by Big Blue.

The follow-up never occurred. IBM is renowned for many things, one of them being to keep its corporate mouth tightly shut, and the general belief was that IBM spokespersons had once again said, simply, "We don't comment on that....", and it was several months after that before the junior made its appearance.

This bit of history has been repeated recently here in the past few months, only this time the star player is the 'IBM PC-2', the alleged successor to IBM's current PC line. Stories have appeared in several segments of the press predicting the arrival of the IBM PC-2 "next Monday/next Tuesday/next week/next month" — one guess seem as good as another (the Real Soon Now syndrome strikes again).

The sources of these leaks are generally believed to be of two sorts. First, there are those within the retail distribution channels — dealers, value-added resellers, and so on. Second, there are consultants of various ilk — individuals consulting to IBM on

issues such as long-term strategy, marketing, manufacturing, technology, supply, market research and the like — who have knowledge of forthcoming projects. The motives of these individuals vary; some are believed to be seeking to force IBM's hand, others undoubtedly are parading their eggs and alleged pipeline to inside information.

Note that the group conspicuously missing from this list is IBM employees. As a group, IBM employees are phenomenally close-mouthed — probably due largely to very high levels of employee loyalty, and only secondarily to IBM's efficient security staff.

One can guess at the existence of a third factor as well, and that is the principle of compartmentalisation. IBM is well aware that perhaps more than any other company, its employees, as a group, are bright, energetic, motivated — and ambitious. (Consider, for example, how many other computer companies are headed by, or were started by, ex-IBMers.) It is fairly well-known here that different groups within IBM are always competing against each other when it comes to developing new technology — so one can make a reasonable guess that compartmentalisation and information dissemination only on a 'need to know' basis are also at work.

All of this means there are arguably very few non-IBMers who know definitively what IBM will do, and even within IBM ranks, not more than a handful of people involved in planning strategy and making announcement plans.

In any case, the bottom line for the PC-2, for this week at least, is that it's been put on hold. Maybe. An analyst for the Wall Street brokerage house Paine Webber last week issued a report, 'The PC-2 Mirage', claiming that the computer is being re-evaluated — one of the moves apparently instituted by the recently installed management team in Boca Raton.

Stay tuned, though. There'll probably be a whole new crop of rumours next month. □

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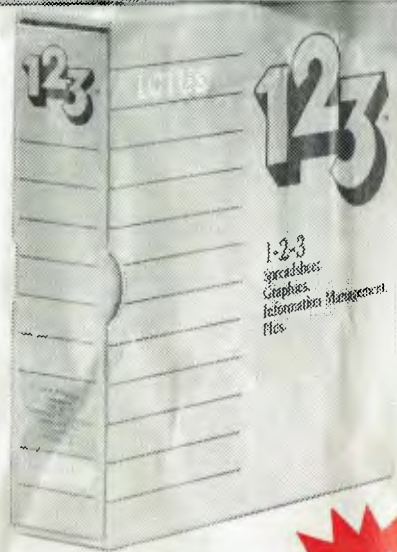
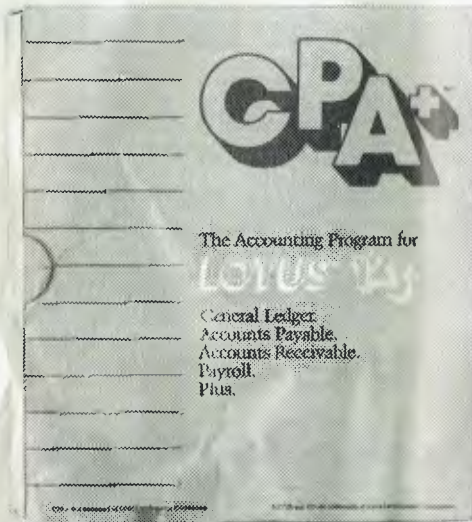
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COMPUTING ON THE CHEAP



Frank Lee dons his brown paper overcoat for a stroll down Cheapside Lane, hoping his Ritzy friends with PCs won't recognise him or the El Cheapo Micro tucked beneath his arm.

Computing on the Cheap

I guess I've been spoiled. Working in the computer industry one becomes somewhat nonchalant about expensive computing gear. And if you've been in the game for as long as I have, your first machines would have been very, very pricy. Far too pricy to be owned by an individual, or even a small business.

Having in recent years taken the quantum leap from the huge to the personal computer, I now find myself on the brink of yet another existential leap — this time from the 'respectable' PC to the not-so-respectable 'cheap' computer.

I've always had a healthy disrespect for cheap computers — nasty little plastic things with infuriatingly sophisticated graphics, brilliant programs, and addictive games. Naturally they're only good for games. Or are they?

I seem to recall similar disparaging remarks made about the early microcomputers. That was fair enough; they were more often than not based on audio cassettes, and needed the 'toggling in' of a binary bootstrap program to start things going. There was precious little software, and that which was available was primitive by today's standards.

Today, those microcomputers have caught up to and frequently surpass the minis of the late '70s. This article is being written on my favourite PC, Ron, who sports half a megabyte of main memory; that's eight times bigger than many data processing engines of a decade ago. I suspect a similar evolution has been at work at the current low-price end of the market.

Four Cheapies

This month we take a curious look at four 'cheap' machines: the new AWA Amstrad CPC664 with built-in microdisk drive; the John Sands Sega (also with disk drive); the Sinclair QL (Quantum Leap) with microdrives; and the Microbee 'Computer-in-a-Book'.

When 'reasonably' configured, none of these machines exceeds \$1500 in purchase price (tax included), although the provision of a printer could up that cost by about \$400. All have as much main memory as the maximum found in the earliest micros. Their graphics are generally superior to 'normal' personal computers, since they employ special-purpose hardware designed for that job.

More importantly, they now have much improved functionality. If software sells hardware, then these little wonders should

I've always had a healthy disrespect for cheap computers — nasty little plastic things with infuriatingly sophisticated graphics, brilliant programs, and addictive games. Naturally they're only good for games. Or are they?

outsell hot cakes. Although they were first and foremost sophisticated game-playing machines, their scope has broadened considerably. We now see spreadsheets, word processors, simple database systems, and more programming languages. Some now offer the CP/M (eight-bit) operating system, which again expands the range of applications programs.

There are certain penalties for 'going cheap'; you still don't get something for nothing. But you sure get a lot for a little. In fact it reminds me of a wisecrack I made a few years back — a prediction that in the not too distant future, kids will be collecting and swapping components included as premiums in packets of breakfast cereal. When you've got the complete set you put it all together — and behold! a computer. Naturally, you'll then have to buy all your software from the cereal manufacturer. Who knows? Byte-sized software with added vitamins from KellySoft or SaniSoft?

The John Sands Sega SC3000H

Manufactured by Japanese Sega Enterprises, the John Sands Sega is a low-cost Z80A-based machine. Like the rest of the small machines reviewed in this article, the base machine is contained entirely in its standard qwerty keyboard housing. This compact unit measures 35 cm by 21 cm and is just 5 cm deep. Of the 64 keys, four are set in a diamond cursor-control cluster (uncomfortably) close to one labelled 'Reset'. A slot on the side accommodates either ROM cartridges or a connector to

the optional SF7000 'Super Control Station' with greatly increased input/output capabilities. The 'H' model differs from the earlier SC3000 in having 'real' typewriter keys instead of 'chiclets' or 'soft' keys.

The Sega is externally powered from a 9 volts DC transformer/converter which connects to the rear of the keyboard. The other features on the rear of the keyboard are:

- a VHF TV output signal (for our channels 3 or 8)
- a switch to select which TV channel to use
- a five-pin DIN 'video' connector
- a seven-pin DIN 'printer' connection
- two RCA connectors for the separate data cassette recorder.

Two nine-pin joystick sockets are located on the left side of the keyboard.

Setting the system going with a regular colour TV was a cinch. Trial and error revealed the two channels, and both worked fine. Sound was generated through the TV as well, and 16 colours are possible with the advanced BASIC.

After wasting the statutory hour playing ROM-based games like Borderline, Exerion, Sinbad Mystery and Safari Race, I plugged in the BASIC ROM pack. This is a greatly enhanced BASIC complete with up to 32 sprites and three-channel sound generation. Source text may be edited on-screen with the same methods used on the IBM PC.

The optional SR1000 data cassette recorder also requires an external DC power supply, this time 6 volts. By the time everything is connected you have a veritable rat's nest of cabling — the common penalty for using low-cost equipment for doing 'real' jobs.

I early learned a healthy distaste for cassette data storage; it's slow, and not particularly reliable, but its real drawback is that tape is intrinsically a serial medium. If you store more than three or four files on a tape, it can take ages simply to reach the one you want. When you've been spoiled with floppy disks you tend to appreciate direct access systems.

I managed to load a couple of demonstration programs, but not without the usual 'bad read' problems.

The SF7000 expansion box adds a 7.5 cm compact single-head microfloppy disk drive, with 160 Kbytes per side. It also brings the total RAM capacity to 80 Kbytes. The expansion box is roughly the same size as the keyboard, but the cable connecting

Computing on the Cheap



the box to the keyboard is just too short for it to sit beneath the TV receiver. As a result, the keyboard must sit atop the expansion box, with the TV perched on a pile of books behind. All a bit awkward, but nevertheless workable.

Also part of the expansion box is an RS232C port and a 14-pin Centronics port, which with a special cable allows the use of regular parallel printers.

The Sega documentation is a bit like the curate's egg: good in parts. Some is still in its quaint original jinglish. This is the case with the important technical manual describing the Super Control Station, the HuCal spreadsheet software, and Sega Logo. John Sands has done a first-rate job in rewriting the BASIC programming manual.

In spite of the curious language, the

manuals make sense, and are a mine of information. Rather surprisingly, the Super Control Station manual contains most of the technical information applicable to the SC3000H itself. There are pin-out diagrams for the video and printer ports and details about the disk storage system (hardware and software).

A separate booklet contains listings of numerous BASIC programs designed to show off the special features of the Sega.

I tried the supplied Epson RX-80 F/T printer on the parallel port. The software makes good use of the Epson's graphics facilities, and produces quite acceptable results in normal text mode. Segaword is worth an article on its own.

John Sands is reported to have negotiated with an Australian company to make available a new disk operating system (cal-

led SegaDOS 2) with full CP/M 2 compatibility. This should greatly improve the number of software offerings, and will retail for \$99. The Melbourne authors claim it is based heavily on the public domain ZCPR — an enhanced version of CP/M's CCP (Console Command Processor), but with an entirely new BDOS (Basic Disk Operating System) and BIOS (Basic Input/Output System). It has been tested with dBase II, Multiplan and Wordstar.

Some of the software manages quite well without an operating system at all. Examples are HuCal, Sega Base and Sega Logo; these disks self-boot. Other application software (such as Segaword and Segadraw) need the prior loading of the BASIC system disk.

I spent some time messing about with both HuCal and Logo. HuCal is easy to ▶

Computing on the Cheap



move into, and has a useful help system. Spreadsheets on eight-bit machines are naturally limited by the amount of memory available, but the code for HuCal is relatively small, leaving about 19 Kbytes for the workspace.

Logo was far more interesting. This is a very good implementation of the language, and even offers recursive procedures. The graphics facilities are first-rate and extensive.

Sega Base is a simple database system using 254 byte records (one per sector for direct access). I gave it a miss since the manual had been omitted from the package sent for review. However, a simple calculation shows you can expect a maximum of roughly 600 records on a single disk side, exclusive of related indexes.

Prices for the SC3000H system start at a recommended \$349 for the basic computer with 48 Kbytes of RAM, 32 Kbytes of ROM,

BASIC Level IIIB ROM cartridge, cables, AC power adaptor and manual. The SF7000 Super Control Station adds another \$599 to the total. The data cassette recorder is \$99, and the ROM game cartridges are generally under \$40 each.

John Sands is planning the early release of a business package complete with three different business programs for \$1275. That's without a printer, of course, but hard to beat. The package consists of the SC3000H computer, the SF7000 Super Control Station, a 30 cm green-screen monitor, and a computer education course. The software consists of the spreadsheet HuCal, a business package called Cashbook, and the word processor Segaword 3. It's claimed Cashbook accepts sales and cash receipts, allocates cash disbursements to expense categories, and helps prepare bank reconciliations, sales and expense journals, and income state-

ments. And, of course, it's a tax deduction!

Also in the Around The Corner category is the Micromodem 3, which with the Segacom ROM cartridge allows you to access your favourite bulletin boards as well as commercial Viatel systems.

The AWA Amstrad CPC664

The British-manufactured CPC664 is another 4 MHz Z80A-based machine with a full 64 Kbytes of RAM in the basic unit. The keyboard is unusually long; on the left is the normal qwerty layout, to its right is a numeric keypad (which doubles as a function pad as well), above which is a cursor control diamond. On the extreme right is an integral 7.5 cm microfloppy disk drive. The drives are single-sided, and each side of a disk can store 180 Kbytes on 40 tracks. Each track has nine 512 byte sectors.

Hidden on the right side of the unit is a volume control and power switch. The rear

Computing on the Cheap



of the unit has three edge connectors — one for a second disk drive, one for an expansion unit, and another for a parallel printer. There is also a five-pin DIN connector for an audio cassette tape, a nine-pin joystick connector (it seems to accept Sega joysticks as well), and a 3 mm stereo socket. This latter can be programmed for left, right and centre sounds. The sound controller chip is the GI AY-3-8912 with three voices. There is a six-pin DIN socket for either a monochrome or RGB monitor, and a socket for an external 5 volt DC power source (derived from the monitor). A flying lead from the rear of the unit connects into a corresponding socket on the monitor for 12 volts DC.

The 64 Kbyte dynamic RAM is refreshed by accesses to screen memory (the top 16 Kbytes). A 6845 CRT controller generates scanning signals for the video RAM, while 32 Kbytes of ROM contain the operating

system and BASIC. The screen has three resolution modes:

- 40 by 24 with four colours of text, or 320 by 200 pixels, each of four colours.
- 20 by 25 with 16 text colours, or 160 by 200 pixels, also 16 colours.
- High-resolution mode with only two colours, 80 by 25 for text, 640 by 200 pixels

When first powered up, the system enters its ROM BASIC. Non-CP/M programs supplied on disk may be loaded with a RUN DISK command. These disks contain a DISK.BAS file which boots the required software. CP/M itself may be loaded with the command |CPM. Thereafter you respond to the usual A> prompt.

The BASIC is powerful, and even has real-time facilities for responding to interrupts. For example, the EVERY 500, 2

GOSUB 50 statement will cause the subroutine at line 50 to execute each time interval timer 2 passes through a multiple of 500. Other facilities allow use of the peripherals (for example, PRINT #8 sends a linefeed to the parallel printer), screen graphics control and sound generation.

Many of the application packages (and there are many) require CP/M. Once CP/M has control of the machine, programs are loaded by entering the filename (less the .COM file type) as usual.

On the flip side of CP/M is DR Logo, which is a fun educational tool with considerable processing power.

There is actually a wealth of business-oriented software available under the AmSoft label. An example is Microscript — a basic word processor with a simple and elegant command structure.

Approximate recommended retail prices for the CPC664 are as follows: with a ►

Computing on the Cheap



green-screen monitor — \$800; with RGB monitor — \$1000. A second disk drive costs \$300, and would be a good investment. Spare disks run to \$80 for a box of 10. The joystick is \$20, and a printer cable \$40. Software prices vary from about \$25 for disk-based games up to \$311.85 for an integrated accounting package. The CP/M-based word processor Microscript is \$158.95.

The Microworld Microbee Series 3 'Computer in a Book'

This school favourite Z80A machine also sports 64 Kbytes of RAM and runs CP/M as well as self-loading programs. The keyboard is about the same size as that of the Sega, measuring 35 cm by 23 cm by 6 cm deep. There are no cursor control keys. A Reset key is located in a dangerously accessible location at the lower right corner. Fortunately, the key is timed, so it is

ineffective unless depressed for a second or so.

Although the keyboard is small, it has a healthy feel, and the key separation feels standard enough. A typist might be able to adapt to it, although the light weight of the unit could be a problem.

The machine is complete with a standard RS232C serial port and a non-standard parallel port requiring a special cable to match the Centronics interface on most printers. The review unit was the monochrome version (an RGB version is also available). The amber monitor is driven by a composite video signal emerging from the rear of the computer. The cute twist is the 'computer in a book' idea. An external 9 cm microfloppy disk drive is supplied in a 27 cm by 24 cm by 7 cm fabric-covered cardboard box. The front of the drive peeks out from the 'spine' of the book, which is designed to sit vertically

alongside the monitor. The 'book' interfaces to the computer's expansion port via a flat cable. The system, including the monitor with adjustable stand, has a recommended retail price of \$1115.

Under CP/M, the STAT DSK: command reveals that each disk has 390 Kbytes capacity with 128 byte sectors. There are (as usual) two reserved tracks for the system. The directory chews up 32 sectors, and with 40 sectors per track, there must be 78 tracks in all.

Being authored in Australia, the Microbee documentation is decidedly readable (a change from Jenglish). Unfortunately the manual is quite thin (65 pages) and lacks an index. It also requires a separate three-ring binder (not provided). Judging from the page separators, I would say quite a bit was omitted from the package. There was nothing on the communications program, or any details about the main parts of

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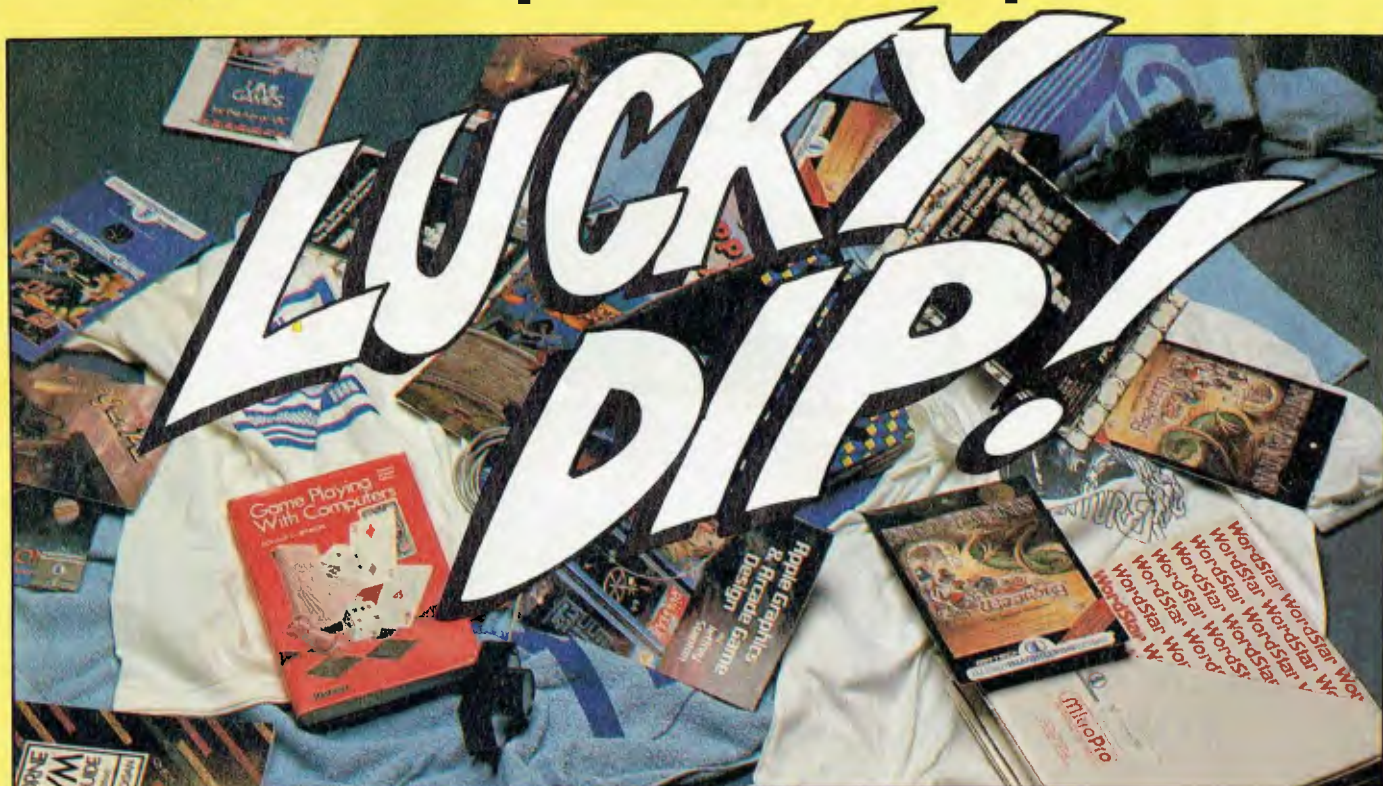
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BASIC, or the differences between disk BASIC and ROM BASIC.

On powering up with the supplied CIAB system master disk, a high-resolution menu offers the following selections:

- Microworld disk BASIC
- Microworld ROM BASIC
- Wordbee word processor
- Telcom communications
- Diskette manager
- System setup
- Return to CP/M.

Disk BASIC allows the user to save and retrieve programs or data to/from diskettes. The manual details the associated additional statements (such as OPEN and CLOSE). In other respects, the interpreter is the same as standard Microworld BASIC (for which the documentation was not supplied).

ROM BASIC allows one to emulate exactly a cassette-based Microbee under the disk system; this version doesn't support disk files. Once loaded, the Microbee thinks it is a 32 Kbyte machine with BASIC in ROM.

Wordbee is the *de facto* word processor for the Microbee. It is particularly easy to master, and the added disk feature makes it a practical proposition. Many of Wordstar's control code have been implemented — such as ↑I, which gives excellent help, and makes a manual almost redundant.

Telcom is a neat modem communications package with facilities for modifying the communications parameters. It has many of the features of Modem7, a popular public domain system which follows the Christensen protocol for file transfer. Automatic dialling is supported, as is control of station status (answer or originate) if the modem supports these controls. A modem is available for \$189.50. Since this includes Viatel and Teletex abilities, this is particularly inexpensive. The software for Viatel retails for \$49.50 — that's a real bargain.

The diskette manager option presents a menu-driven file handler to isolate the user from the nasties of CP/M. Facilities include backing up of diskettes, file copying, directory display, file erasure, diskette formatting, and putting the system onto a new diskette.

The system setup option allows adjustment of the screen window and its colours, printer configuration, disk drive configura-

I early learned a healthy distaste for cassette data storage; it's slow, and not particularly reliable, but its real drawback is that tape is intrinsically a serial medium. If you store more than three or four files on a tape, it can take ages simply to reach the one you want.

tion, and the setting up of an automatic command on cold boot.

The Wordstar Professional Pack is available separately for the Microbee, and costs just \$169.50. Also available are Multiplan and Microsoft BASIC, but prices are 'POA'. A second disk drive (drive B under CP/M) is available as 'Computer-in-a-Book Volume 2' for \$345.

The review machine arrived with no less than 11 diskettes. The majority were self-loading programs, some educational, some just good clean fun.

One disk, labelled 'Strategic Games', included nine very neat offerings from Honeysoft — the programming division of Applied Technology. One of these games is entitled 'Sydney Approach', in which the player acts the part of an airline controller at Sydney Airport. The display represents the coded radar screen, and shows planes arriving and requesting departure. The idea is to bring the incoming aircraft over the approach marker beacon just in front of runway 16 at a proper heading and altitude. Departing aircraft must be 'handed over' to other controllers as they pass their assigned destination beacons. As I say, it's all good clean fun, except that I'm a sucker for this kind of game.

The ninth offering on this disk is good old Eliza — the dumb psychiatrist who plays transactional analysis with you without ever saying anything meaningful. There is also a version of John Conway's 'game' of life — a popular cellular automaton made famous some years ago by

Scientific American.

Most of the disk-based games and educational programs run to \$29.50 per disk. Blank disks cost you \$9.75 each — quite pricey compared with 'normal' 13 cm disks.

The Microbee has been a great seller ever since its release in February 1982, and has also made export kills in Scandinavia and Israel. There are many Australian schools with Microbee learning laboratories, and those who use them have been quick to praise the company behind the product.

Microbee products are marketed by a small group of dealers, company stores, and direct to schools. The two-volume Computer-in-a-Book can be used as the master controller in a school's Beenet system. Schools with original Microbees may upgrade to Computer-in-a-Book for \$495. An upgrade to colour costs \$135, but you need to supply your own RGB monitor.

Bouquets to Owen Hill and the folk at Gosford.

The Sinclair QL

Unlike the previous three machines, the British Sinclair uses a 68008 rather than a Z80, but this little detail is buried deep inside the voluminous User Guide. The operating system is QDOS, although the User Guide gives only sketchy details about it. The keyboard unit is a lightweight 48 cm by 14 cm by 5 cm deep. To the left of the standard qwerty keyboard layout is a column of five function keys, while to the right of the keyboard is the housing for two 'microdrives'. The keys have a very light touch, perhaps too light for an experienced typist, and there is no tactile or acoustic feedback from keystrokes.

Whereas the previous three machines used microfloppy disks, the QL uses tiny closed-loop cassettes measuring just 34 by 44 by 7 mm. The QL is supplied with eight cassettes, four blank, and four containing 'integrated' packages from Psion called Quill, Abacus, Archive, and Easel.

The microdrive cassettes or 'cartridges' can each store 100 Kbytes. Each cartridge must be formatted before use — just like a floppy disk. The formatting process records up to 255 sectors, each of 512 bytes. The directory flags bad sectors, and the number of usable sectors is reported after formatting. The cartridge contains a 508 cm loop of high-quality video tape which moves at approximately 71 cm per second. This means the tape completes one loop in 7.5 seconds, and the formatting process ▶

takes four passes of the loop to complete its recording and verification. A cartridge can be write-protected by removing a small lug.

These cartridges must be handled with great delicacy. The Guide warns that you should never move the computer with a cartridge installed — even if it is turned off!

The QL sports a total memory capacity of 256 Kbytes, of which 48 Kbytes are system ROM. Another 16 Kbytes are reserved for pluggable ROMs, and the remainder is all RAM. Thirty-two Kbytes of RAM are dedicated to input/output buffers; another 32 Kbytes contain the screen RAM. This leaves 96 Kbytes for the user's main RAM; additional RAM may be added (up to 720 Kbytes) externally. The 68008 can directly access up to 1 Mbyte of memory, and it's very fast. Sound generation is controlled by an 8049 processor which acts in parallel with the CPU.

The approach taken by the User Guide suggests this is a 'serious' machine, not a toy. There were no supplied games, nor any glossy material extolling domestic software. Indeed the User Guide is a storehouse of valuable information revealing the real power of the system, and the application programs are intended for small business purposes.

Putting the unit together is very easy. One has the option of driving a domestic television set through UHF Channel 36, an RGB monitor, a composite monochrome monitor, or a composite PAL (colour) monitor. Not having the necessary cables to support the monitors, I used the UHF system. Frankly, I found this extremely difficult to read. My system was prone to interacting with external RFI, and the 80-column screen required more definition than was reasonable to expect from a domestic receiver. On the other hand, programs written in BASIC allow the setting of character and window size to be adjusted to readable proportions.

A rather bulky external power supply provides the computer's required DC voltage levels. It is supplied without a power plug, so you'll need to attach your own — which is a neat way of avoiding the hassles of international marketing.

Other back connections include two network connectors (in and out), two serial ports, two joystick controls, and a socket for a ROM cartridge.

On the right side of the computer is a reset button and a microdrive expansion

The Microbee has been a great seller ever since its release in February 1982, and has also made export kills in Scandinavia and Israel. Many Australian schools have Microbee learning laboratories, and those who use them have been quick to praise the company behind the product. Bouquets to Owen Hill and the folk at Gosford.

slot. A peripheral expansion slot is located on the left side of the computer.

When power is applied, the display presents a menu with two options: monitor or TV. If the monitor is selected, the screen size is adjusted to suit the higher-resolution display. This involves three separate areas (or channels); in the television mode there are only two areas. The thin window at the bottom of the screen is used to display typed commands.

The screen may be in either 512 mode (512 by 256 pixels) or 256 mode (256 by 256 pixels). In the high-resolution mode only the colours black, white, red and green may be displayed; in low-resolution the number of colours is doubled.

The commands available are those appropriate to the QDOS operating system, or to the ROM-based SuperBASIC. This version of BASIC is one of the most powerful I have ever used. It supports structured programming concepts, including procedures with internal local variables. Unfortunately, because of its extensive syntax, it is necessary to use the LET keyword in assignment statements. However, this is a minor price to pay for the power of the language. Its graphics and sound facilities are also very extensive, and there is even a Logo-like turtle facility included.

The User Guide is broken up into the following sections:

- Introduction
- Beginners' Guide
- Keywords
- Concepts
- QL Quill (the word processor)
- QL Abacus (spreadsheet)
- QL Archive (database)
- QL Easel (graphics).

The 11-page introduction deals with setting up the machine and using the microdrives. The 110-page Beginners' Guide is a tutorial on SuperBASIC with self-testing quizzes; even experienced BASIC hacks should read this once since there are many differences from 'normal' BASIC.

The Keywords section is a reference list of all the BASIC and QDOS commands. This too is worth close inspection — at least once.

The Concepts section is the meat of the manual. Here you will find an answer to almost any query about the system or its software. It is especially useful for someone intending to write software in BASIC, or if you wish to attach peripherals.

The four application programs may exchange data through the commands IMPORT and EXPORT. The second microdrive can be used to hold the exchanged data.

All the applications have a similar interface, and all assume an 80-column screen. I found this very difficult to use on my domestic receiver, so I looked up monitors (in the Concepts section) and discovered the pinout diagram for the multi-purpose video socket. After a little fiddling, I managed to display a monochrome version on my green-screen display using the signal from pin 3. This worked just fine. Much more effort was required to hook the RGB signals (and sync) into my RGB monitor, but the effect was superb.

The Sinclair QL in its basic configuration will knock you back \$1095.

In Summary

Now these four 'tiny' machines have vacated Mount Crisis, I have recovered a spare room; when boxed, they are collectively voluminous. In a way, now I'm pounding Ron again, I miss the elegance of those little blighters. Yes, I'm tempted to add one or two to the stable. Which one or two? I don't know — but I must say the Sinclair QL looks decidedly promising. We'll see. No doubt I'll be influenced by Number One Son, who is claiming to have outgrown his Apple II.

See you in the spring. □

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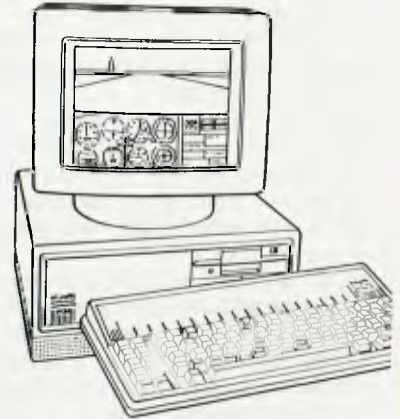
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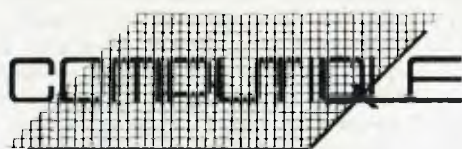
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OLIVETTI (M24) wins the outright performance stakes by a healthy margin. (*Today's Computers*, June 1985)
Enable - Head and shoulders above the rest. (*Today's Computers*, June 1985)

ENABLE - By far the better system. (*A.P.C.*, May 1985)
M24 - You want the best in the IBM stable? M24 fits this category perfectly. (*Your Computer*, April 1985)

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CHEAP SOLUTIONS

My homily on cheap computers (elsewhere in this issue) describes a number of low-cost machines with recently enhanced capabilities. Most have a tape-oriented background, although we noted a trend towards the use of microfloppy disk drives, and a unique tape loop system as used on the Sinclair QL.

Is it now time to test these engines in the real world of office automation? It seems so. None of the machines reviewed ran in excess of \$1500 when 'reasonably' configured. For under \$2000, you get a printer thrown in as well.

But soft! We travel too fast, methinks. Some of our small business readers probably just collapsed at the thought of dollars running into four figures. Let's, as they say in the song, start at the very beginning.

The primary marketing thrust in the 'home' computer arena has been towards entertainment and education. A sprinkling of 'domestic' application programs adds a flavouring of 'usefulness' to the menu; a few simple card file programs, telephone lists and cheque book balancers were the staple fare following the entertainment and educational entree. The limiting factor in such applications has been the storage medium — not the power of the CPU or the available memory.

The fact is that most 'real' computer applications deal with stored files. These may be stored on one of two types of storage device: serial or direct access. Cassette tape is the classic serial storage medium for microcomputers, while diskettes (of varying sizes) offer direct access. In other words, a program can quickly reach any record in a direct access file to allow it to be read or updated. If those records are stored on tape, then all the records between the record presently at the read head position and the required record must be bypassed in sequence. Hence the term 'serial' or 'sequential' storage. Clearly direct access offers real speed advantages for programs dealing with large files.

Historically, many early data processing machines were restricted to magnetic tape — a strictly serial access storage mechanism. And they got by. By examining how this was done we may well learn how similarly constrained small computers can cope with meaningful applications. An example was the Bendix G-15D. Two of these

Cheapskate Frank Lee asks whether a \$500 to \$1000 tape-based machine can do a job (any job?) for a small business on a tight budget. What's the next step? And what are the options now open to the budget-conscious?

were used in AWA's data processing division in the early '60s. Each had four (very slow) magnetic tape drives, and there was no direct access storage, but it looked after plant control, engineering design and certain accounting functions. It can be done.

Whatever the application or the storage mechanism, there are just three basic data processing operations. These are file creation, file maintenance, and file usage.

File Creation

This is generally a once-only exercise in which a file (such as a mailing list) is initially created. If direct access devices are to be used, there is no constraint to enter the raw data in a preferred order since direct access devices make subsequent sorting a piece of cake.

Conversely, sorting on magnetic tapes is a slow process, and requires at least two tape drives to do a reasonable job; three drives are even better. Since we're talking about home computers with normally just one data cassette, the sorting of files of any reasonable length is not really practicable unless a second drive is available. As a result, it is important to arrange the source data in the required sequence before entering it through the keyboard.

File Maintenance

A similar problem is encountered when trying to update or modify an existing file on tape. It is not normally feasible to select and overwrite a record on a tape since there is a danger of the writing process

spilling over to adjacent records. The normal approach is to perform a 'sequential file update'. This involves creating a new sorted (updated) file using the original file and a 'variations' file containing data for the additional records, records to be removed, and changes to existing records. This variations file must be stored in the same record order as the original data file.

The program which performs the update therefore needs three separate tape drives, and again we're stuck with one drive on most domestic computers. In any event, it forces one into 'batch' mode operation in which the computer is left to do the update exercise as a standalone task. This is in contrast to updating a direct access file by zapping individual records in any order at all.

File Usage

Using the file generally requires one or more passes through the file to create reports or to answer queries. This is certainly amenable to small machines with just one tape drive, although answering *ad hoc* queries might take some time as the tape is searched for the required records.

Can it be done?

On the face of it, it doesn't look too good for home computers with a single tape drive. But all is not lost. Ever hear of 'virtual disk'? That's when part of your main memory (RAM) is treated as if it were a small, fast, direct access 'disk'. This is standard fare for most 16-bit machines.

RAM has become surprisingly cheap; it now retails for less than \$1 per Kbyte. If your computer architecture and operating system can cope with virtual disk, you have a fighting chance. Unfortunately, the most popular home computer CPU remains the trusty old eight-bit Z80A. It is normally imprisoned in a 64 Kbyte cage, which leaves little room for virtual disks. Of the four basic computers reviewed, only the Sinclair QL had more than 64 Kbytes of RAM (96 Kbytes are available for user programs and data). This machine also supports two separate tape drives, so even in its base form, it has considerable 'real' processing capacity. The Sega RAM is increased to 80 Kbytes by the addition of the 'Super Control Station'.

Even without an operating system-supported virtual disk system, good old

Cheap Solutions



BASIC can help you out with a suitable string array into which data can be read as if it were a disk. The problem here is again the maximum size of the array, and therefore the maximum file size.

With virtual disk or BASIC arrays, you can read an entire file from the tape to the 'disk', sort it according to a key, then write it back to the tape. In fact, once the file is in your internal array, you can treat it just like a direct access file since each record is stashed in a numbered element. The element index becomes the record key. If the file has been modified in the process, you can rewind the tape, then dump the array back over the original file. Frankly, I would use another tape altogether to avoid an unrecoverable situation which could occur from (say) a short power outage.

Limitations of Tape-based Systems

The real limitations are:

- Hardware reliability
- Number of tape drives
- Capacity of the drives
- Usable RAM space.

Note that speed is not really critical; all computers are fast. But if you can organise your work into jobs which can be left to themselves (such as the sequential file update), even tape speed becomes relatively unimportant. This is what is meant by 'batch processing'.

Using the Sinclair QL as an example, and assuming we want to treat the tapes as strictly serial access devices (they are

somewhat more than that), one could first read the (presumably short) variations file into a BASIC array, then load the old file into one drive, and a blank (formatted) tape into the second drive. The update program could then look after the exercise while you go make yourself a cup of coffee. The BASIC array would be doubling up as a third drive.

Unfortunately, without disks, none of the other machines is really up to this performance without hardware enhancement. In practice you will be limited to files considerably less than 32 Kbytes long, since the workspace will be also required for the data processing program. Thirty-two Kbyte files would limit a practical mailing list file to roughly 250 records. By comparison, a typical bulk mailing exercise for a small firm could run to many thousands of such records.

Nevertheless, if your file requirements are considerably less than 32 Kbytes, there is a very good chance a simple cassette-based Z80 machine could be programmed to do the processing.

Before moving on to hardware enhancements, a word of warning is appropriate: cassette tapes are notoriously unreliable. You may be faced with frequent re-runs of important jobs as a result of badly written files. You will need to make backups of important tapes (again via internal RAM buffers) to safeguard your data investment, and the backup procedures will be slow — very slow.

My guess is that the erratic performance of tapes, and the fiddly messing around with them, would force any normal healthy

business person to start thinking about upgrading to a disk system. Indeed, perhaps the right time to make this move is *before* you buy the tape system and invest considerable effort in programs which may quickly become obsolete.

Other limitations of some home computers are the quality of the display, keyboard, and communications facilities. You should not consider using a TV receiver as the principal display device. They simply do not have enough resolution to display 80-column lines — especially in colour. You should invest in either a monochrome display, or an appropriate (and expensive) colour display. Most software will work just as well in mono.

The keyboard quality is also important if it is intended to use the machine for extended data entry applications. Separate cursor control keys are worthwhile, as is a numeric keypad.

A serial interface (common on most enhanced machines) is very desirable, since one of the most useful applications is the accessing of remote databases, or videotex systems. You would need to purchase a separate modem with videotex facilities, and the appropriate software. A good example is the Microbee's Beemodem and software. External modems can be interfaced to the computer if it has a standard serial RS232 interface. A modem with autodial facilities makes using the telephone a delight.

Enhanced Home Computers

Some home computers, such as the Sega and Microbee, started life as ROM and/or ▶

Cheap Solutions

cassette systems. As the review article shows, these two machines can be upgraded by the addition of microfloppy disk drives. The Amstrad CPC664 is already equipped with a microdrive, but its predecessor — the CPC464 — can also be upgraded to disk with the addition of an external drive. The Sinclair QL is in a class of its own, since the twin microcassette drives behave to all intents and purposes like direct access (albeit slightly slow) disk drives. It is therefore wrong to think of the QL as a sequential tape machine. Its 508 cm tape loop cycles completely in just 7.5 seconds, giving an average record access time of 3.75 seconds.

As we saw, none of these enhanced machines exceeds \$1500 once all the required goodies have been hung on. Some are just above the \$1000 mark. No doubt as time goes on, these prices will drop — if past experience is anything to go by. But if your need is now, don't sit around waiting for a price war. In business, time is money. And the whole idea of the computer is to save you time, and hence money.

My guess is that the erratic performance of tapes, and the fiddly messing around with them, would force any normal healthy business person to start thinking about upgrading to a disk system.

Most users will also need to outlay money for a printer. I would suggest the purchase of a low-cost daisywheel printer, since this can serve to create regular business letters, form letters, and the various reports. Although the daisywheel system is slower than dot matrix, it has a far more 'professional' appearance for letter writ-

ing. Printers may set you back anywhere from \$400 to \$2500 depending on speed, facilities and reliability. I have used a Uchida mechanism (in the guise of the Letter Writer SP 2000) for two years without complaint.

So now let's address the question about the processing capabilities of these enhanced machines.

The 7.5 cm disk drives used by the Sega and Amstrad provide direct access storage capacity of roughly 180 Kbytes per side, while the 9 cm Sony double-sided disks used by the Microbee provide a total of 390 Kbytes each. The two Sinclair QL microdrives provide 100 Kbytes each.

These capacities are probably adequate for most 'real' small business applications such as accounting, inventory, word processing or spreadsheets. However, most users will soon start to hanker for a second drive if their enhanced machine has only one to start with. A second drive makes disk backup a breeze; this alone is an adequate reason to make this investment. It also means you can assign one drive to

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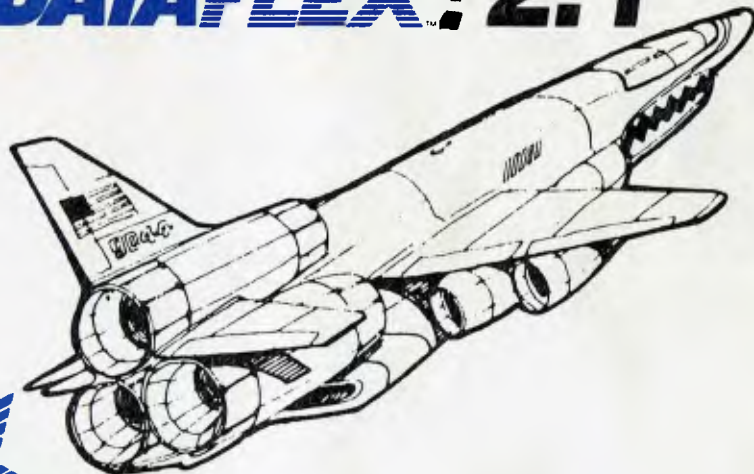
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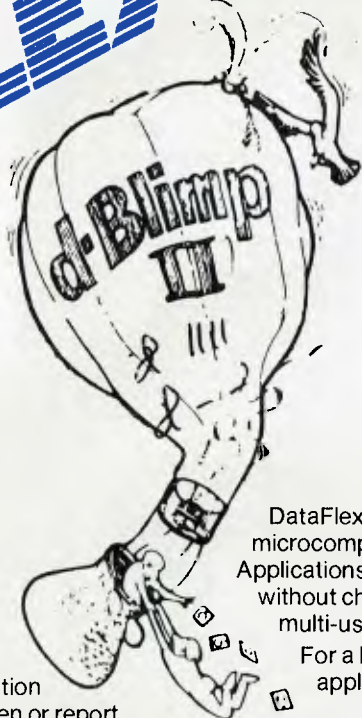
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your programs, the other to data files. In 'real' installations, single-drive systems are a 'no-no'. An example of such an enhancement would be the Microbee Computer-in-a-Book Volume 2.

Since CP/M (or a close lookalike) is available for most Z80 systems with disks, you then have access to a wealth of worthwhile software, much of it in the public domain. You may be able to use the traditional word processing workhorse Wordstar without too much installation trouble, and dBase II, DR Logo, Pascal and other goodies may also become available to you, although you will be dependent on your computer supplier to provide you with the software in the proper format for your disk drives.

What would it be like using (say) a twin-drive Microbee with a monochrome display and daisywheel printer? If you're not over-concerned with elegance, or with a maze of cables cluttering the desk, or with a plastic-feeling keyboard, then you'll probably squeeze a lot of honey out of this system. Here are just a few potential applications:

- On the desk of a spare parts retail outlet providing an inventory system. The sales people should be able to locate the item by description. The system would provide the number in stock, the price, and the bin location. After hours, a reordering run could generate orders for parts which have fallen below critical level.
- A similar system could record sales, both cash and credit.
- A mail order business could maintain mailing lists for different customer categories, and generate customised form letters for bulk mailing.
- Financial planning with a spreadsheet program.
- Writing one-off business letters.
- Recording employee hours for job costing.
- Linking into remote host computer facilities
- Networking with other similar computers on an office floor.

The monochrome screen should not be a problem, but the keyboard may give you some concern. Some users will be worried about their 'corporate image'. What would the customers think if they saw it?

And how about maintenance? Commercial computer users are vitally concerned about keeping their systems on the air. If a

Perhaps the most compelling reason to start with a PC is the growing wealth of business software now being advertised in computer magazines.

computer goes down, the firm's operation should be able to continue with a minimum of interruption. This means system redundancy; put another way — you need a few of these goodies stashed away in a cupboard — just in case. Of course, if your requirement is for just one machine, redundancy becomes expensive. You may need to assess the vendor's ability to provide reliable, fast service, and you would like some assurance that she or he will be there for some time to come.

Another factor will be documentation and (possibly) educational services for the staff who will be using and/or programming the beast. Much of the documentation now available for home computers leaves a lot to be desired. There is no excuse for jinglish manuals for a product which has been selling for over 12 months. Even some of the English-sourced manuals are skimpy in areas where you most need them.

In this strictly *caveat emptor* situation, it is the buyer's responsibility to check these factors before making a purchase.

On the more positive side, the various machine-specific user groups can offer a great deal of help to new users. I rather like the name of the Sinclair QL group; it's called the QLUB (QL User Bureau).

Going even Bigger

It's not just queasy feelings about using cheap computers which sends some buyers to the bank manager to dive in at the deep end. Let's consider some of the factors which might convince you to buy (say) an IBM PC (or a PC compatible).

Perhaps the most compelling reason to start with a PC is the growing wealth of business software now being advertised in computer magazines. You are continually bombarded with advertisements for new spreadsheets, new word processors, new database systems, fully integrated systems, fancy graphics, you-beaut plug-in

cards to add anything from a modem or a hard disk to an ESP port which can read your mind. It's a pressure sell, and many there be who fall therein.

May I suggest that the prime reason for dissatisfaction with an upgraded home computer is the limit to its 'upgradability'. Just how much storage can you add to your XYZ computer? Forget the joysticks, the colour, the sprites and the multi-voice sound generator. Ask whether or not it can have a hard disk attached. Will the operating system handle the hard disk storage efficiently? Reliably? When you've added a hard disk, can you still add other peripherals such as a modem or a mouse?

And is the operating system so peculiar to this machine that you will be locked into it forever? Portability of software, even BASIC programs, is important for a 'going concern'. Today's hit computer of the year may be at the bottom of the charts five years from now. Can you transfer your hard-earned programs and data files to the next big hit? Will the strange storage media be readable by another machine? Is its BASIC so peculiar you'll need to rewrite every line of code if it's to run on another computer?

I suppose it's these considerations which have helped many small firms to take the plunge at the very beginning. It's pretty true to say that one of the best things going for the IBM PC is all the similar computers which are *not* IBM PCs; there are just so many machines into which you can poke your IBM PC disks and see your programs run just like on the 'real thing'. That's reassuring, and management is a real sucker for assurance.

Another thing in the PC's favour is its ability to address up to 640 Kbytes of RAM — that's plenty for most 'real' applications. And there are plenty of 'real' applications to choose from. It's a buyer's market.

In a sense, the IBM PC (and its blue clones) is the 'world computer'. It's become an industry *de facto* standard, and that too is reassuring.

Where Next?

Well, the sky's the limit. Or is it your financial credit rating? Remember the computer is just another machine. Firms buy machines to improve their operating efficiency, which in turn improves their performance. This is true whether we're concerned with profit or non-profit; the computer must justify its acquisition on a hard-headed basis. So too must upgrades.

One such upgrade is the hard disk. Per-

Cheap Solutions

sonally, I bumbled along with a twin floppy disk system for years. When I took the plunge and bought Ron (my President 16-210) with a 10 Mbyte hard disk, my programming efficiency improved, as did the speed with which I could finish articles. Gone were the floppy-shuffling blues. Suddenly I felt a burden lifted, and computing became once more an enjoyable experience. We don't really go on happy feelings when assessing hardware, but if your staff are happier, they'll work better.

Hard disks frightened me for years before I bought Ron. There were too many stories about disk crashes and unrecoverable megabytes of valuable data and programs. I have made it a daily ritual to transfer any altered files to floppies before retiring for the night.

A couple of nights ago, I thought the worst had happened. As I sat pounding an article in Wordstar, the hard disk audibly slowed down for a few seconds, then slowly picked up speed again. Somehow Wordstar didn't seem to mind — at least not just then. An hour or so later it happened

Hard disks frightened me for years before I bought Ron. There were too many stories about disk crashes and unrecoverable megabytes of valuable data and programs.

again, and I got a 'Drive not ready' error message. Again the drive slowly came back to speed, and Wordstar continued after a single retry. I was scared witless.

The next morning I rang President about it. It was either the disk controller card, or the disk itself. I was invited to ship both back to Hornsby for a swapover. Dutifully I removed Ron's outer garments and looked long and hard at the cards therein. There it was. A connector from the controller to the

drive had slowly worked itself loose and was making an erratic connection to the circuit board. I guess this was due to the fact that the hard disk shudders in its flexible housing whenever there is a seek operation. I reattached the connector, left the cover off Ron for a day, and lo — the problem was solved. Hard disks rule, okay?

The most compelling reason to go 'hard' is the added online storage. It also makes available neat packages like Sidekick (I can't live without it).

The yellow brick road meanders into the distance. Along the roadside I see the PC AT, multi-user systems with Unix, spider-web networks of micros spanning the meadows with channels to remote mainframe computers ...

Be warned. You plant your feet on that road when you wander home with your first little home computer and complain about the unreliability of its rotten little cassette recorder system. Don't worry, Dorothy, it's a straw man. There's a tin man down the road, and maybe an iron man and a steel man and ... □

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While we're on the subject of cheapies, Phil Grouse had a look at the Aquarius from Mattel, which just has to be about as cheap as you can get. Is it money well spent?



THIS ATTRACTIVELY boxed Mattel product packs quite a punch. For under \$100 you obtain a quite respectable computer system with BASIC in ROM and a smidgin of RAM — 4 Kbytes to be exact. Unfortunately, after the system has taken its overheads, you're left with a measly 1781 bytes. While this is enough to hold the Mickey Mouse programs which are listed in the handbook, you'll soon need the 16 Kbyte or 32 Kbyte RAM cartridges if you want to run purchased programs.

It outputs (in colour) to a normal domestic VHF TV set on either channel 0 or 1 (switch selectable).

The basic unit measures roughly 34 cm by 15 cm and is 5 cm deep at the rear. The

keyboard is sloping, but measures just 23 cm by 10 cm — and that includes a healthy margin. In other words, this is a very small keyboard. The keys themselves have been described by other writers as 'chiclets': each key is made of a rubbery substance and is 9 mm square. The keys have a rather wobbly feel, and a short travel. This is definitely not for experienced typists, but youngsters will have no problem with it.

The space bar is not in its usual place at the bottom of the keyboard, instead being a double-width key off to the bottom left of the keyboard — a no-no for anyone with any keyboard experience at all. The RTN (return) key is on the bottom right corner, while the RST (reset) key is at top left and is

surrounded by a square ridge to counter accidental presses. A slip-on plastic overlay provides a guide to the keys which print entire BASIC keywords when pressed in conjunction with the CTL (control) key. This idea was introduced with the first Sinclair ZX80.

The power switch is to the right of the machine, DC power being derived from an externally connected, rather hefty multi-voltage transformer/rectifier which plugs directly into the mains.

Under a black plastic cowling hides a multi-way edge connector designed to accept add-on RAM cartridges, or the 'Mini Expander', which turns the single socket into two and provides two joystick connec- ▶

AQUARIUS

tions. The Mini Expander lets you use a RAM extension and a pre-programmed ROM pack at the same time.

The rear of the computer has three connectors. One is a simple 4 mm socket labelled 'printer', designed for a 40-column thermal printer which is sold separately.

A second socket is a five-pin DIN connector labelled 'cassette'; the separate data recorder connects to this socket via a supplied cable. Unfortunately, the recorder also needs a 240 volt mains supply, so by the time you've got the recorder, computer and TV all going nicely, you've devoured three power outlets. Don't worry, it won't blow a fuse, just the budget for double adaptors.

The third socket is labelled 'TV'. It outputs an RF signal into a supplied 75 ohm cable which terminates in the usual switchbox arrangement. My TV has a 75 ohm input socket, so all was well. If yours has a 300 ohm input then be sure the switchbox supplied will suit your connections.

As is common with computers which generate their own VHF signal, EMI (electromagnetic interference) can be a problem. The screen may exhibit a range of symptoms, including drifting patterns, smudgy colours, and tuning difficulties. The Aquarius is no exception, but the problem can be minimised by carefully positioning the machine until the best picture is obtained. After just a few moments of fiddling and rearranging, the picture on my receiver was sharp as a tack, and the colours were brilliant.

Being an engineer at heart, and failing to discover from the documentation what CPU was in use, I took to the base of the machine with a screwdriver and revealed a nicely constructed PC board. Alas — all the chips were numbered with OEM codes. It looked and tasted like a Z80, but then it might also have been a 6502. It certainly wasn't a 68000. Sigh.

Super Manuals

The manuals provided with this machine were *superb!* The main manual is a delightfully illustrated two-colour booklet telling the novice how to put it all together, and what precautions to observe. Although it's a 'fun' book, it quickly gets down to the nitty-gritty of BASIC programming in a whimsical didactic style. There are oodles of sample programs to play with, and excellent descriptions of how they work.

The CPU looked and tasted like a Z80, but then it might also have been a 6502. It certainly wasn't a 68000.

The manual includes a sizable reference section, an appendix listing the error messages, memory maps, the character set and the rules for arithmetic operator precedence. It concludes with five pages of cute practice programs. If I'd had the time, I'd have read it cover to cover just for the fun of it.

There is also a set of spiral-bound reference cards you can stand up next to your keyboard. This is largely a summary of the manual, but includes fresh programming information and a sample program for cheque book balancing.

The standard of documentation is maintained for the various add-on devices.

But I still can't find out anything about the CPU!

Software

Programs are available either on cassette or as plug-in ROM modules. I had a few reading problems with the Read-It cassette

program, but the flipside worked fine. One serious omission from both the supplied cassettes was an indication of how much memory was required. As it turned out, Read-It needed the extra 16 Kbyte module.

The only ROM pack included with the evaluation system was for the Logo language; this too was brilliantly documented. As for the implementation of Logo, it's one of the best I've seen. There can be more than one turtle, and the resulting graphics are excellent.

Incidentally, the quality of documentation dropped sharply with the supplied cassettes. In fact there was absolutely nothing with the Read-It program — not even a short description of what it does. As it turned out, this is a real Mickey Mouse program. It purports to be a speed reading exerciser; forget it. It's a peanut.

The other cassette, a six-level chess program, was more interesting. The graphics left a lot to be desired, but it worked reasonably well (albeit a bit sluggishly). The documentation consisted of a single card included with the cassette. So far as I could tell, there was only one way to exit the program — hit the RST key. And it doesn't beep when you make a wrong move.

If you're looking for a 'starter kit' for the kids, you might consider the Aquarius; it could be the answer. But if your kids are like mine, you'll be looking for something bigger to replace it before long. □

	Excellent	Very Good	Good	Poor
Value for Money:		●		
Documentation:		●		
Ease of use:		●		
Reliability:	●			
Vendor Support:		●		

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Manufacturer:	Mattel Inc, Hong Kong
Distributor:	Dick Smith Electronics
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CHEAP THRILLS



We asked several of our regular columnists to write about the most satisfying programs they've ever spent their time with on their respective machines — in other words, to name their favourite games. What follows is their highly expert (and well-researched) selection.

Cheap Thrills

Get out of this one if you can ... (BBC)

'Slaves are measured by the ton in galactic trading. This may seem a little strange, but it includes the cryogenic suspension system necessary to keep them alive during space travel.

"Amphiboids are usually a lot sharper than their wet, sluggish appearance would suggest. They are usually keen to trade in narcotics, or exotic foodstuffs. Skin creams are always well received.

'Felines are dangerous in the extreme. All traders are advised to wear body suits, to prevent secretions of sweat from triggering a feeding response..."

Elite isn't an adventure game in the style of having to find one's way through, over, past and under all manner of obscurity. It isn't just a blaze-away video game, either, although possession of a Lance & Ferman LF90 military laser will be useful in the vicinity of a planet inhabited by insectoid anarchists. It isn't a flight simulator, but you have to be a skilled pilot to successfully cross galaxies, dock your Cobra Mk 3 ship and outwit the Galactic Police's Viper craft, especially if you're carrying contraband such as slaves or narcotics — particularly Arcturan Megaweed.

Success may take — no, will take — a minimum of several months to achieve. How can one succeed in a game that appears to have no end? Perhaps we'd better start again.

Elite is, above all, a trading game. You are cast as an intergalactic trader equipped with a nippy trading ship capable of carrying 20 tons of cargo and fitted with basic astrogation and weapons systems. The 64-page *Space Trader's Flight Training Manual* contains enough information to become familiar with the Cobra's equipment. An important part of this is the Worldata Link, a database containing information on the 2000 planets in the Galactic Co-operative, spread across eight galaxies. Using the Link you can carefully choose where to buy and sell goods in order to make yourself rich enough to afford some of the homely comforts an intergalactic trader longs for, such as cargo bay extensions, escape pods, military lasers and missiles. A SinCorn docking computer is an invaluable option, as docking is a particularly time-consuming skill that must be mastered early in the game. At 5000 Cr, a Xexor intergalactic hyperdrive may appear expensive, but it can give an experienced trader a big boost into new markets

You have to be a skilled pilot to outwit the Galactic Police's Viper craft, especially if you're carrying contraband such as slaves or narcotics — particularly Arcturan Megaweed.

One of the problems arising from the variety of planets in the Co-operative is that a trader never knows what sort of reception is likely at any particular planet. From experience, it is advisable to stay away from dictatorships, feudal states or anarchies, as these tend to attract xenophobes, who always shoot first. Confederacies or corporates states are more benign, though the opportunities for quick profits are fewer.

Having developed the skills necessary to evade some of the less lethal types of the 22 craft listed in the *Observer's Guide to Ships in Space*, a trader may feel ready to venture near some of the less stable planets. One point stressed repeatedly in the manual is not to get mixed up with Thargoids, as captains of their ships have had their fear glands surgically removed!

Of course, we're not all born to be traders. Tiring of the humdrum of the business world, a trader may decide to become a bounty hunter, pirate or asteroid miner. Equipped with a scoop, ships can also cruise through space collecting and recycling debris. Illegal trading, too, can be very risky, but rewarding.

The flight console of the Cobra closely resembles the keyboard of a BBC micro. The screen, using two modes simultaneously, shows stunning all-round views from the ship on its top three-quarters and the instrument panel on the bottom. This is a marvel of ergonomics, containing information on cabin temperature, altitude, forward velocity, orientation, fuel, and an extraordinarily compact 3D radar display without which it is impossible to engage successfully in any form of combat.

Why the name? It's all a matter of status. Traders begin their career as 'Harmless' and increase in status by demonstrating

trading and fighting skill. After becoming 'Mostly Harmless', 'Average' or 'Competent', in a few months you may become 'Dangerous' or even 'Deadly', but 'Elite'? One thing is certain: whatever your status, you'll never be able to forget it. Every time you retire from the game your status, including your criminal record, is retained on the disk. Only by starting again under a different name can you rid yourself of your past — unless perhaps you could win the confidence of a feline alien. According to the manual this results in "...almost invariably (being) invited to mate, so a certain aloofness is recommended." Ah, but what a way to go!

Elite is published by Acornsoft. Available through BBC dealers, recommended retail price \$40.

Reviewed by Bruce Mitchell

Reach For The Stars (Commodore 64 and Apple II)

The trouble with most computer games is that they don't have staying power. After a short honeymoon period you find you've either mastered the knack or the game is virtually impossible. Either way there seems little point in playing it any more — which is a pretty disturbing state of affairs given the cost of the games.

'Reach for the Stars', an Australian-developed space strategy game, is one I find exceptional in that it consistently proves challenging and fun to play. It's a game that relies more on stimulating your grey matter than on eye/hand co-ordination or zappy graphics. Each game is different and no particular strategy will always win.

The scenario is very simple. You control a single planet in one of 54 star systems. Your objective is to develop and build a space empire — a task complicated by the existence of three other players attempting to do exactly the same thing. The other players may be either people or the computer, and the intelligence of the computer 'players' is the most remarkable feature of this game. Unlike most computer games, the computer players have no resource advantages over the humans; they survive on their wits (or algorithms?) alone, and each of them adopts distinctly different strategies and tactics. They're just as ruthless towards each other as they are towards humans.

All players start on a more or less equal basis, but their destiny is dependent on how they choose to deploy their resources.

Cheap Thrills

You can spend resource points to improve your planet's economy — raising industrial level or making short or long-term improvements to the environment. You can also spend on exploration, technology or defence; defence spending takes the form of building defence bases or starships.

You face an immediate dilemma here, because the more you spend on defence, the less you have for economic development (it's a pity Reagan and Gorbachev haven't played this game). When you spend on economic development you see the immediate rewards as your planet churns out ever-increasing yields of resource points — and it's a snowball effect, because the more you have, the more you can re-invest in growth.

However, there is a limit to which a planet can be developed before you face the eventual pressure of over-population. This forces all players to seek out new star systems to colonise. You can build high-speed unmanned explorers that are inexpensive but easily destroyed, or you can send starships (more expensive but more durable) to explore the universe in search of new planets to colonise.

Each of the 54 star systems may contain up to three planets. Some are much easier to develop than others, and since all four players are searching for the same 'good' planets, conflict will inevitably arise. This is when your economic development really pays off, as with a strong economy you'll be more capable of building the large star fleets necessary for defence or assaults.

As the game progresses you need to raise your technology level in order to have ships that match your opponents. There are four levels of technology; you start at level one, and to raise it you must invest resource points over several turns. The higher-level ships have more speed and firepower, but cost more to build. Even if you build no ships, reaching a higher level makes your planetary defences more resistant to enemy attack.

You never have enough ships to properly defend all your planets, so you need to put out pickets on neighbouring star systems, and scour the galaxy for signs of enemy activity. It becomes very much a cat-and-mouse game, requiring anticipation of enemy strikes.

Victory in the game is determined by four factors: colony development, starship battles, planetary conquest, and enemy colony destruction. You have the option of adding weight to any of these factors, and

It's interesting to see how many good games came from Mytek, which is another reason why all Microbee owners should mourn the passing of that company. Who knows how many more great programs were in the pipeline?

can thus develop different strategies. (With luck, you can even be successful playing non-aggressively!)

Scenario length varies, and since the longer scenarios may take three or more hours, you have the ability to save the game at any point. You can save one game on the program disk, or create a special RFTS 'save' disk.

When the game ends it plays the first bar of 'Advance Australia Fair' (yes, this brilliant game is an Australian invention) and displays the final victory points of all players, together with an announcement of the degree of victory: marginal, substantial or decisive. You have the opportunity to continue the game (good for bad losers!), or see a breakdown of everyone's planets and starfleets (this is helpful if you're wondering why you lost or want to learn from your mistakes).

The graphics of this game are fast but functional. You can view a full map of the galaxy showing where your ships are, or a zoomed-in view showing particular sections. The zoomed screen can be scrolled in any direction, and you can move to planets you're interested in by means of a blue cursor. The sound effects are comparatively simple, but quite adequate for a strategy game. Most of the time the game is silent, with sound mostly used to herald battles and battle rounds.

Reach For The Stars comes with one program disk, two game starmaps and a rulebook. Versions are available for both Commodore 64 and Apple II. I take my hat off to Ian Trout (designer) and Roger Keating (writer) for demonstrating that Austra-

lian software can more than knock the socks off the best in the world.

Reach for the Stars is published by Strategic Studies Group and costs \$45.

By Ian Allen.

Just Choosing One was Too Hard (Microbee)

The telephone rang unexpectedly and a pleasant voice on the other end explained that *Your Computer* would like a review of my favourite Microbee arcade game for the August issue — and could we have it by next week?

This simple request caused havoc. Just which was my favourite game? I started to compile a shortlist. The game I last played was a neat colour version of Reversi, but since this was from the SMUG library, it was probably not eligible. The best adventure is undoubtedly Bunyip Adventure, but that isn't an arcade game. I decided I'd better make myself a list.

Space Invaders (either AT's or Mytek's): good but not outstanding.

Defender (either AT's or Mytek's): good graphics, sound and control.

Robot Man (AT): nice graphics, but poor control.

Minedrop (C-Tech): good graphics, sound and control.

Ghostmuncher and Kilopede (Mytek): two good games and very good value.

Astro Plus (Mytek): the first really good graphics game for the Microbee.

Frogger (AT and Mytek): good, but not my favourite.

Scrambler (AT): great colour and graphics, but no sound.

King Tut (Mytek): good, but not in colour. At least it's different.

King Kong (Mytek): good, but only three limited scenarios.

Chopper (Mytek): too simple and rather boring.

Grotnik Wars (Grotnik Software): very good, but for me a little too hard.

Gridfire (AT): good graphics and sound, but limited action.

Capture (AT): quite a captivating game, with several levels of difficulty.

Emu Ioust (Mytek): great graphics, each frame is different, sound is adequate, control is good — not in colour, though.

There are, of course, many other games, but those listed are (in my opinion) among the best on the market. It's interesting to see how many were from Mytek, which is another reason why all Microbee owners should mourn the passing of that excellent company. Who knows how many more

Cheap Thrills

great programs were in the pipeline! I understand AT has just released a new batch of programs, but I haven't seen any of them yet.

However, back to my task: which is my favourite game? Overall it just has to be Emu Joust, which would take any prize I had to give. The program starts off with a large logo giving the name of the game, and offers you the choice of seeing the rules, starting the game or watching a demonstration session. If you choose the game, you're shown a total of five roosts from which the dreaded knights on their vultures can appear.

You (as the good guy) appear as a knight on a white emu. Your lance is at the ready, and with a push of the Shift key the emu's wings flap and you fly. The < and > keys determine the direction, and the movement is particularly smooth. Each press of the Shift key flaps the wings, and when you stop the emu drifts downwards realistically.

But wait a minute, something is happening on one of the roosts: a bad guy is appearing. He drifts around the screen while you chase him, and if your lance is higher than his at the point of contact, he will fall to earth as an egg. If his lance is higher than yours, you're killed. However, you have three lives, and gain an extra one each 10,000 points.

The egg is going to give you trouble if you don't trample on it, as the bad guy will be reborn with more intelligence within the egg. You score points for squashing the eggs, and once all the baddies (three of them) in the first frame are dispatched, you gain a bonus score, depending on your speed. On the fourth frame, an egg wave appears and countless eggs have to be dispatched as they materialise, or they also turn into baddies. If you survive this frame, a wall of flame (good graphics) appears at the bottom of the screen to add an extra hazard. Further hazards include more egg waves, and the number of roosts gradually reduces, leaving you nothing to hide beneath. At the same time, the baddies become more intelligent and attack with more accuracy.

Finally, when you've been dispatched to your doom, you have a full hall of fame display showing the highest ten scores and

"While it would have been possible to program the computer to lose now and then, it could only lose by making a mistake, and who would trust a computer that kept making mistakes?"

the names of the scorer. I still haven't discovered what happens after frame nine!

Yes, all in all I'd have to say this is my choice as the best Microbee arcade game.
By Colin Tringham

Arcade Games — on the IBM-PC?

When our personal computer arrived, the first piece of software I bought was Microsoft's Flight Simulator, which was getting rave reviews. I didn't know whether to be impressed or depressed by the manual, because it was unusually long, and that plane seemed to have an awful lot of controls.

Eventually I started my first flight. Getting off the ground was reasonably straightforward, but flying a straight, level flight proved unexpectedly difficult, and I usually went into a spin straight down into the lake. After a while I overcame this problem and was ready to think about landing. This turned out to be more tricky; at first I couldn't even find the airport! When I did find it I lined up the runway, swung past it and tried to come in from the opposite direction. Still no luck; apparently you have to take off 'lock' before you're in the right position. This is something like backing a car, I suppose, but I'm not in any position to be dogmatic; I never did learn how to land! About my only successful move was to crash into the John Hancock building deliberately.

Back to terra firma for me.

Next I bought the FriendlyWare PC Introductory Set. This contains a number of

serious programs plus a few games. The simplest one is Tic Tac Toe, the American equivalent of our noughts and crosses. The manual says: "The fellow who programmed this game claims it can't be beat (*sic*)."
In an interview one of the authors stated that while it would have been possible to program the computer to lose now and then, it could lose only by making a mistake, and who would trust a computer that kept making mistakes?

The display looks great in colour, and is good for children who haven't yet learnt how to avoid mistakes. When every game ends in a draw, though, it becomes a little dull (just like the real noughts and crosses, in fact).

One of the many Pacman clones is hidden away in the back of a serious program called The Instructor, which teaches you how to use a PC and in particular its keyboard. This is fun.

It may sound boring and traditional, but my favourite game for a long time has been Hangman, which is another of the programs to be found in the FriendlyWare PC Introductory Set. The game is explained in the manual like this:

"The computer is the Hangman, and unless you correctly guess the secret word in ten tries or less you'll find yourself swinging from the end of his rope.

"Key in one letter at a time. If your guess appears in the secret word, the computer will show you where it fits. He'll also give you a free, no-risk guess at the word.

"Each time you guess wrong the computer will draw a portion of your body on the gallows. If you haven't guessed the secret word by the time the final body part is drawn under the rope, you lose."

You lose all right, because if by that time you haven't guessed the word the program doesn't tell you what it was, and there doesn't seem to be any way to find out. A pity, because otherwise the program is excellent; the words vary in length from three characters up, and there are enough of them that you don't find yourself remembering them. This game is even more fun when you play it with others, because no matter how skilled a player may be, many choices are going to turn out to be wrong

By John Nicholls

□

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TOTL Time Management rated 4 stars	(VIC \$45) \$69	TOTL SPELLER works with EasyScript, Bank Street	\$45
TOTL Home Accounting	\$69	FLEET Fax, 40, 80, cols	\$135
CONTINENTAL Home Accounts	\$37	SUPER TEXT 88 column	\$108
ABRACALC HOME MANAGER + SPREADSHEET	\$39	HESWRITER	Cartridge \$55
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CASH CONTROLLER	\$24	SBFTSMITH	\$49
EXPENSE MANAGER	\$19	EASYSRIPT 64	\$89
dialog TRANSACT book keeping system	\$46	OMNIWRITER/OMNISPELL	\$95
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		LETTER WRITER	Tape \$19, Disk \$22
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		AD PREPARED 21/6/85	

64 ACCOUNTING PACKAGE \$159
TOTL's newest lightning fast machine language version (new in May 1985) includes stock control and printing of invoices and statements. Dates, postcodes, etc. selectable for Australia or US. All programs load from a master menu. Balance-forward system. Invoices allow both taxable and non-taxable items and screen prompts and printed output headings can be customized to fit any business. This and the Taihaho disk drive make your 64 a powerful business machine available.

SOFTWARE DESIGN ACCOUNTS \$125
Software Design Inc. Will do all the books of a business and print reports but not update inventory. Excellent review in COMPUTE!'s Gazette (November 1984).

AUTOCALC 64 spreadsheet Disk \$59, Tape \$55
Suitable for any application involving extensive manipulation of data and formulae, from financial planning to investment analysis, from market research to sales forecasting, from scientific or engineering calculations to technical analysis. Copies easily with trigonometrical functions, parenthesis and Boolean logic as well as totalling and averaging and accepts complex conditional statements. You can choose column width or number of rows, numerical format, etc. to suit your purpose. 2,000 cells. Full replicate facility. Data can be SAVE'd or printed out. Comprehensive instructions plus practical demonstration program. Easily best value-for-money.

TO ORDER, SIMPLY PHONE
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YC8/85

1200/1200 and VIATEL acoustic coupler. \$199

With RS232 interface and software for Commodore, BBC, Amstrad or Spectrum included. Telecom approved both here and UK.

AUTO DIAL, AUTO ANSWER MODEM 300 baud \$199

With VIP terminal (usually \$99 from Commodore) included FREE! Not Viatel. Full half duplex. Plugs into User Port of your C64, C128 or VIC 20 and draws its power from there. Direct connect to the phone service. This and Compute's Gazette program lets you run your own Bulletin Board. 300 baud.

300/300 and 1200/75 modem ACME. \$299

Direct connect. Plugs into User Port of your 64 and draws its power from there. (Adaptors for other computers available). Includes 3 months sub to STARS encyclopedia and 6 weeks sub to MICRO 666 (Commodore database). Cartridge software \$79.

SENDATA direct connect modem 300+1200/75. . . \$299

Connects directly to your phone socket and has its own handset. Plugs straight into your 64 and does not need connecting cables. Software included FREE!

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FLASH '85 with built-in DN/OFF switch	\$175	INTERCEPTOR SUPABASIC	\$35
FLASH SX64 version	\$175	SPEED BASIC	Disk/Tape \$29
NUMERIC KEYPAD 64/VIC-20	\$99	ULTRA BASIC 64	Disk/Tape \$65
DOT MATRIX PRINTER LISTER	\$199	TURBO EXTENDED BASIC	Tape \$40
SMITH CURRONA delay wheel Printer	\$495	SIMON'S BASIC	\$60
INTERFACES for 64/128/VIC	12 different from \$49	BLITZ! Fastest Compiler of all	\$99
RS232 DE LUXE INTERFACE	\$99	COMMODORE'S PETSPEED	\$89
MSD Single Drive, all metal 240 volt	\$499	6582 PROGRAM DEVELOPMENT CASSETTE	\$29
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SKAI newest, with in-built power	\$399	SPRITEMASTER	\$35

TAIHAGO Commodore/Apple DRIVES \$495

Top quality all metal disk drives that will run BOTH Apple and Commodore disks. Complete with all plugs and 20-line parallel cables to connect to all plugs to your C64 or C128. Switches let you choose Device No. 8 or 9 and Normal, Write Protect or Override Write Protect. Single drive can be expanded to double by purchase of additional drive for \$355. Complete with regulated 240 volt 50Hz power supply. SINGLE DRIVE, with power supply, cables and interface for C64 \$495. DOUBLE DRIVE, with power supply, cables and interface for C64 \$850.

OLYMPIA NLQ 160 cps \$599

EPSON NLQ PRINTER with Commodore i/face . . . \$475

GEMINI work alike PRINTER (proportional lettering). \$395

All the features of the famous Gemini PLUS lots more graphics and proportional spacing. It's 1,100 words per minute but actually almost 7% slower than the Gemini (which now sells for \$150 more). Both Commodore and IBM graphics.

IBM COMPATIBLES

All these programs, written for the IBM Pc and XT, have been tested in the versions we sell to run on Commodore's new PC-10 and PC-20. They should also run on all other IBM compatibles, since they are the latest editions with all the early bugs removed. Because we've just opened this division, you can be sure that what you buy is brand new stock and not tired old programs that have been sitting for a year or more on a dealer's shelves, and we can get really good prices because our supplies come from the same sources we already use for the large quantities of other Commodore software we sell.

BUSINESS MANAGER \$540

Over 1000 already in use throughout Australia. Fully integrated, ready to use accounting system. Includes stock control/inventory, Accounts Receivable and Payable and General Ledger. Menu driven and easy to use. OTHER PROGRAMS AVAILABLE: Pay Roll, Real Estate, Property Management, Insurance Brokers etc.

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Operates a cash drawer, keeps track of your stock, laybys, COD, controls debtors, provides sales analysis, profit margins by product, department and/or branch. Prints receipts, statements, etc. at the time of the transaction.

316 XT IBM COMPATIBLE 256K . . . \$2950

512K with dual 360K drives, RGB, composite and mono output, all the standard features PLUS \$2,250 of VISICORP software FREE! Buy this powerful IBM XT workalike and get VISIWORD, VISISPELL, VISICALC, VISITREND, VISIDEX, VISIPILOT and MS. DOS free!

Chambers Computer Supplies

48-52 Monkhouse Drive, Endeavour Hills, Melbourne. 3802.

SOFTWARE ON THE CHEAP

Amstrad

EDUCATION

Guide to BASIC Part 1
AWA Thorn
Cassette \$45

Guide to BASIC Part 2
AWA Thorn
Cassette \$45

WORD PROCESSING

Easi-Amsword
AWA Thorn
Cassette \$29.95

Apple II & Clones

GAMES

Beagle Bag
Imagineering
Disk \$49.95

Champ Loderunner
Imagineering
Disk \$49.95

Choplifter
Imagineering
Disk \$49.95

Dragonfire
Imagic
Disk \$29.95



Ghostbusters
Imagineering
Disk \$34.95

Loderunner
Imagineering
Disk \$49.95

Midway Campaign
High Technology
Cassette \$30.50

Night Mission Pinball
Imagineering
Disk \$49.95

Transylvania
Imagineering
Disk \$39.95

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Alien and Face Flash
Imagic
Disk \$29.95

Alphabet Zoo
Imagineering
Disk \$39.95

Bugs and Concentration
Imagic
Disk \$29.95

Compu Bar
Imagineering
Disk \$24.95

Compu-Read 3.0
Imagineering
Disk \$43.95

Compu-Spell Data 4
Imagineering
Disk \$32.95

Compu-Spell Data 5
Imagineering
Disk \$32.95

Compu-Spell Data 6
Imagineering
Disk \$32.95

Compu-Spell Data 7
Imagineering
Disk \$32.95

Compu-Spell Data 8
Imagineering
Disk \$32.95

Compu-Spell Data 9
Imagineering
Disk \$32.95

Compu-Spell System
Imagineering
Disk \$43.95

Delta Drawing
Imagineering
Disk \$39.95

Facemaker
Imagineering
Disk \$39.95

Fraction Fever
Imagineering
Disk \$39.95

Frenzy and Flip Flop
Imagic
Disk \$29.95

Golf and Compubar
Imagic
Disk \$29.95

Gulp and Arrow
Imagic
Disk \$29.95

Hey Diddle Diddle
Imagineering
Disk \$39.95

Jar and Chaos
Imagic
Disk \$29.95

Kids on Keys
Imagineering
Disk \$39.95

Kidwriter
Imagineering
Disk \$39.95

Kindercomp
Imagineering
Disk \$39.95

Pop-R-Spell
Imagic
Disk \$29.95

Rhymes and Riddles
Imagineering
Disk \$39.95

Snake-O-Nyms and Word Flip
Imagic
Disk \$29.95

Snooper Trooper 2
Imagineering
Disk \$39.95

Snooper Troops 1
Imagineering
Disk \$39.95

Statistics 3
Imagineering
Disk \$43.95

Story Machine
Imagineering
Disk \$39.95

The Most Amaze Thing
Imagineering
Disk \$39.95

Trains
Imagineering
Disk \$39.95

DATABASE

The Filer
Imagineering
Disk \$34.95

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Imagineering
Disk \$49.95

Disk Quick
Imagineering
Disk \$49.95

DOS Boss
Imagineering
Disk \$39.95

Flex Text
Imagineering
Disk \$49.95

Flex Type
Imagineering
Disk \$34.95

Frame Up
Imagineering
Disk \$49.95

Pronto DOS
Imagineering
Disk \$49.95

Silicon Salad
Imagineering
Disk \$44.95

Tip Disk #1
Imagineering
Disk \$34.95

Typefaces
Imagineering
Disk \$34.95

Utility City
Imagineering
Disk \$49.95

MISCELLANEOUS

Model Diet
Imagic
Disk \$49.95

Apple IIc

Graphics Library
Imagineering
Disk \$44.95

Apple IIe

GAMES

Carriers at War
Imagineering
Disk \$49.95

EDUCATION

Cunning Running
Jacaranda Wiley
Cassette or disk \$545
Up to four students can practise the basic map skills of reading and understanding map language, understanding compass directions, and using alphanumeric grid-square references.

Gold-Dust Island
Jacaranda Wiley
Cassette or disk \$49
This game encourages co-operative behaviour and good communication. Students learn that familiarity and competence in identifying and using the points of the compass, and estimating distance quickly and accurately, are a distinct advantage.

Quick-Cartage Company
Jacaranda Wiley
Cassette or disk \$45
Students practise the basic map skill of using linear scales to measure distances.



Raft-Away River
Jacaranda Wiley
Cassette or disk \$49
An adventure simulation in which

students develop skills in reading comprehension, effective communication, co-operative behaviour and problem solving.

Scavenger Hunt
Jacaranda Wiley
Cassette or disk \$35
Students must apply the basic mapping skills of identifying and using the eight major compass points and estimating distance.

Sheep-Dog Trial
Jacaranda Wiley
Cassette or disk \$35
A challenging grid-reference activity which requires logical thinking and co-operative strategy planning if sheep are to be mustered quickly.

WORD PROCESSING

PFS Mailist
Imagineering
Disk \$32.95

GENERAL BUSINESS

PFS Checks
Imagineering
Disk \$32.95

GENERAL UTILITIES

Graphics Library
Imagineering
Disk \$44.95

Atari

GAMES

Beach Head
Imagineering
Disk \$49.95

Choplifter
Imagineering
Disk \$49.95

Loderunner
Imagineering
Disk \$49.95

Zaxxon
Imagineering
Cassette \$44.95

EDUCATION

Hodge Podge Artworx
Ozi Soft
Cassette or disk \$29.95
Cartoons, songs and colour help to make this educational program interesting for the under six-year-olds.

Monkey Math
Ozi Soft
Cassette or disk \$29.95
Graphics and animation make this program a fun way to learn maths for the 4 to 10 age group.

LANGUAGES

English Software FORTH
Ozi Soft
Disk \$39.95

BBC

GAMES

Arcade Action
Gametrionics
Cassette \$31

Arcadians
Gametrionics
Cassette \$26

Aviator
Gametrionics
Cassette \$38

Boxer
Gametrionics
Cassette \$26

Carousel
Gametrionics
Cassette \$26

Castle of Riddles
Gametrionics
Cassette \$26

Chess
Gametrionics
Cassette \$26

Club Master
Gametrionics
Cassette \$26

Countdown to Doom
Gametrionics
Cassette \$26

Crazy Tracer
Gametrionics
Cassette \$26

Draughts and Reversi
Gametrionics
Cassette \$26

Drogna
Gametrionics
Cassette \$26

Freefall
Gametrionics
Cassette \$26

Gambit and Black Box
Gametrionics
Cassette \$26

Gateway to Karos
Gametrionics
Cassette \$26

Hopper
Gametrionics
Cassette \$26

J C B Digger
Gametrionics
Cassette \$26

Kingdom of Hamil
Gametrionics
Cassette \$26

Meteor Mission
Gametrionics
Cassette \$26

Meteors
Gametrionics
Cassette \$26

Missile Base
Gametrionics
Cassette \$26

Monsters
Gametrionics
Cassette \$26

Philosopher's Quest
Gametrionics
Cassette \$26

Planetoid
Gametrionics
Cassette \$26

SOFTWARE ON THE CHEAP

Rocket Raid
Gametronics
Cassette \$26

Sabre Wulf
Gametronics
Cassette \$35

Seventh Star
Gametronics
Cassette \$26

Sliding Block Puzzles
Gametronics
Cassette \$26

Snapper
Gametronics
Cassette \$26

Snooker
Gametronics
Cassette \$26

Sphinx Adventure
Gametronics
Cassette \$26

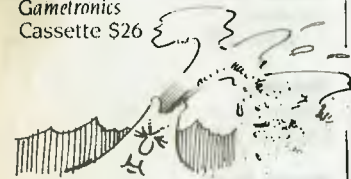
Starship Command
Gametronics
Cassette \$26

Super Invaders
Gametronics
Cassette \$26

Tetrapod
Gametronics
Cassette \$36

The Hobbit
Gametronics
Cassette \$39.95

Volcano
Gametronics
Cassette \$26



EDUCATION

Algebraic Manipulation
Gametronics
Cassette \$26

Business Games
Gametronics
Cassette \$26

Children From Space
Gametronics
Cassette \$26

Cranky
Gametronics
Cassette \$26

Crime and Detection
Gametronics
Cassette \$29.50

Cunning Running
Jacaranda Wiley
Cassette or disk \$35
Up to four students can practise the basic map skills of reading and understanding map language, understanding compass directions, and using alphanumeric grid-square references.

Dating Game
Gametronics
Cassette \$29.50

Examiner
Gametronics
Cassette \$26

Facemaker
Gametronics
Cassette \$26

Gold-Dust Island
Jacaranda Wiley
Cassette or disk \$45
This game encourages co-operative behaviour and good communication. Students learn that familiarity and competence in identifying and using the points of the compass, and estimating distance quickly and accurately, are a distinct advantage.

Hide and Seek
Gametronics
Cassette \$26

History
Gametronics
Cassette \$29.50

I Do
Gametronics
Cassette \$29.50

Jars
Gametronics
Cassette \$29

Jungle Puzzle
Gametronics
Cassette \$26

Just A Mot
Gametronics
Cassette \$35

Let's Count
Gametronics
Cassette \$26



Linkword French
Gametronics
Cassette \$38

Linkword German
Gametronics
Cassette \$38

Linkword Italian
Gametronics
Cassette \$38

Linkword Spanish
Gametronics
Cassette \$38

Missing Signs
Gametronics
Cassette \$29

Mr T Tells The Time
Gametronics
Cassette \$29.50

Mr T's Alphabet Games
Gametronics
Cassette \$29.50

Mr T's Measuring Games
Gametronics
Cassette \$29.50

Mr T's Money Box
Gametronics
Cassette \$29.50

Mr T's Number Games
Gametronics
Cassette \$29.50

Mr T's Shape Games
Gametronics
Cassette \$29.50

Music
Gametronics
Cassette \$29.50

Number Balance
Gametronics
Cassette \$29

Number Chaser
Gametronics
Cassette \$26

Number Gulper
Gametronics
Cassette \$26

Number Puzzler
Gametronics
Cassette \$26

Open Sesame
Gametronics
Cassette \$35

Peeko — Computer
Gametronics
Cassette \$26

Podd
Gametronics
Cassette \$26

Quick-Cartage Company
Jacaranda Wiley
Cassette or disk \$45
An entertaining way to practise the basic map skill of using linear scales to measure distance.

Raft-Away River
Jacaranda Wiley
Cassette or disk \$49
An adventure simulation which develops skills in reading comprehension, effective communication, co-operative behaviour and problem-solving.

Royalty
Gametronics
Cassette \$29.50

Scavenger Hunt
Jacaranda Wiley
Cassette or disk #35
Students must apply the basic mapping skills of identifying and using the eight major compass points and estimating distance.

Science Fiction
Gametronics
Cassette \$29.50

Sentence Sequencing
Gametronics
Cassette \$29

Sheep-Dog Trial
Jacaranda Wiley
Cassette or disk \$35
A challenging grid-reference which requires logical thinking and co-operative strategy planning if sheep are to be mustered quickly.

Spooky Manor
Gametronics
Cassette \$26

SOFTWARE ON THE CHEAP

Squeeze
Gametronics
Cassette \$26

Starter Wordsplits
Gametronics
Cassette \$35

Table Adventure
Gametronics
Cassette \$26

Temperature Control
Gametronics
Cassette \$26

Tense French
Gametronics
Cassette \$35

**The Grammar Tree
(sentences)**
Gametronics
Cassette \$35

Theatre
Gametronics
Cassette \$29.50

Time Traveller
Gametronics
Cassette \$35

Tree of Knowledge
Gametronics
Cassette \$26

Word Hunt
Gametronics
Cassette \$29

Word Power
Gametronics
Cassette \$35

Word Sequencing
Gametronics
Cassette \$29

Words, Words, Words
Gametronics
Cassette \$26

GENERAL BUSINESS

100 Programmes
Gametronics
Cassette \$26

Collector's Catalogue
Gametronics
Cassette \$29

Desk Diary
Gametronics
Cassette \$26

Forecast
Gametronics
Cassette \$29

Hooked on Numbers
Gametronics
Cassette \$26

Membership Manager
Gametronics
Cassette \$26

One to Nine
Gametronics
Cassette \$26

Personal Money Management
Gametronics
Cassette \$29

LANGUAGES

FORTH
Gametronics
Cassette \$39

LISP
Gametronics
Cassette \$39

LISP Demo
Gametronics
Cassette \$26

S-Pascal
Gametronics
Cassette \$43

Turtle Graphics
Gametronics
Cassette \$43

MISCELLANEOUS

Creative Graphics
Gametronics
Cassette \$26

Graphs and Charts
Gametronics
Cassette \$26

Picture Maker
Gametronics
Cassette \$26

View Printer Drivers
Gametronics
Cassette \$26

Watch Your Weight
Gametronics
Cassette \$26

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A.C.O.S
High Technology
Cassette \$29.95

Adventure Master
High Technology
Disk \$39.95

Adventure Quest
High Technology, Ozi Soft
Disk \$29.95
Explore middle earth, finding and following the hidden paths which lead to the dark tower.

Adventureland
High Technology
Cassette \$29.95

African Safari
High Technology, Ozi Soft
Disk \$29.95
Avoid the perils of the African desert while searching for the Kenyan diamond.

Alice in Videoland
High Technology
Disk \$34.95

Andromeda Conquest
Gametronics
Cassette \$35.50

Anty Up
High Technology
Cassette \$29.95

Asylum
High Technology
Cassette \$34.95, disk \$39.95

Avenger
High Technology, Commodore
ROM cartridge \$30.

Aztec Challenge
High Technology
Disk \$34.95

B-1 Nuclear Bomber
High Technology, Gametronics
Cassette \$30.50, disk \$35.50

Beach Head
High Technology
Cassette \$29.95, disk \$39.95
Imagineering
Cassette and disk \$34.95

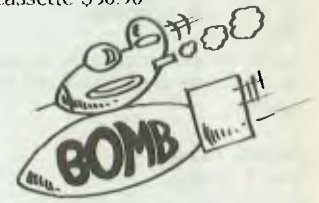
Beachhead II
Imagineering
Disk \$34.95

Benji Space Rescue
High Technology
Disk \$49.95

Blue Max
High Technology
Cassette \$29.95, disk \$39.95
Imagineering
Disk \$49.95

Blueprint
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ROM cartridge \$30
Help JJ build the Ammo Machine

Bomber Attack
High Technology, Gametronics
Cassette \$30.50



Breakdance
High Technology
Disk \$29.95

Breakthru
High Technology, Gametronics
Cassette \$40.90, disk \$47.50

Bridge Tutor
High Technology
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Bruce Lee
High Technology
Cassette \$29.95, disk \$39.95

Castle Wolfenstein
High Technology
Disk \$44.95

Caverns of Khafka
High Technology
Disk \$34.95

Champ Loderunner
Imagineering
Disk \$49.95

Chinese Juggler
Imagineering
Disk \$29.95

SOFTWARE ON THE CHEAP

Choplifter

Imagineering
ROM cartridge \$29.95

Colossal Adventure

High Technology, Ozi Soft
Disk \$29.95
They say this game will keep you entertained for months!

Combat Chess

High Technology, Gametronics
Disk \$47.50

Combat Leader

Gametronics
Cassette \$46.95

Computer Football Strategy

Gametronics, High Technology
Cassette \$30.50, disk \$35.50

Computer Stocks and Bonds

High Technology, Gametronics
Cassette \$35.50, disk \$47.50

Cops & Robbers

Ozi Soft, High Technology
Disk \$29.95
Avoid the police patrols, rescue the prisoners and collect the diamonds.

Cosmic Tunnels

High Technology
Disk \$49.95

Crisis Mountain

High Technology
ROM cartridge \$39.95

Critical Mass

High Technology
Disk \$49.95

Crush, Crumble and Chomp

High Technology
Disk \$29.95

Cyberworld

High Technology
Disk \$39.95



Cybotron

Melbourne House
Disk \$32.95

David's Midnight Magic

High Technology
Disk \$44.95

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High Technology
Disk \$49.95

Deathstar Interceptor

High Technology
Cassette \$29.95

Dino Eggs

High Technology
Disk \$49.95

Divx

High Technology
Cassette \$30.50, disk \$40.90
Gametronics
Cassette \$30.50, disk \$35.50

Dragon's Den

High Technology, Commodore
ROM cartridge \$30
You are the knight in shining armour who must defeat the dragons and save the countryside.

Drelbs

High Technology
Cassette \$29.95, disk \$39.95

Drol

High Technology
Disk \$49.95

Dungeon Adventure

High Technology, Ozi Soft
Disk \$29.95
Magical Treasures abound in the cavern fortress of the defeated Demon Land. Can you use them?

Dunzhin

High Technology
Cassette \$34.95, disk \$39.95

Eagle Empire

High Technology
Disk \$29.95

F-15 Strike Eagle

High Technology
Cassette and disk \$39.95

Factory

High Technology
Disk \$49.95

Fast Eddie

High Technology
Disk \$49.95

FAX

High Technology
Disk \$39.95

Final Flight

High Technology
Cassette \$29.95, disk \$25.95

Flak

High Technology
Disk \$39.95

Flying Ace

High Technology, Gametronics
Cassette \$47.50

Forbidden Forest

High Technology
Disk \$34.95

Fort Apocalypse

High Technology
Cassette \$29.95, disk \$39.95

Fortress of the Witch King

High Technology, Gametronics
Disk \$47.50

Frantic Freddie

High Technology
Disk \$34.95

Frogger

High Technology
Disk \$49.95

Frogmaster

High Technology, Commodore
ROM cartridge \$30

FT Apocalypse

Imagineering
Disk \$49.95

Galaxy

High Technology, Gametronics
Cassette \$40.90

Gammaron

High Technology, Ozi Soft
Disk \$29.95
Avoid the flying disks and destroy the missile silo on the planet Gammaron.

Gateway

High Technology
ROM cartridge \$49.95

Gateway to Apshai

High Technology
ROM cartridge \$39.95

Ghost Busters

High Technology
Disk \$29.95
Imagineering
Cassette \$29.95, disk \$34.95

Ghost Manor/Spikes

High Technology
Disk \$29.95

Gorf

High Technology, Commodore
ROM cartridge \$30

Gothmog's Lair

High Technology
Cassette or disk \$29.95

Grand Master

High Technology
Cassette \$29.95

Hard Hat

Imagineering
Disk \$39.95

Havoc

High Technology
Cassette \$29.95

Helst

High Technology
Disk \$49.95

HES Games

Imagineering
Disk \$39.95

Hulk

High Technology
Cassette \$29.95

Impossible Mission

High Technology
Disk \$29.95

In The Chips

High Technology
Disk \$39.95

International Soccer

High Technology, Commodore
ROM cartridge \$30
A colour graphics 3-D football game.

Jawbreaker

High Technology
Disk \$39.95

Juice

High Technology
Disk \$44.95, ROM cartridge \$49.95

Jumpman

High Technology
Disk \$29.95

Jumpman Junior

High Technology
ROM cartridge \$39.95

Junior Word Splits

Gametronics
Disk \$45

"Enable may legitimately claim to be the only package you'll ever need"

COMPUTER BUYER'S
GUIDE AND HANDBOOK
November 1984.

... and with Version 1.1, Enable is even better

SYSTEM WIDE FEATURES UPDATE

- Data transfer facility - beyond "cut and paste" - eg a field in a DBMS record can contain the name of a spreadsheet, or a word processing document, or selected records from another data base, enabling automatic display of the "linked" file.
- User designed menus, help and error messages, and pop-up windows.
- Window to DOS to enable execution of DOS functions.

WORD PROCESSING UPDATE

- Automatic indexing and tables of contents.
- Multiple column copy and move.
- Multimate™, WordStar™, EasyWriter™ and Volkswriter™ compatibility.

SPREADSHEET UPDATE

- User configurable dimension using any of 6 shapes - 255 x 255 upto 4095 x 15.
- Automatic conversion of LOTUS 1-2-3™ macros.
- LOTUS 1-2-3™ file conversion is now 20 TIMES FASTER !!!

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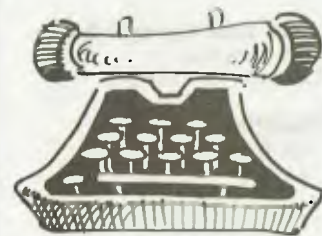
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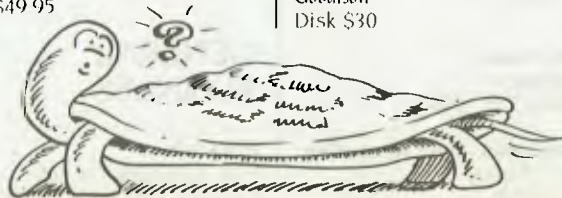
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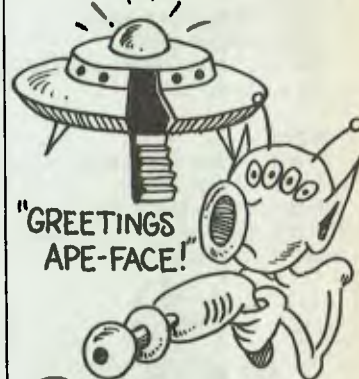
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Continued on page 125

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SECOND-HAND MICROS - Looking for Bargains



Salesmen invariably let it roll from glib tongues with practised ease: "Yes, sir, we can set you up with a system for just five or six thousand dollars." Somebody please tell the showroom smoothies that five or six thousand is not chickenfeed.

But five or six grand seems about the figure you have to look at (unless you can put practice some of the cheap solutions Frank Lee advocates in another article in this issue) if you have ambitions of walking out with a fully-configured microcomputer of a known brand, with a printer.

The only real alternative to outlaying thousands appears to be to look for bargains in the second-hand market. And therein lies a problem.

In the decade or so since the beginning of the PC revolution, the used personal computer market has failed to reach a level of good health for buyers or sellers. In fact, the industry has been too busy with the future to concern itself with creating a well-structured second-hand market for its products. This is perhaps best illustrated

The used-computer market is an unpredictable minefield for the novice, but Peter McKay has discovered there are bargains lurking among the tripwires ...

by those retailers — a vast majority — who refuse to accept trade-ins

The Indy 500 pace of computer technology has likewise knocked the stuffing out of the used market. New technology hits one day and is as old hat as flared jeans the next. Systems purchased six months ago, though they might work like they're brand new, can already be outmoded. And nobody wants obsolete gear.

The industry's relative youth and lack of stability will be rectified in time. It's already happening; the undernourished and ineffectual companies are going — or are destined to go — down the gurgler. Others are simply withdrawing from PC manufacture on economic grounds to concentrate on other areas of the industry.

Some of the estimated 56 different brands of personal computers sold in Australia today don't deserve to survive. This number will certainly be much smaller in five years, and smaller again in 10 as the industry culls out the weak. When the new market stabilises, so — in due course — will the used market. The stability will be long overdue.

Establishing a Base

Picking through second-hand offerings presents plenty of pitfalls, but the bargains are there. And now, at least and at last, efforts to establish a strong base for used micros are gathering momentum.

Computer Exchange has been quietly re-circulating second-hand PCs from its

Second-hand Computers

inner-city Sydney base at Chippendale for several years. It largely operates as a broker, and at any one time 1000-plus micros would be on offer, most of them on consignment.

This is, in Sydney anyway, perhaps the only company to specialise in used micros (and all peripherals). New bankrupt stock at keen prices is also part of the company's bargain basement philosophy.

Computer Exchange's Sid Zamani said he dealt in any brand provided it met one criterion: acceptable standard of technical backup must be available. All Computer Exchange second-hand computers are sold with a seven-day warranty, and longer warranties (service contracts by another name) can be negotiated — at a price, of course.

An example of Computer Exchange value was a 14-month old NEC APC H03, a recently discontinued 1983 *Your Computer* Personal Computer of the Year winner. A desirable unit, as the used car boys are apt to say. It was priced new at more than \$6500, including colour graphics, Wordstar, CP/M, Benchmark and 256 Kbyte memory. Software alone totalled around \$2000. It sold for \$3500.

Zamani says much of his business is with computer-wise clientele, which makes communication simpler. However, he's getting more and more novices through the door, responding to the word-of-mouth recommendation that Computer Exchange doesn't ignore the uninitiated. "We can't offer tuition or assist with any part of the learning process. What we can provide is contact with a network of people who can teach novices how to set up and operate their equipment at a very reasonable hourly rate. They're mainly uni students who know their stuff and are happy to share their know-how for \$5-10 an hour."

Another Sydney outfit, Computer Warehouse, recently staged what it modestly described as the Biggest-Ever Used Micro-computer Sale, a three-day bazaar held at its Gladesville, NSW, headquarters. So encouraging were the results that the company plans more of the same, spreading to other capitals.

Around 30 per cent of the stock at the Computer Warehouse sale was lodged on consignment by private sellers. This high figure certainly suggests many people are having difficulty shifting their gear through conventional channels such as via the classified ads in newspapers.

The rest of the stock was made up of

"Private sellers and company accountants can never believe how much their gear has dropped in value. It's hard for them to accept losing so much money and we often have trouble convincing people that they're expecting way too much."

repossessions and ex-lease equipment, some trade-ins, and unused gear from bankrupt companies.

The Bargains are out there ...

Bargains, while not exactly leaping out from all directions, were to be found at the sale.

One customer and his 12-year-old son — long-time enthusiasts both — picked up an unused 80-column card for their Apple II-Plus for \$45. "These cards — the best type — can cost up to \$160. This is a good one." And what about the rest of the gear on sale? "Yes, there are some great buys here." And did the idea of one-stop second-hand computer shopping have appeal? You bet it did.

As another buyer put it: "There must be half a million micros out there in computerland ... and no orchestrated means of recycling them."

Managing director of Computer Warehouse, Bob Norton, said his company had around \$2 million worth of second-hand micros for sale. That's a lot of micros. He quickly brandished a stocklist showing 1500 used computers. "And we have another 5000 on our books," he added.

Pricing of second-hand gear remains one of the black arts. As Norton says: "The micro market is so volatile and this leads to very low resale ... it's a shock for some people to learn they have much more invested than the current worth."

"Private sellers and company accountants can never believe how much their gear has dropped in value. It's hard for them to accept losing so much money and we often have trouble convincing clients

who sell on consignment through us that they're expecting way too much."

Computer Warehouse's valuer, Frank Barrett, uses as a rough guide the following pricing formula: after six months the equipment is worth 60-70 per cent of its new price; after 12 months, the value drops to 50-60 per cent. Of course, he says, the usual market influences affect the pricing, and rock-solid brands (particularly IBM) tend to hold their value better and longer than obscure, less popular, inexpensive, unstable names. There are other sensible buys apart from IBM, among them Apple, NEC and Hewlett Packard.

The cost-effectiveness of pre-owned micros has encouraged a surprising number of firms to purchase second-hand. We learned of one broker specialising in used gear who had been asked to chase up 10 fully-configured Decmates at a unit cost of \$5500 or a saving of maybe \$3500-4500 apiece — which works out as upward of \$35,000 in total.

As one seller put it: "Computers don't often wear out. They tend to go out of fashion before they clap out." Of the components that are subject to wear, the cooling fan is most frequently replaced.

Computer Warehouse's historical megasale covered everything from used floppy disks (\$1 each) to a new Hewlett Packard 110 — the good old 'unwanted prize' — going for \$4300 with software. New price would have been around \$5500.

Other examples included a demo Sirius 1 for \$3300, IBM PC portable with colour graphics card about a grand below list at \$4800, and HP 87 (two drives, 160 Kbytes and printer) for \$3000 — or less than one-third of the original recommended retail. There was also a six-month-old Apricot 512 Kbyte with 10 Mbyte hard disk for \$5300.

New gear included a Kanematsu dot matrix printer (18-pin head, 180 cps) with a landed cost of \$1600. Sale price: \$480. And Apple Plan 80 software valued at, say, \$800 new went for \$10 still in its pack.

Take a Guide

Cruising among second-hand computers is no place for the computer novice, especially without someone holding your hand. Enter the front doors of Computer Warehouse and the fact is that product advice is likely to be at best scanty, with a modest profit margin of around only 15 per cent the sales staff is aiming for turnover and won't be terribly fascinated by the pros-

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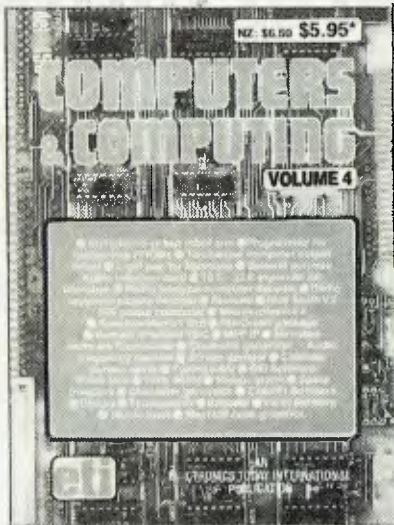
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Second-hand Computers



PACKED SOLID!

"Computers and Computing Volume 4" is packed solid with hardware projects to build, reviews, programmes for a vast array of different computer models and lots of general information. It's just about enough to toggle your input port at its maximum baud rate! Available now through Federal Marketing this book is a must for anyone who is serious about computers and computing.

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Trade Enquiries Welcome

pect of a 40-minute discourse on the computer and you.

At least when you shop second-hand, the original owner has taken the savage depreciation blow. All you have to contend with is the possibility of unsound or superseded equipment and vanishing servicing.

There are anomalies for the unwary. In the last 12 months, new printer prices have all but halved in the face of fierce competition. So someone advertising a one-year-old printer at half-price isn't exactly offering a hot bargain.

On the computer front, the obvious advice to follow is to buy name brands. There are around 150 different micro models on the new market at the moment; more on the used market. Some are about as pleasant as herpes or, worse, a BDOS error. Take Apple compatibles — these Taiwanese copies are in the main not supported here any more and a purchaser can be buying himself a stack of trouble.

Then there are brands such as Sorcerer which went out of production two years ago. Normally, defunct brands are a worry, but Sorcerer is a reasonable risk because of the activity of a strong user group. Remember too that most components — chips, drives and so on — are sourced from common suppliers, which makes parts readily available for even the obscure names. However, finding someone to service some of the less-popular machines could be a painful and expensive experience.

The ubiquitous Commodore 64 first hit the showrooms at around \$600. Now, after figuring prominently in heavy discounting warfare, this recently superseded model is down around the \$250 mark. The people who bought when it was \$600 are going to have no joy offloading their used 64 at half-price!

The Saturday classifieds and (in Sydney) the *Weekly Trading Post* usually list dozens of used PCs and associated gear. Behind every For Sale item is a tale. Bob Norton cites predictable reasons why people unload their micros: "Maybe after a couple of years they decide to update to the latest technology — faster, flashier gear. Others change jobs and require a computer compatible with the office unit. Families also find their kids have lost interest in computers so they want to cut their losses. Different software needs can also force a change. Occasionally we get an unwanted prize still in its box. And there's always those who are strapped for cash."

A gent in Sydney's west recently adver-

tised in the *Trading Post* his genuine Apple II-Plus with 16 Kbyte RAM card and added function keys for \$550. He was not bowled over in the rush. Nearly four years ago he paid around \$2000 for the Apple and an extra disk drive. Now, after hobby and business use, and while still in good condition, it was going to make way for a new IIe. Only one enquirer bothered to inspect the unit, but he departed without opening his wallet. Eventually the Apple went to an acquaintance of the advertiser ... for the asked-for \$550. It was an inexpensive way of getting into a quality brand, although the II-Plus is elderly by today's standards.

Another interesting classified ad read: "NEC APC with NEC pinwriter PI and software, CP/M-86, MS-DOS, dBase II, Microplan, Benchmark, Attache accounts receivable, Version 3, many disks, all documentation from new. \$4000." The vendor, a businessman, bought the gear — \$10,000 worth — principally for an interim accounting role 18 months ago. He'd recently installed a large NEC VS330 and the APC was placed on the market. Six days after the ad appeared he hadn't shifted the system. There'd been a couple of nibbles, one from someone chasing a colour monitor and another person who wanted the printer. Nevertheless, the businessman planned to persevere with the sale.

An undeniable bargain for the right purchaser, the system had done "a super job with not a moment's problem". No wonder he had opted for a big NEC replacement machine. When the micro NEC does go, the seller hopes it'll be to a stranger. "Sell to a friend and he'd be constantly on the phone asking me for user advice."

You Win Some, You Lose Some ...

For every good second-hand deal there's a dodgy one. One optimist put a price of \$1500 on an old Tandy with extras. Two hundred would have been more realistic.

In many ways the used computer market can be compared with the second-hand motor vehicle industry — except that the car dealers are now more closely monitored, prices generally are more buoyant, and cars sold through licensed dealers are under warranty. Obviously the second-hand computer business has a long way to go, and the local distributors must take some blame for not doing more for their customers. The first company to set up a system designed to control resale prices will be on a winner. Meanwhile, bargains are to be found in that second-hand market minefield. Just step carefully. □

These are some of our compatibles



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The HR31 200 Colour Monitor is a direct replacement for the IBM Colour Display. It plugs into the IBM Colour/Graphics Adaptor (or compatible) card. The HR31 200 features **0.31mm dot pitch and a black matrix picture tube**. This special tube reduces glare and enhances RGB colour to ensure superb picture quality.

All three monitors include a tilt and swivel base. Use your Qubie' monitor as you would the IBM, it will in no way affect the normal use or function of your Personal Computer.

Technical Data - HR31 200

CRT Size: 14" Diagonal (34cm)
Tube: Black Matrix
Sync-H. Scan Frequency: 15.7kHz
V. Scan Frequency: 60Hz
Signal Type: RGB I; TTL Level Positive
 Sync H/V: TTL Level Positive
Display Size (H x V): 245mm x 170mm
Retrace Time (H x V): 0.5Ms x 0.4msec
Resolution: 640 x 200 lines
Input Terminals: 9 pin 'D' type connector
Dimensions: 11"(H) x 15"(W) x 13 (D)
 266(H) x 367(W) x 318(D)mm
Shipping Weight: 15.9kg



Model HR31 200



Models HR 39 & HR 134

(All models Right-hand controls only.)

Technical Data - HR 39 & HR 134

CRT Size: 12" Diagonal (29cm)
Phosphor: HR 39 (Green); HR 134 (Amber)
Sync-H. Scan Frequency: 18.432kHz
V. Scan Frequency: 50/60Hz
Signal Input: Video - TTL Level Positive
 Sync - H - TTL Level Positive
 Sync - V - TTL Level Negative
Video Response: 20MHz
Display Size (H x V): 203mm x 135mm
Display Time (H x V): 44Ms x 18.99msec
Resolution: Centre 1,000 lines
 Corner 800 lines
Display Formats: 9 x 14 matrix 2,000 characters in
 80 x 25 format
Input Terminals: 9 pin 'D' type connector
Dimensions: 10.5"(H) x 15"(W) x 12"(D)
 257(H) x 367(W) x 294(D)mm
Shipping Weight: 11.36kg

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Business

Paperwork Overload — Problems Solved 76

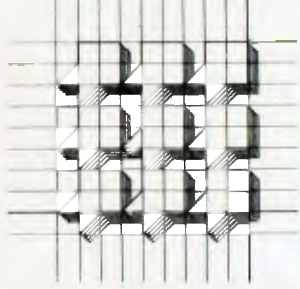
Paperwork for an architectural project can be overwhelming, but installation of an efficient word processing system can simplify its production considerably. One Sydney architectural firm found a Burroughs system that relieved a great part of the burden.

Viatel Grapevine 85

This month Norman Kemp discusses low-cost access to Viatel, and describes more Viatel products appearing on the market — some of them designed and made in Australia.



Rice and Daubney Architects Planners



PAPERWORK OVERLOAD

- Problems Solved

BY NORMAN KEMP

An architectural office produces an overwhelming amount of paperwork during the course of a project, and one of the most important requirements of a computer system in such an environment is its ability to simplify this task with efficient word processing. Other basic tasks, as in most offices, are spreadsheets and database management; the technical and architectural packages available are just the cream on the cake of efficient office management. One Sydney architectural firm found a Burroughs system capable of handling all these tasks.

ARCHITECTURE in the 1980s is a highly diversified profession, and its practitioners have to respond quickly and creatively to a variety of conditions for which they require a massive store of well-organised and easily accessible information. Using computers can save technical staff time-consuming effort and costs in rapidly making available necessary material, and computers also offer new problem-solving techniques as well as helping to maintain efficient management on expensive projects.

A building is rarely constructed according to its early design concept — each part of the documentation process is constantly subject to reappraisal, new drawings are made on almost a daily basis, and plans may have to be altered because of changed legislation, unknown terrain problems or client's whim. Costs of materials may mount, delays can upset schedules and estimated completion times, and some of the forthcoming technologies being developed for both the small office and the large corporate blocks of the 1990s can make demands for requirements that were not foreseen in earlier years.

Since the architectural profession regained momentum after the recession of a

few years ago, planning and construction projects for new buildings have become more complex, and require increasingly comprehensive skills, particularly in the area of safety standards and environmental protection. This has led to a vast build-up in demand for up-to-date planning and design information, and paperwork prepared for the large-scale documentation of projects tends to be generated in almost overwhelming volume.

Over the last twelve months one of the top architecture and planning consultancy practices in New South Wales, Rice and Daubney, has launched an intensive computer program to support its overall architectural and office administration requirements. Formed in 1975, the North Sydney firm has as its directors its two founders, Kevin Rice and John Daubney, together with two later appointments, Ross Gardner and Malcolm Carver, and five associate directors, working in an office that has completed 120 projects in ten years. They head a young and vigorous practice which has a total staff of 80, most of them architects, and are committed to projects with an accumulated value of \$350 million.

Many of Rice and Daubney's architectu-

ral works can be seen in the centre of Sydney, including a distinctively colonnaded multi-million dollar tower on the corner of George and Bathurst Streets, which will blend with the modern style of St Andrew's Square in the heart of the city. Nearby the company is associated with another firm, Stephenson and Turner, in carrying out the complete restoration of the Queen Victoria Building. Large suburban projects include the twin-tower Chatswood Chase complex, and a 26,000 square metre 25-storey retail and office development in Walker Street, North Sydney. Among the company's other activities are an assignment as planners for the redevelopment of the Reschs Brewery project in South Dowling Street, residential and industrial constructions, and a hotel/motel tourist site at Merimbula, in southern New South Wales.

Planning and Development

The planning and development for the computer system started in March 1984, and has been headed by the firm's director of technology, Malcolm Carver, and systems analyst, Albert Chia, who also has a background in architecture.

"There is very little architectural software available at present for any system, and while we are an architectural firm we recognised that we are also running a commercial business," Malcolm Carver said. "Therefore we started by looking for software that was common to other businesses, such as word processors, spreadsheets and database programs."

Requests for proposals for hardware were sent to a number of companies, among them several minicomputer suppliers. "At the time there were very few computers in the microprocessor-based category that had growth potential in a multi-user office, nor could we define our full needs for terminals or how large a system we required. Essentially we wanted a system that was up and running and proven in a commercial environment," Carver said.

After about four months' study, and as ideas clarified into action, the company eliminated minicomputers. partly on

grounds of price but mainly because those products did not have the required software base for future expansion.

Major considerations were a multi-user environment with capacity to service up to 32 workstations, facilities for sharing common peripherals, programs, files and databases, and a powerful word processor suitable for lengthy documents. Other criteria were a preference for a single well-established supplier with a proven track record in commercial applications, offering technical support and training, compatibility with mainstream operating systems and programs, and a flexible growth potential.

"We placed a great deal of emphasis initially on setting up word processing, effectively making use of the powerful functions suited to complex specifications and report work," Carver said. "The system had to be a big word cruncher as the office basically produces documentation and design information. Most of the terminals are in full daily use, which was a major reason for needing to be able to expand.

"We subscribed to the philosophy that the computing system should cater for both the architectural and administration needs consistent with a general move toward system integration," he said. "However, it was planned to mount the administrative applications first as these were already well established. We also favoured the philosophy of using the initial installation as a building block which could be expanded and upgraded to meet future needs, in contrast to meeting present requirements only with the prospect of having to change within three to five years in order to keep pace with business growth and technological development. We recognised that the real costs in changing systems are many times the cost of the hardware component."

Choosing from a Short List

From a short list, Burroughs Australia won the contract and by August 1984 Rice and Daubney had installed an initial modular system based on five B20 series and B25 cluster workstations, a 20 Mbyte hard disk drive, one floppy disk, and daisywheel and dot matrix printers. Following the addition of more workstations and printers, a Burroughs XE 520 Shared Resource Processor (SRP) was acquired to act as the master file server, providing file and communications resources to 11 individual cluster workstations and printers. The SRP has a 37.5



Mbyte Winchester mass storage drive and a 5 Mbyte removable hard disk backup system. The addition of a 270 Mbyte SMD is planned for the latter half of this year, to support expanding database requirements.

Although MS-DOS is provided, the main operating system is Burroughs' proprietary BTOS, to which the main applications programs have been adapted.

The programs used are Burroughs' Writeone word processor, Data Manager database, Microsoft Multiplan spreadsheet, and BASIC Interpreter. The word processing handles general office correspondence as well as sample specifications and planning reports; the database is used for job register, projects file, staff personal records, details of submissions and library functions; and the spreadsheet for financial modelling and architectural and transaction processing applications. One of the major internal programming jobs was a conversion of software for the Australian

Building Industry Specifications, a document of some 800 pages, to run with the Writeone word processing.

"Users can have four or five specifications running at any one time, depending on the demands of the practice," Carver said. "There could be four operators working on large documents using 14 Mbytes simultaneously, particularly when ABIS is in operation. ABIS is a standard set of specification clauses for the building industry, which are combined using cut-and-paste word processing procedures to produce building documentation. Documents may vary from about 200 pages for a small project to more than 500 for a large one."

Carver said that when the administration applications were finalised, the next development would be in the financial area, to be followed by such architectural applications as tracking documents and contracts, and keeping details of costs during project administration. He added that although the system has capacity for com-

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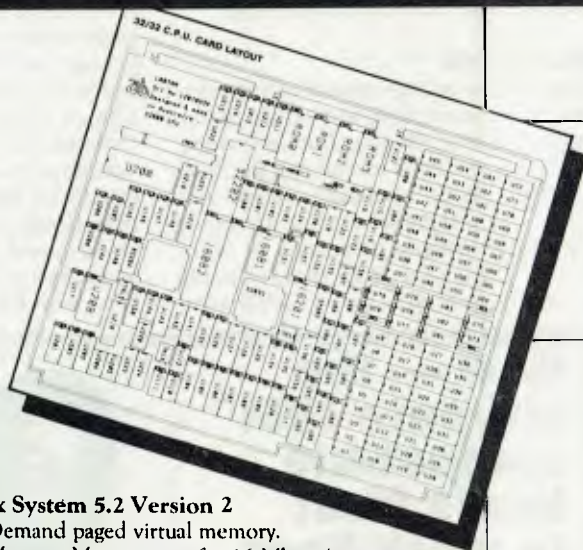
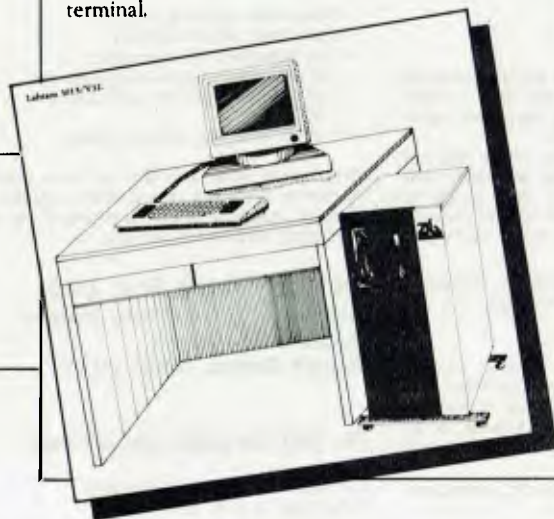
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puter-aided design (CAD) it was not proposed to provide that facility at this stage.

Carver added that the company had not been convinced it was necessary to put a workstation on every architect's desk. "They are on the desks of those who can type — in other words those of our staff actually employed as typists," he said. "We have a technically oriented operator who devotes a substantial portion of her time to word processing development and training. We also have specialised ergonomic keyboards that help operators access information and drive the system, rather than the usual data processing type."

Macs on Trial

As part of continuing research into its system development, Rice and Daubney has purchased three Macintosh microcomputers for experimental use among the staff. "Technical people preferably should not have to use a keyboard at all as they only need a few simple directions or commands," Carver said. "They should be able to input their information on such devices

as a touchscreen or with a mouse. Computer software has been written by experts in esoteric languages for themselves, creating an enormous barrier for the people they are trying to sell to. Once people have a computer on their desks they want to be able to interface with it easily and not through some complicated program which they may have difficulty not only in learning but also in remembering. If an application is too difficult, users may well go back to the calculator and do their work manually."

The trial with the Macs will enable the firm to evaluate their practicability in both graphics processing and communications through an RS232 port for Multiplan files and financial management. "There may be a future in that," Carver conceded. But he contended that the Macintosh keyboard is not suited to a typist. "She or he would be frustrated beyond belief with needing three hands, one for the mouse and two for the keyboard. On the other hand, hardware and software manufacturers must come to grips with the fact that technical people

are never going to be taught to type at the same rate as a typist, and *they* find a keyboard an inhibiting factor in getting the most out of a computer; there's room for both the Mac and more conventional computers, depending on the application."

Carver said that Rice and Daubney was not concerned with the lack of third-party software for any system that adequately met the particular and specific needs of its architectural practice, but it was prepared to give consideration to packages which could be adapted. Rice and Daubney has therefore pooled resources with two other large architectural practices which are also users of Burroughs systems, for the joint funding of software development. This group is currently negotiating with software houses for the writing of a job costing module that could supplement the present accounting package.

Summing up, Carver said, "We expect our present system should be able to service our needs well beyond 1990, and that it will be able to grow to meet new demands as the company expands." □

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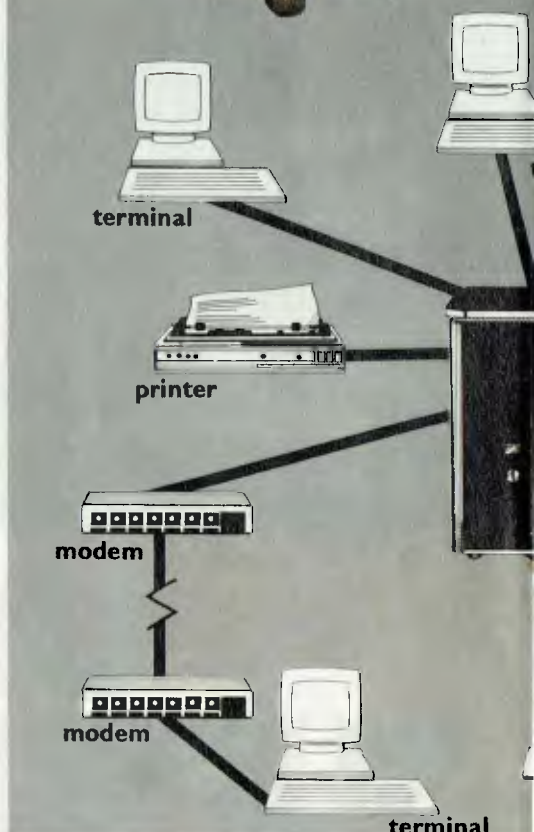
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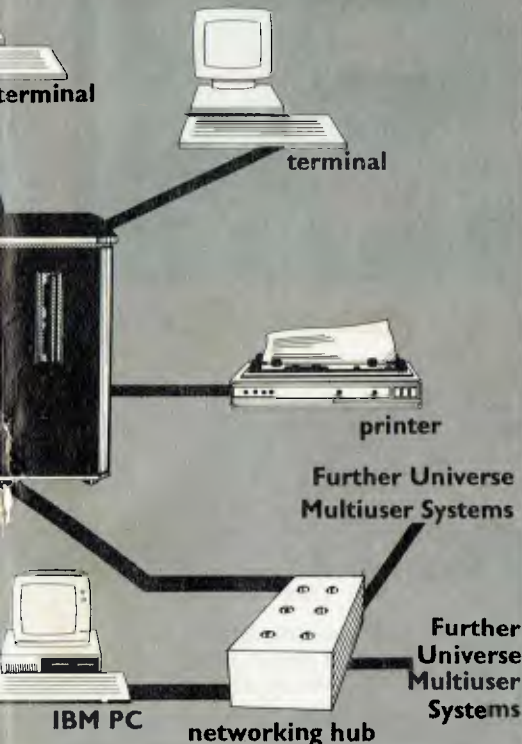


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Low-Cost Access to Viatel

It may be cheaper for personal computer owners to buy a keyboard, terminal and software package from a High Street dealer which can virtually plug straight into the service than it is to convert machines for Viatel. The growth of videotex services overseas has led to the development of a number of products, some of which are now being imported into Australia specifically for Viatel and are relatively cheap. As demand grows even cheaper terminals will probably be available, but it looks as though prices of communications software will remain stable.

A word of warning about software. Some of it is so copy-protected the user can't even make a single backup for protection. One company said it would probably be prepared to sell a separate copy on proof of purchase of the original if it was corrupted or destroyed, but had not yet worked out a price. In other words, a renewal could cost almost as much as an original. This is unacceptable, and intending buyers should find out whether software has been protected in a manner which would prevent a second copy being made before paying for it.

Suppliers might have nightmares about young enthusiasts making free with diskettes to friends and user groups, but should realise new users are likely to make mistakes which could seriously or terminally crash their program, and shouldn't have to rely on a single uncopyable disk. Nor should they have to pay an exorbitant rate for renewal.

This is important for software produced specifically for Viatel. Most personal computer owners are aware of or have access to public domain communications software, and aren't likely to have difficulty replacing it. But the programs for the 1200/75 baud Prestel-type Viatel videotex service have all been specially commissioned and, as far as is known, there are no software writers or developers in Australia who have been philanthropic enough to put this kind of system on bulletin boards for free downloading. So Viatel/Prestel is a highly commercialised facility without the freebies that may be available on other services, and the user can expect to be charged at the going rate for any software.

The vendor obviously has the right to copy-protect, but not every supplier does this, so a bit of shopping around could be rewarding. Make sure, however, that the software runs efficiently on your particular

system before parting with the cash. User groups may be able to buy certain packages for resale to members at a discount, and can certainly advise on the type of terminal to be used.

How much will a commercial system cost? The answer depends on the type of equipment used and the level of the user's requirements, but for starters should come to less than \$500. For this the user can buy a kit to suit several of the well-known brands of personal computer, and the communications software. About \$700 should cover an elementary terminal with Viatel modem and software, and prices go up according to whether editing, colour graphics and multi-faceted modem facilities are desired. Some firms sell adaptors to television sets for cheaper connection, but the quality achieved is rather primitive and disruptive to other TV viewers. A regular user is likely to upgrade within a few weeks, so it would be better to start with the more effective system in the first place!

New Products

Among the latest batch of overseas products scheduled to be available in Australia from July is the Xyllx range from the UK, supplied by Rank Electronics of Sydney. Xyllx is a major developer and vendor of public access terminals, and has produced kits for several personal computers. Eight will initially be sold in Australia, and other brands are under consideration.

The cheapest is the Commodore 64 pack, retailing at \$210 and comprising a communications cartridge which plugs into the machine's extension port; a connecting cable to a modem is extra. An Apple IIe kit will sell for \$405, and comprises a communications card, floppy disk with programs and connecting cable. The BBC Acorn has an economical \$188 ROM pack with cable which plugs into the main board of the computer. An Apricot system for \$375 consists of a communications card and cable, and for the Tandy III a ROM chip is priced at \$265. The kit for the IBM PC is priced at \$375 and is made up of a floppy program disk and cable, with an optional \$140 graphics chip exclusively for Prestel. A Sirius kit is similarly priced, but doesn't have the Prestel graphics chip. An Atari 800 kit is also being launched for \$265, but details aren't available yet.

Rank Electronics marketing director Len Adelman said the software would be copy-protected, but backup copies will be available to individuals and user groups. He

added that kits for some other makes of computers such as the Apple IIc and Macintosh could be obtained from overseas if required, and would be stocked in Australia if demand were sufficient.

An Australian-made universal modem that will match all the kits is expected to be on sale from this month, he added. Designed and produced by Sendata of Melbourne, under contract to Rank Electronics, it will sell for \$313, and include a common socket for telephone and computer. The modem will have speeds of 300/300 baud for computer-to-computer operation and 1200/75 half-duplex for Viatel. Rank Electronics is planning to sell its products through retail outlets and not direct to customers, but may make special arrangements between user groups and dealers.

Local Trio

A recently formed Melbourne group called Trident Computer Systems has homed in exclusively on the NEC APC III (with a possible development later for the Olivetti M24) with a locally written software package which retails for \$140 and is not copy-protected.

Trident is an ambitious venture by three computer professionals who left other jobs to set up a specialised business systems dealership, and became interested in videotex. The trio is made up of Peter Worth, formerly with the Monash University computer centre; Alistair Minson, a civil engineer with an accounting background and formerly a systems programmer for Mobil; and Mark Rak, who has a diploma in computing and was previously with the Myer Emporium computing services division.

They have devised a Viatel Interface Program (VIP) written in Pascal, which features data capture and conversion to ASCII files and is designed to facilitate the transfer of information to word processing and spreadsheet programs. "We believe there is a great future for Viatel and are trying to keep the prices down to encourage new users," said Worth. "The software also has a number of features we haven't found on other programs to help the computer keep track of directories and filenames and to redirect information."

The VIP program uses the qualities of the NEC APC III high-resolution screen to run monochrome graphics, but differentiates colours in various shades of grey. A Hayes-compatible modem is being manu- ▶

factured for the system by Consolidated Electric Industries of Melbourne, to sell at \$600.

A ROM pack which converts a Commodore 64 into a full Viatel terminal with editing facilities and can keep 16 pages in memory has been released by Megavision of Sydney. Managing director Rudi Hoess said the package was developed by the Swedish electronics company Datatronics, and had a potential sale to more than 200,000 Commodore 64 users in Australia. With a 300/300 baud and 1200/75 baud modem, the system sells for around \$300. The modem is powered by the Commodore and attaches to the external user port.

"Products for Viatel should be priced in keeping with the equipment they are to be used on," said Hoess. "It's ridiculous that for computers costing about \$400 the additions should be more expensive than the original machine. There is a price limit to acceptability, and for a Commodore 64 one

should not expect to have to pay \$1000 to add a new refinement to it."

Hoess's future plans include the possibility of adapting the Japanese eight-bit MSX computers to Viatel requirements. "The market will not accept these as being exciting enough just as computers, and their technology is too late for that purpose," he said, "but they have potential as very high-grade terminals. If a modem were integrated with them they could suit a lot of office purposes. People in offices don't want to string things together like spaghetti any more, and these are the type of units that could be developed with an on-board modem to suit their needs. The cost of development initially would be very high, but could fall dramatically as demand increased, and they would also be suitable for local manufacture."

Before the end of the year there will be more products on the market which will enable users to gain access to Viatel with

relatively low-priced equipment. At the end of June Telecom had more than 3000 registered users on the service, and this number is expected to continue to grow at a steady pace throughout the year. Local manufacturers are keeping a watchful eye for opportunities to market practical, budget-priced modems and software for users who want to access the service and skip through the databases and download software.

Editing terminals and keyboards are obviously more expensive, but considerably cheaper than most popular business computers. Some forms of public access terminals for banking, shopping and general information may also be introduced in the near future by enterprising businesses. These will open the way to wider applications of Viatel and provide a variety of resources at a shared cost, which could become the cheapest form of access to the service. □

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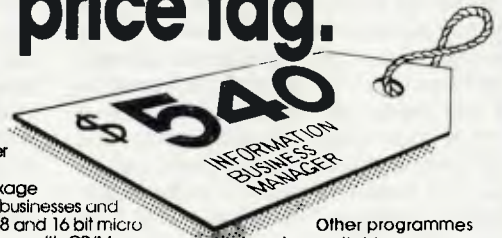
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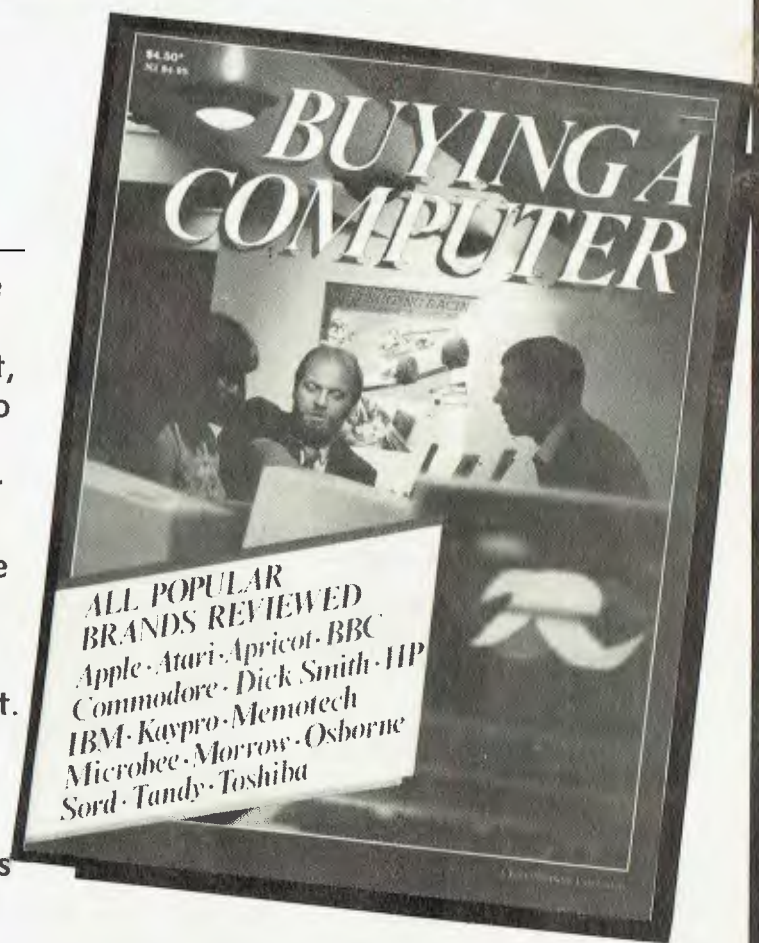
BUYING A COMPUTER

When you produce Australia's best monthly computer magazine — 'Your Computer' — the most frequent question you encounter is "Which computer should I buy?"

There's no simple answer to this — it all depends on what you want to use a computer for, how large a task you have in mind, where you want to use it, and much more. But people still ask, so it seemed a good idea to collect together in one volume a large number of reviews and reports on Australia's most popular computers, so that people can read all the evidence side-by-side and form their own judgments.

'Buying a Computer' is the result. In it are reviewed more than 25 computers available in Australia, divided into three sections covering personal computers, business computers and portables. Everything from the Cat to the various Apples is covered, passing through such wonders as the Apricot, Rainbow, cash 'n' carry crowd — and of course the ubiquitous IBM. If it's available in Australia, the chances are it's reviewed in 'Buying a Computer'.

In addition to the reviews are several general articles covering advice on what to consider when buying, learning fast when you're thrown in the deep end, a price list of computers ranging from \$280 to \$20,000, and



descriptions of 1984's eight 'best' computers as judged in 'Your Computer's' Personal Computer of the Year Awards.

If you're thinking of buying a computer, for business or personal use, 'Buying a Computer' is indispensable. It's the only way you'll get an objective opinion on just about every computer on the market.

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CREDIT WHERE CREDIT IS DUE

I would like to bring to your attention an error in the April 1985 issue of *Your Computer*.

On page 215, Peter Lynden stated that the program developed for the TEXPAC BBS was written by Robert Crago. This is untrue.

Robert Crago developed a program that was, in my view, totally unable to function as a decent bulletin board service. There were many errors and no password security whatsoever.

I rewrote the TEXPAC BBS to what it is today, adding an editor, password and membership number security, and making the program more presentable.

I am angry that credit has not been given to me, and gather that Peter was misinformed about the programming of the system.

Also, my own BBS, DATEBBS, has been around as long as the Keeboard BBS and is very popular. DATEBBS is a matchmaking bulletin board service with over 150 active members, and has brought several couples together. I notice you have not included it in your recent PAMS listing.

You may also be interested in a little background information concerning the TEXPAC BBS. Shane Andersen is currently selling the program, and if my information is correct, 50 per cent of the profits are going to the club and the rest is going to Robert Crago, the so-called programmer of this system. Although TEXPAC BBS still uses the original machine code I/O for the program, the BASIC part of it (about 90 per cent) is my work and I feel your readers should be informed of this, as I look upon it as piracy.

I congratulate you on an otherwise well-documented publication which I always look forward to buying.

STEVEN WILLIAMS
St Peters, NSW

We stand corrected on the issue of the TEXPAC BBS. If you'd like to send us details of the DATEBBS we'd be happy to add them to our PAMS listing.

CONGRATULATIONS, WITH RESERVATIONS

I would like to congratulate you on the April issue of *Your Computer*, it was excellent. I was just about to discontinue my subscription to the magazine, but you have lifted me up again. An outstanding issue and all concerned ate to be congratulated.

I particularly like the Kaypro segment and the beginning of the series on Structured Programming in the Instruction Set section. A month between articles on structured programming is a very long time. Would it not be possible to publish a four week lift-out each month? This would give one something to work on, and keep the interest up. I think we're very lucky to have Mr Grouse contributing such articles.

While I'm singing your praises, I'll take the opportunity to make the odd complaint. First,

the review of the President 16-210: it appears the author of the article is a little biased. My personal experience with President is such that I would never purchase a pin from the company. Its technical support leaves very much to be desired, not only has the staff never answered the four letters I wrote, it has also failed to answer telephone calls.

Incidentally, as Secretary of the Australian Capital Territory Kaypro User Group (ACTKUG) I have not yet met a person who has had satisfactory response from President in the technical area. If the nine-out-of-ten rating given President by your review for support refers to technical or administrative support, then the article is a joke.

Second, I am also disappointed that you made so much of IBM in May. In the micro-computer field I feel this is a firm that gives very little for a lot of money.

Red Hill, ACT

We apologise for not being able to supply the name of this person. His or her original letter had two parts, one of which required the attention of another department. When we sent it there the name went with it, never to be found again. We thought this half of the correspondence was worth publishing, anyway.

HEARD OF THE BINARY GOD?

It seems *Your Computer* magazine has been replaced by a book. I got a card in the mail saying there was a parcel to be collected. You guessed it — it was your magazine!

I recently had an interesting experience in my dealings with Applied Technology, which I'm sure other readers will envy.

I'd been using my Microbee for three years, during which time it survived numerous soldering attempts (I learnt to solder when building my Microbee), major structural changes (the RS232 I put in didn't fit through the case backing, so I got a heavy weight and dropped it on the case), and carefree use (throwing it into a bag and cutting it around school, for example). But the other day my Microbee finally died its last death. It just wouldn't go — no matter how hard I hit it! As a last resort I sent it to be repaired, and told them that while they were at it they could give me one of those new cases. (I got a piece of mouldy black plastic with mine, which was the 84th Microbee ever made.)

Well, six weeks later, after numerous phone calls (the 'we'll call you back' type), it turned up. I looked at the receipt: "Description of service. Remove TI sockets/supply new case. Cost: \$65".

That's not too bad, I thought. I wouldn't have a clue what TI sockets are, but who cares. Then I looked at my machine and found they'd pinched my speed-up switches! I had a look inside (gee, the new case has a lot of screws), and lo and behold I found a brand new computer, complete with WordBee — yes, I used it to write this — the Telcom pack,

colour BASIC (but no colour) and all the rest. Not bad for \$65!

What I think happened was that the technician assigned to my computer tried his best for five weeks, then started to see things and hear bells and so on. So one night he snuck into the factory, stole my computer and sacrificed it to the binary God (ripped it into two pieces, then four then eight ...). Next day he said, "Oh golly gosh. It is gone, and I had almost finished fixing it." So they were forced to give me a new one. Well, I'm not complaining!

RICHARD LARKIN
Dee Why, NSW

A WORD FROM THE MANUFACTURER

JRT Software produces a program called Flashprint!!, which allows WordStar users to design and print graphic characters (and other things) from within normal WordStar documents.

Some users have complained the program contains a bug. So far, touch silicon, none have been found, but I would like to explain where the problem lies.

The difficulty is with dot matrix printers: many of them will not print a bit image graphic character containing a value of decimal 9 — an ASCII tab. For example:

```
10 FOR I=1 TO 1020 LPRINT CHR$(27)+
'S000!' +CHR$(9)30 NEXT
```

should print a line 10 dots wide containing a dot in the fourth and fifth rows from the bottom, but it doesn't work on our C Itoh printer. The Epson equivalent:

```
20 LPRINT CHR$(27)+ "K" +CHR$(1) +
CHR$(0) + CHR$(9)
```

sends our Epson lookalike (an EN-P1091) scooting off the page.

It seems the ROM in both printers has faulty logic, which runs a bit like this: 'If character is tab then print tab and if in bit image mode print bit image value.' It should be: 'If in bit image mode print bit image value else print character.' We know of no solution other than replacing the ROM.

JAMES R. TUCKER
JRT Software
Coromandel Valley, SA

CALLING ALL WIZZARDS

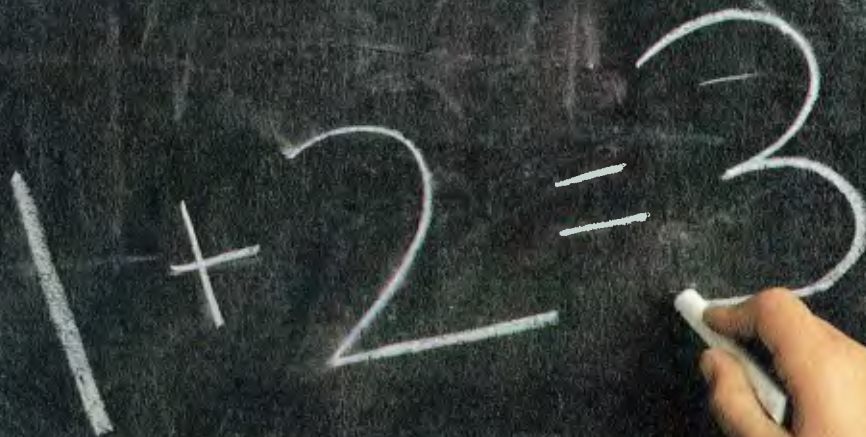
I own a Dick Smith Wizzard and would like to swap programs with someone. The only problem is I don't know of anyone to swap with. As you probably know it is very hard to get software for my machine, even from Dick Smith. I'm getting tired of being the only one to write software and having to swap it for my friends' programs, which are usually out of books.

If anyone out there in Wizzard Land wants something original, and has a decent program to swap, write to me at:

3/7 National Ave, Bulli 2516.

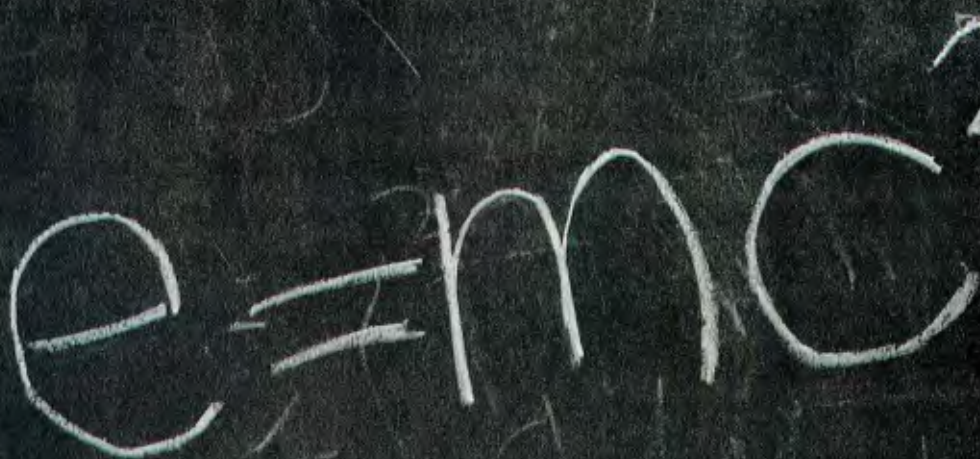
I. POSPISIL

There are basic steps.



A hand wearing a red watch is writing the equation $1 + 2 = 3$ on a chalkboard. The numbers and symbols are drawn with white chalk. A yellow eraser and other pieces of chalk are visible on the ledge below the board.

There are quantum leaps...



A hand is writing the equation $E = mc^2$ on a chalkboard. The letters and symbols are drawn with white chalk. The background of the board shows faint, scribbled-out marks.

Reviews

Enable — A Superior Integrator 93

Enable joins the integrated market at a time when it seems already swamped. Frank Lee put it through its paces to see if it stood a chance in this competitive area, and was impressed enough to write two articles! This month we present the first.

HiFinance 3 96

Hisoft's latest accounting package has several features — such as full auditability — which set it apart from many of its predecessors. Les Bell put it through its paces and was impressed.

T/Maker 102

The IBM PC market abounds with integrated packages, but integrated software for CP/M and MS-DOS computers is rarer. T/Maker approaches this market, with the small business application particularly in mind.



Introducing the Sinclair QL. A Quantum Leap in Small Business Computers.

In today's business world, just keeping a step ahead is often not enough.

The difference between success and failure can depend upon your ability to see far into the future, to anticipate needs and calculate costs. That's why the personal computer has become one of the most important tools in business. A good one can help you understand what lies ahead.

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MCM2004B

Who says business and pleasure don't mix?

With the introduction of the CPC664, Amstrad has stolen a further march on its competitors in the home and personal computer market.

Featuring a built in floppy disc drive mated to an improved version of the popular CPC464 computer, the CPC664 incorporates both AMSDOS and CP/M* operating systems.

You also have the choice of a full colour or green screen monitor

system tracks attached. Other improvements include a light yet positive membrane keyboard, a regrouping and restyling of the keypads and much broader sound and graphics capabilities.

This means the CPC664 not only offers greater scope for entertainment and educational uses, but it also meets many serious business requirements.

Software you can really get your teeth into.

The system comes complete with an introductory disc covering both CP/M and Dr Logo. In addition, almost all existing CPC464 programs run on the CPC664. Add to that Amstrad's own range of disc-based CPC664 software and the excellent range of custom CP/M programs available already, and you have a system that breaks a lot of new

ground for both home and business users.

There's a vast range of games and educational programs from Amstrad and Melbourne House, plus serious business programs like

AMSWORD, Masterfile, DEVFAC, Entrepreneur, Micro-spread and Amstrad Business Control System, to name a few.



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and there is provision for a second disc drive and data cassette recorder to be connected to the system.

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Programs are loaded in a fraction of the time that a cassette takes and cataloguing is instantaneous. Both sides of the disc can be used, each offering up to 169K of formatted space, with CP/M



AMSTRAD

ENABLE: A Superior Integrator

BEHOLD ENABLE. Word processing, spreadsheet, DBMS, graphics, telecommunications and windows in a fully integrated system. Sounds familiar? It should be. Enable, from the Software Group, is the latest in the rapidly growing group of integrated software systems.

Although conceptually linked to Lotus, Symphony, Framework and Open Access, it represents a marked improvement over its predecessors in its ability to transfer information easily between the various system components. Each of its subsystems functions well as a separate item, but information can be readily piped between other subsystems as the need arises.

Presentation

Enable is supplied as a set of six manuals in a box roughly the same size as those supplied by IBM, Microsoft and DRI. The individual manuals have soft covers and are 'Spirax' bound. The documentation is well printed, although I found the presentation slightly annoying. Each back cover has an extension designed to serve as a page marker and spine identification. Because it is rather stiff, it tends to get in the way when working through the manual.

The most important of these booklets is labelled 'Getting Started, Quick Reference, Customer Support Plan and Diskettes'. Its first page shouts "Before attempting to run Enable, please do the following:", THEN TELLS YOU TO READ A SMALLER BOOKLET, 'Getting Started', which in turn refers you to a file, INSTALL.TSG, and two afterthought files named ADDITION.TSG and PRNTPSPEC.TSG.

These last two are Enable's equivalent of the ubiquitous READ.ME file in which most software distributors include information which was compiled too late for the press. INSTALL.TSG runs to 12 printed pages and gives details for transferring the system from the five supplied diskettes to a subdirectory on your hard disk. Instructions for floppy-disk-only machines are also included. This file also provides detailed instructions for starting up Enable.

It worried me somewhat that it took

Yet another integrated package? Enable joined the Lotus rivals at a time when the market looked swamped. After putting it through its paces, Frank Lee felt it was worthy of two articles. This month he examines the overall presentation of the package and the Word Processor Subsystem in particular. His next article will discuss the remaining subsystems.

three full pages to explain all about starting the system. Indeed the bulk of explanatory material was something of a minor concern. The other files mentioned above were just too large to bother listing. Instead I displayed them with the MORE command, and hoped some of the detail would stick. Still, we battled through, and now the whole Enable system is installed in a subdirectory on Ronald's (my President 16-210) hard disk.

Firing Up

Once inside the Enable subdirectory, the system is started by entering the command 'enable' followed by an optional list of disk and path parameters for the various components of the program. Four such parameters may be specified, and defaults apply if any are omitted. The first three parameters specify the location of the system, operation and tutorial disks respectively. The fourth defines the location of your data files and the system 'profile' (see below).

To save all this massive typing exercise whenever I use the system, I invoke a batch file called E.BAT which has the single command: enable (.,c:). This has the effect of using all the files in my current directory, and the system disk in drive A. Like most copy-protected (yuk!) software, Enable requires the presence of a system disk at start-up time in order to unlock the rest of the system. A spare system disk is supplied as a form of security should the original

lose its flavour.

If your machine has more than 256 Kbytes of RAM (Ron has 512 Kbytes), you can also append 'M' after the previous command, to minimise disk switching. This is really designed for users with two floppy disk drives, but I suspect it would improve the response speed for hard disk users. As it stands, the various system components work very quickly. Scrolling on the word processor is particularly rapid.

Profiles

A profile contains settings which configure Enable to suit your particular hardware. The file PROFILE.SPR holds a library of possible profiles, including the standard default profile. The required profile is selected by name when signing on.

The profile is used to specify the monitor type, printer and plotter. It also determines the 'Page Form' (printer specification), the way special text displays on the screen and the default characteristics of the word processor. It is a relatively simple matter to revise existing profiles, or to add new profiles to the library.

One thought kept recurring: Why don't I have to do this with WordStar? Wouldn't it make sense to 'install' the Enable system using a one-off installation operation?

Printer Problems and Hotline Help

Each profile includes a detailed specification for the intended printer. When creating or updating a profile there is a menu of

19 popular printers from which to choose. Unfortunately, there is no provision for specifying the characteristics of a printer which is not listed.

Like many Australian users, I have a lookalike rather than the 'real thing'. In my case, I have a Letter Writer SP 2000 daisy-wheel printer. This is the popular Japanese Uchida mechanism in one of its many external guises. It is reputed to be 'Oume compatible'; up to this point in time, it has been just that. When installing it for WordStar, I simply specify Oume Sprint 5 and it works just fine. But when I select the Oume option for the Enable profile, it does strange things: like printing a 66 at the start of the page.

When using the Graphics Subsystem, Enable would display beautiful graphs on the monitor screen, but I just couldn't find a printer selection which would suit my Star DP 515 dot matrix printer. The only way I could print a graph was to use the PrtSc key which funnels the screen via a resident graphics program to the Star. This approach worked just fine, but uses software external to Enable.

Time to call for help.

Now here's something which didn't come with my WordStar — a local hotline service. Included in the Getting Started manual is a plasticised card labelled Customer Support Plan. Surprise, surprise, it's a local call to OptSoft in Crows Nest — not an ISD call to the Enable producers in Ballston Park, New York. This is a hotline which really works. They called me back (to save my STD dollars) and gave a very knowledgeable explanation. It seems in the next release of the system, they plan to add many more printers, and to include a facility which lets me configure for my oddball Uchida. I got the impression the guy at the other end really knew his product.

The Customer Support Plan also mentions that the registered user is entitled to one free product update with significant features and enhancements, plus a complimentary copy of the Enable Newsletter.

Opening Menus

With all the installing and profiling done, I turned my attention to real work. Figure 1 shows Enable's Sign On menu. The time and date are derived from the DOS values. Since I have reconfigured my default profile to suit an RGB monitor, I simply press the 'End' key at this point to proceed directly to the main menu, which is shown in Figure 2.

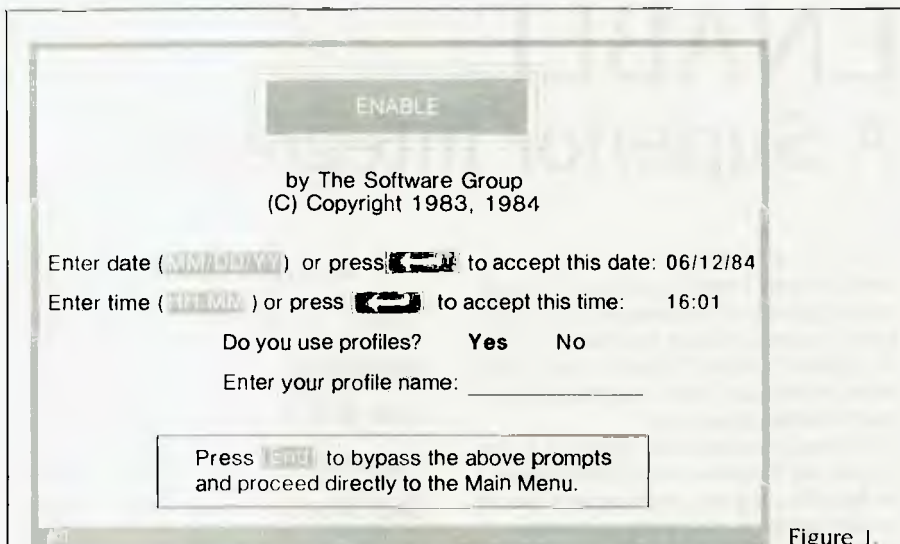


Figure 1.

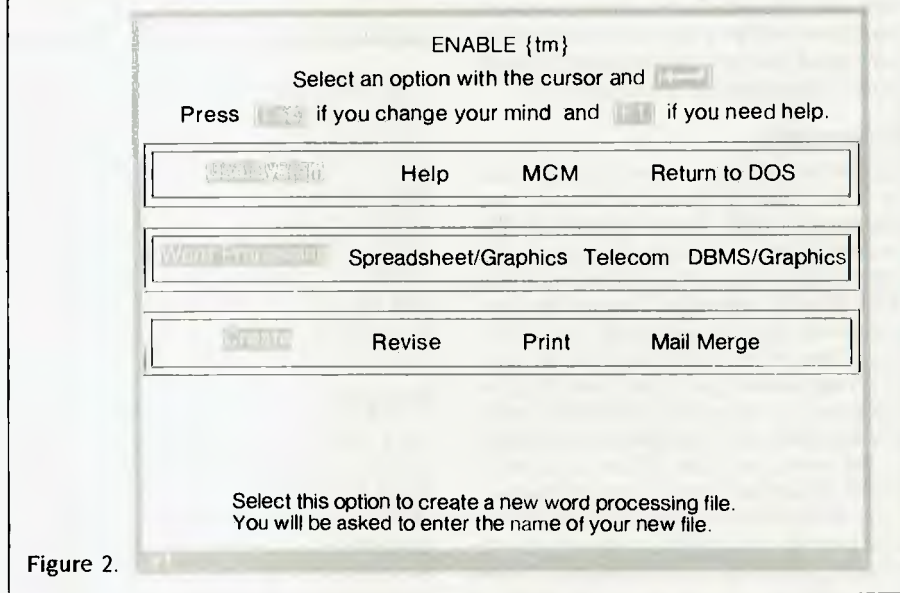


Figure 2.

As shown, I have selected the three highlighted options in order to use the word processing package. Had I chosen Help (from the top line) I would have been able to select between the tutorials and the Customer Service option. In common with many recent systems, the process of option selection is similar to that used originally by Lotus 1-2-3. (Incidentally, the Customer Service option simply gives a couple of 800 prefixed numbers to dial in the United States. Surely not difficult to reconfigure for Australia?).

It is possible to select from a number of

interactive tutorials in the opening menu. These are actually macro programs handled by the MCM (Master Control Module) — the program which acts as the nucleus of the integrated system. A macro is simply a file consisting of a collection of key-strokes and interactive commands.

The tutorials are an excellent introduction to the various system components, but are not just a replacement for the material in the appropriate manuals. They give the impression of having been well designed by someone with an understanding of educational principles. The tutorials

The tutorials are excellent introductions to the various system components, but are not just a replacement for the material in the appropriate manuals. They give the impression of having been well designed by someone with an understanding of educational principles.

switch between direct interactive modes, and a 'stand back and watch while I do it for you' approach.

Notice also the MCM option on the top line of the Main Menu. The MCM is the heart of Enable. It contains the system-wide features of windowing, file management, macros and profiles. The MCM can also be reached while using any of the functional system components.

Another common feature is the ability to call up a 'top line menu' from any application by pressing the F10 key. This is generally a 'root' menu from which you can access the various functions of the MCM.

The Word Processor

I freely admit I cannot help but approach any new program with a natural bias for the system which I currently espouse. This applies especially to new word processing packages.

For better or worse, I have adhered faithfully to WordStar for many years — in spite of its admitted drawbacks and deficiencies. As a result, Enable's word processor took some time to impress me as a viable alternative to Old Faithful.

The Word Processing manual is a mere 111 pages, but is comprehensive, well indexed, and includes two reference appendices.

Some people (probably quite justifiably) complain about the complexity of WordStar's keystroke collection. While not having done a comparison count, I find

Enable's equivalent to be even more cryptic. They are totally non WordStar-like (arguably an advantage), and make heavy use of the function keys as prefixes to command groups. For example, to delete the current line in WordStar you hit Ctl Y. In Enable, you press F9, Del, L (in that order). F9 Del B deletes a block. The complexity arises from the number of deleting options. Where WordStar has only five deletion options, Enable has 20! As a result, the manual's appendices or the reference card get heavy usage until the system is learned.

Another problem is the lack of a spelling checker. While preparing this report using Enable, I found its statistical report on the document to be valuable (it gives a word count), but it was necessary to dump the file in WordStar format (a thoughtful option) in order to run SpellStar.

Incidentally, Enable lets you save a file in either its own format, or as straight ASCII, Volkswriter, Easywriter or WordStar. You can also load from files stored in those formats. That's being considerate. File sizes are not limited by RAM capacity, since a virtual file structure is maintained (spilling transparently to and from the disk).

Unlike WordStar, which has a single (global) ruler governing the current text entry margins, Enable permits the insertion of rulers into the text itself as a means of controlling the format of separate sections of text. Naturally these rulers do not print, and they can be manipulated with immediate effect on the subsequent text.

Reformatting of text during entry or editing is automatic (although this feature can be switched off if required). As a result there is no equivalent to WordStar's Ctl B

code. The state of the insertion mode toggle is indicated by the size of the cursor. This perhaps is a better idea than WordStar's specific top line message 'INSERT ON'.

I rather like the philosophy of what-you-see-is-what-you-get. The various print attributes (bold, italics, double strike, superscript, and so on) are represented in different colours. You can select these colours when preparing a profile. You can also type in the various box-drawing symbols, as well as certain special symbols and Greek letters.

Printing a Document

I managed to get a reasonable printout on my oddball dot matrix printer by specifying a 'not listed' option when choosing a printer type for the profile. Unfortunately, this suppresses things like bold print and the other print attributes.

The print function is decidedly more powerful than that of WordStar. One can ask for a statistical summary of the document, have it prepare a cover sheet, and many other neat things. However, I could not find a way to suspend a printout once it had been initiated — apart, that is, from rebooting the system — and that ain't Kosher. Perhaps that feature will be in the next release of Enable (which promises to be a major upgrade).

Perhaps the most interesting and useful aspect of the word processor is its ability to import data from the spreadsheet, database and graphics subsystems without leaving the word processor. I'll be exploring this further in the second part of this article, when I review the Spreadsheet, Database, Graphics and Telecommunications subsystems. □



HIFINANCE 3

Melbourne-based software house Hisoft has had extensive experience in writing both general accounting software and accounting packages for vertical markets. Here Les Bell examines its latest package.

WITH THE advent of microcomputers, full double-entry bookkeeping has become feasible for all but the smallest businesses. Accounting packages have been available for micro and personal computers since 1977, when MITS (remember?) released its Altair Accounting System. To date, over two dozen accounting packages have been released onto the Australian market, of varying capabilities and features.

The latest is HiFinance 3 from Melbourne software house Hisoft. This is a high-performance general-purpose accounting package which will meet the needs of a wide variety of businesses, and has been designed with the capabilities of today's 16-bit personal computers very much in mind.

For example, early eight-bit microcomputers were generally based on a pair of floppy disk drives with limited storage, usually with drive A allocated to programs and drive B containing the data diskette. This had two effects: first, the programs themselves were limited in size by the floppy disk capacity and hence limited in complexity/sophistication; and second, the

disk capacity limited the number and size of data files, so that audit trails, for example, were often omitted.

To compound the problem, early eight-bit processors, coupled with low-performance disk controllers and drives, simply did not have the horsepower to maintain check totals and other security and auditing provisions on the files. The auditability of some (indeed many) early accounting packages therefore could not be assured.

HiFinance 3 does not suffer from these limitations. The programs themselves, for example, occupy 22 IBM PC floppy disks, indicating that they use just under 8 Mbytes of disk space. If you have an IBM XT or similar, that's not really a problem, although it leaves only 2 Mbytes free on an XT for other programs and data. This is not a lot of free space, and I'd suggest HiFinance should be installed on a system with 20 Mbytes of disk space rather than a standard 10 Mbyte XT.

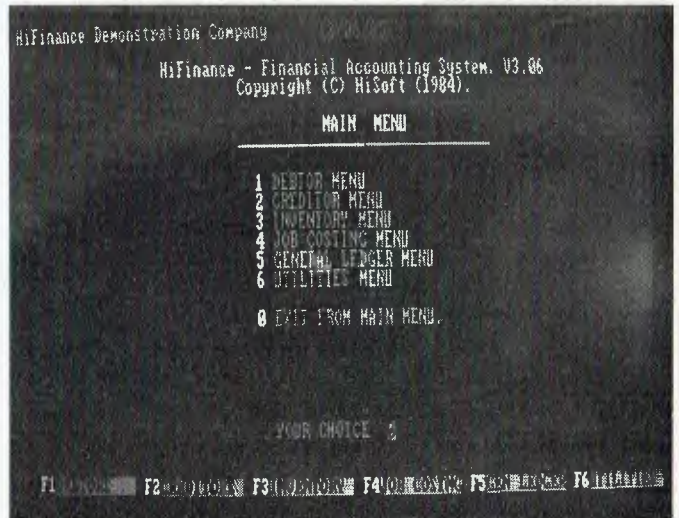
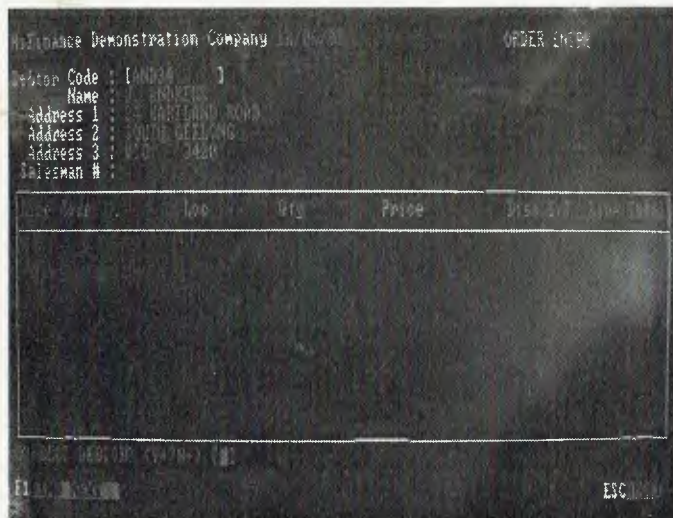
That consideration aside, HiFinance 3 makes good use of its increased breathing space. Firstly, it produces a daily audit trail which should be securely filed in a remote

location for use by auditors. Most micro accounting packages do not provide this facility.

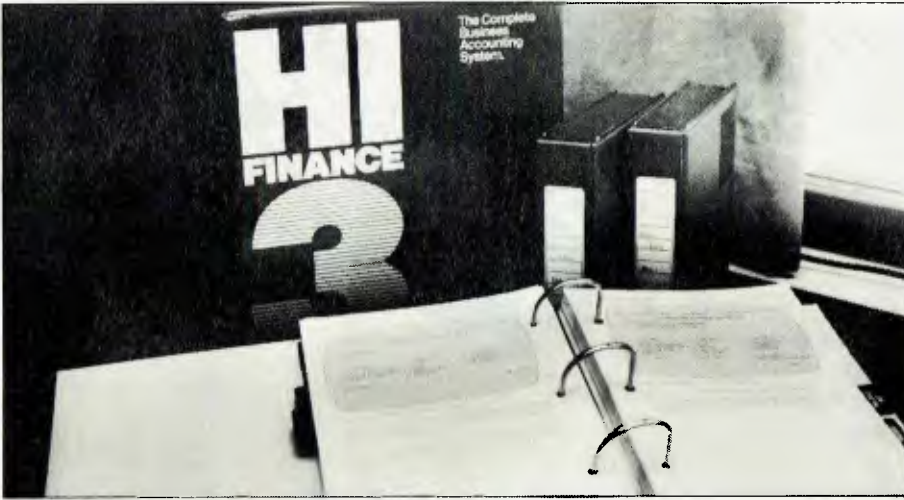
Secondly, HiFinance 3 is (unusually for a micro accounting package) written in COBOL. It should not make any difference to the user which language a package is written in, and in an ideal world that would be the case, but we live in a far from ideal world.

It is more important, in writing an accounting package, that the system designer and programmers should understand business, rather than programming. It is easy to find experienced micro programmers with BASIC skills; what is more difficult is to find experienced business software programmers with BASIC skills. COBOL programmers usually have a fairly good understanding of business accounting procedures and can therefore be relied on to write code that solves the user's problem, rather than terribly elegant code which solves a different problem.

COBOL on micros has long had a bad reputation, mainly because of the poor performance of early compilers and the code they generated. Recent compilers for



HIFINANCE3



the 8088 processor, however, have been considerably improved. HiFinance 3 appears to be written in Microsoft COBOL, which is one of the new breed of micro COBOLs.

HiFinance 3 consists of six major modules and one option:

- General ledger
- Debtors (with invoicing and sales analysis)
- Creditors
- Order processing (including debtors' order entry and purchase orders)
- Inventory management
- Job costing
- Multi-location inventory

Each module can stand alone, but one of the major features of HiFinance 3 is the extent to which the modules integrate, with automatic posting of transactions between them. This saves time and eliminates a major source of data entry errors.

HiFinance 3 was supplied to us as set of 23 disks, which contained a backup of the system off a master demo hard disk. Installation therefore consisted of issuing the standard DOS RESTORE command and feeding floppies into the gaping maw of our PC until it was satisfied. Since the system is designed for the standard IBM PC/XT environment there was no requirement to install screen drivers or configure file sizes.

Most users will have their copy of HiFinance 3 installed by 'one of the top eight accounting firms'. I could make a snide remark that feeding 23 floppies into a drive is about the right level of technical complexity for the big eight accounting firms, but I won't. The same people are responsible for providing the necessary on-site training, which is included in the purchase price.

Not having been trained, we simply looked for a batch file with an appropriate name, and on finding HIFIN3.BAT, ran it. It can't be that easy, surely? Perhaps we missed something?

But no, everything worked right first time and has continued to work correctly ever since. One of these days we might get around to reading the manual.

Good and Bad News ...

Interesting point number one. HiFinance 3 takes a long time to get started. It took 30 seconds of frantic disk activity before the system displayed its first message — *** VALIDATING SYSTEM INTEGRITY *** — and a total of 1 minute 14 seconds before the date entry screen appeared. Vee haf some goot news and ...

The bad news is that this appears to be aggravating time-wasting. It's psychologically bad, since it's not enough time to have a cup of coffee. The good news is that HiFinance 3 is not in fact wasting its time or yours. Most of the time is spent testing various files for corruption and, I hope, nefarious tampering. This is well worth-



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while, although I can't help wondering what the program would do if it found a bad file. It would probably be a case of restoring from the last backup, rather than the program attempting a repair job.

If passwords have been initialised, the program prompts for them at this point. Otherwise it boots straight into the main menu. This looks pretty much like you'd expect, permitting access to the debtors, creditors, inventory, job costing, general ledger and utilities sub-menus, with the addition of six function key labels at the bottom of the screen, which give access to the same menu choices through the function keys.

This program has been written with the IBM (or compatible) environment very much in mind, and tends to make use of the F1-F10 function keys where other packages might use control keys or other techniques. For example, most menus also present function key choices at the bottom of the screen which allow you to move directly to a module's main menu from wherever you currently happen to be.

HiFinance 3's menu structure is very straightforward and pretty much what you might expect if you know about accounting systems. Most are similar in this respect: they do the same things in the same basic ways with only minor differences and refinements. What seems to differentiate HiFinance 3 from the rest is the attention paid to small things, which all add up to a better 'feel' for the package.

For example, menus work in a consistent manner, as do data entry screens. Hitting the zero key always takes you up one level in the menu structure (even at the top level — bearing in mind the slow start, there should be a confirmation request before

What seems to differentiate HiFinance 3 from other accounting packages is the attention paid to small things, which all add up to a better 'feel' for the package.

you are dumped at the C:> prompt), and the ESCape key lets you escape from screens.

Screen layouts are very similar all the way through, giving a comfortable feeling of familiarity to the user. This is important on systems with a type-ahead buffer; there's nothing worse than keying ahead of the system only to discover the customer ID is not the first field on the screen and

you've just caused the system to do something totally weird.

Data entry screens include direct validation against the database; for example, keying in a customer code will cause that customer's name and other details to be automatically displayed.

Neat Features

Rather than bore you with a blow-by-blow description of how double-entry book-keeping works (I'm still not convinced that it does), I'll concentrate on the other specifically neat features of HiFinance 3.

First, the multi-location module. This dovetails seamlessly with the inventory module and provides separate stockholding data for up to 99 locations. This means when orders are entered, you have to specify the location which will supply an item, and likewise specify locations when entering invoices from creditors. The inventory module's reports are expanded to show stock positions and values and provide comparative sales performance statistics. It sounds nice and simple, but internally it's not. If you're not a programmer, you'll

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

```

HiFinance Demonstration Company 13/08/85 INVENTORY ENTRIES
INV. # 100054 1 WARNING-No exact match found for:
DESCRIPTION COLOR TELEVISION SET 540H.
UNIT OF MEASURE EA VALUE ON HAND $11,000.00
INVENTORY GROUP # 1 QTY. ON HAND 10.000
SUPPLIER E1E469 AVERAGE COST $1100.00
TAX RATE 1 QTY. ALLOCATED 1.000
TAX BASIS 0 QTY. B/ORDER 1.000
LAST PURCHASE PRICE $600.00 QTY. P/ORDER 1.000
STND. COST PRICE $0.00
PRICE 1 $699.00 QTY SALES PTD 0.000
PRICE 2 $649.00 VALUE OF SALES PTD $0.00
PRICE 3 $629.00 COST OF SALES PTD $0.00
PRICE 4 $609.00 STND. COST OF SALES PTD $0.00
S/TAX INCL. IN COST (V/M) N QTY. SALES YTD 0.000
S/TAX VALUE INCL. IN COST $0.00 VALUE OF SALES YTD $0.00
RE-ORDER POINT 3.000 COST OF SALES YTD $0.00
MAX. STOCK POINT 10.000 STND. COST OF SALES YTD $0.00
DATE LAST MOVEMENT 7/07/84
Press a Function key to continue
F1:MENU F2:PRINT F3:PRINT F4:PRINT F5:SEARCH ESC:END
    
```

```

* ACCOUNT CUSTOMER FILE ENQUIRY *
1 Account code 0POLLOS
2 Name S. APOLLO
3 Address 1 12 STATION ROAD
4 Address 2 & 3 HYNION
5 Post code 3444
6 Phone(AH)
7 Phone(BN) 623422
8 Contact STIVE
9 Sales Tax No.
10 Cr. Limit 0
11 Category
12 O/D. Change M
13 Ret./Whole P
14 Cust. Disc % 0
15 Blvd. Bal. 0.00
16 Current 0.00
17 30 days 0.00
18 60 days 0.00
19 90 & over 0.00
20 Last Sale 0 / 0
21 Last Paid 0 / 0
22 MTD. Sales 0.00
23 MTD. Cost 0.00
24 YTD. Sales 0.00
25 YTD. Cost 0.00
BALANCE CHD
Customer .....
Enter FULL, or PARTIAL Customer code, or ESC to Terminate
    
```

never have to worry about it.

The debtors module seems pretty flexible, if not to say feature-laden. Some gems I picked out: choice of either open item or balance forward accounts; printing of invoices at time of entry or in batches; automatic sales tax calculation and reporting; will invoice for line items, jobs supplied or services rendered. A unique feature is the ability, for companies which buy goods with sales tax and sell them to exempt customers, is the ability to calculate the sales tax rebatable.

Creditors are open item, allowing transactions to be held until fully matched, which makes disputes easier to manage; cash flow requirements can be forecast, for the near future at least, from reports.

The inventory module uses a fifteen-digit coding structure which should accommodate most existing schemes. It maintains quantity on hand, quantity allocated, quantity on back order, quantity on purchase order and sales value for items in up to 99 warehouses (with the optional multi-location module), reorder point and maximum stock. Up to four selling prices can be maintained.

Perhaps the most powerful feature of the inventory module is the inventory ledger report, which shows full stock movement details for either the period or the year for each inventory item. The sales activity report (essential for retailers) shows margins on a line item by line item basis.

The job costing module allows dissection of jobs into 'source costs', which allows comparison of budget and actual costs on a smaller scale and across jobs. This suits the needs of many businesses, including builders, printers, engineering

Perhaps the most powerful feature of the inventory module is the inventory ledger report, which shows full stock movement details for either the period or the year for each inventory item.

works and software houses.

Tying the whole system together at the base is the general ledger. Again, flexibility is the keynote, with 15-character account codes and up to 13 accounting periods, with a further three available after year-end for completion of the accounts. The general ledger integrates with the other modules so that most entries are posted automatically.

All the modules include a selection of standard reports which would meet most users' requirements without further adaptation. It is possible to report on selection criteria from subsets of the data-

base.

HiFinance 3's file extract utility allows data to be abstracted and passed to spreadsheets and databases for completely flexible management reporting.

Documentation (Well, you might need it ...)

I've just had a look at the manual and it's nicely laid out, but I didn't need it to use the system on a set of dummy accounts. Admittedly, I would need to check through it and have a word with my accountant before setting up a new chart of accounts and setting all the initial balances.

The manual is, in fact, designed with the naive user in mind, even explaining terms like 'jargon' ('Jargon is the term given to the type of technical language that computer experts use to discuss their equipment.') — in a manual full of terms like 'standing journal', 'posting', 'aging' and so on. Naive computer user maybe, but with at least some bookkeeping experience.

Our overall impressions of HiFinance 3 are strongly positive; the system responds pretty quickly for a microcomputer COBOL system and seems to be pretty solid. We gave it a fair pounding and couldn't get it to fall over. Hisoft's earlier products have done well; this one certainly deserves to. □

PRODUCT DETAILS

Program: HiFinance 3
 Made by: HiSoft Pty Ltd
 Useful for: General small business accounting
 Hardware required: IBM PC/XT, or similar
 Options: Order entry module, multi-location module
 Price: \$860 per module
 Review copy from: HiSoft Australia Pty Ltd.
 598 St Kilda Road, Melbourne 3004. (03) 529 2333.

HiFinance Demonstration Company 12/06/85 GENERAL LEDGER ENTRY

ACCOUNT 1100.01

DESCRIPTION SALES - ELECTRICAL
 EXPECTED SIGN C
 WARNING FLAG N H = NORMAL, W = WARNING, I = TOTAL, D = DESCRIPTION
 ACCOUNT TYPE A = ASSET, L = LIABILITY, P = PROP, R = REVENUE, E = EXPENSE

PERIOD	BUDGET	ACCUA. BUDGET	PTD BALANCE	ACCOM. BALANCE
1	\$11,600-	\$11,600-	\$2,897.10-	\$2,897.10-
2	\$11,600-	\$23,200-	\$0.00	\$2,897.10-
3	\$11,600-	\$34,800-	\$0.00	\$2,897.10-
4	\$11,600-	\$46,400-	\$0.00	\$2,897.10-
5	\$11,600-	\$58,000-	\$0.00	\$2,897.10-
6	\$11,600-	\$69,600-	\$0.00	\$2,897.10-
7	\$11,600-	\$81,200-	\$0.00	\$2,897.10-
8	\$11,600-	\$92,800-	\$0.00	\$2,897.10-
9	\$11,600-	\$104,400-	\$0.00	\$2,897.10-
10	\$11,600-	\$116,000-	\$0.00	\$2,897.10-
11	\$11,600-	\$127,600-	\$0.00	\$2,897.10-
12	\$11,600-	\$139,200-	\$0.00	\$2,897.10-

LAST YEAR TOTAL \$95,000.00-
 YEAR BEFORE TOTAL \$83,600.00-

Press a function key to continue
 F1: BACK F2: PRINT F3: INFORMATION ESC: END

12-06-85 * Display Products *

#1. Prod. Code	ATTACHEEXEC	18. On Order	0
2. Description	LEATHER ATTACHE CASE	19. On Hand	0.00
3. Prod. Group	CS	20. Reserved	1.00
4. Department	GI	DAY ** 21. Quantity	0.00
5. Supplier	QBC COV.	22. Value	0.00
6. Supp. Code	L8001	23. Cost	0.00
7. Sell Unit	EA	WEEK ** 24. Quantity	3.00
8. Tax Code	2	25. Value	4378.00
9. Cost Price	1250.0001	26. Cost	3750.00
10. Retail	1499.0001	MONTH * 27. Quantity	5.00
11. Wholesale	1327.0001	28. Value	2196.00
12. Min Stock	2	29. Cost	6150.64
13. Max Stock	5	YEAR ** 30. Quantity	6.00
14. Inv. Reord	1	31. Value	8595.00
15. Stock Req	Y	32. Cost	7350.96
16. Pricing	0		
17. Discount	Y		

Product

Enter FULL, or PARTIAL Product code, 'F3'=see Purchases, or ESC to Terminate

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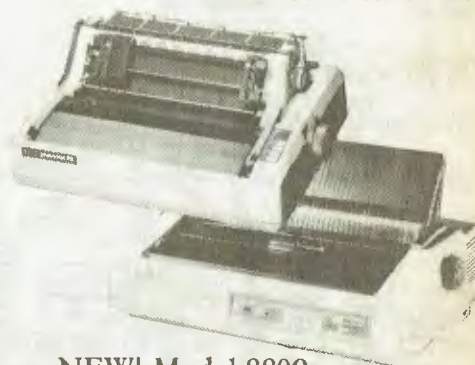
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NEC

APC III

ADVANCED PERSONAL COMPUTER III

T/MAKER first appeared back in 1980, and was being sold as a spreadsheet in opposition to Supercalc for CP/M systems. The fact that it was also a text editor, report generator and lord knows what else was at that time irrelevant; the world wanted Visicalc and the air was full of the sound of keys tapping information into spreadsheets.

Since then, T/Maker (which stands for Table Maker) has been through a couple of revisions and has emerged as a kind of 'do everything' package. There's no doubt it breeds enthusiasts; its versatility and power mean users who may have other packages tend to drop them and convert across to using T/Maker for all their work.

A major advantage of T/Maker is its ability to run on an eight-bit CP/M system. While there are a lot of IBM PCs out there, there are a lot more CP/M systems, whose owners have been looking with longing at packages like Lotus 1-2-3 and Framework.

T/Maker has a different 'feel' from those packages. Because it will run on a variety of CP/M systems with different terminal characteristics it obviously doesn't have the same graphics capabilities as PC packages. Nonetheless, it does provide useful graphics facilities for more modest systems. Likewise, it can't depend heavily on programmable function keys; instead, T/Maker itself is fully programmable.

For example, T/Maker as supplied works with Lear-Siegler-style cursor arrow keys, so the down-arrow control is actually Control J. I have been using T/Maker with a Freedom 200 terminal, which generates Control V for down-arrow. No problem — I simply redefined T/Maker's commands so the Control J and Control V commands were swapped. This is not a problem — in fact it's an advantage, since Control V was previously the column move instruction and placing it on Control J allows the more serendipitous mnemonic of 'juxtapose'.

Of course, if you have programmable function keys on a terminal, they can be put to good use to simplify some command sequences. For example, having the Wordstar control sequences ingrained in my fingertips, I found myself naturally tending to type Control N to insert a line into the text, rather than the T/Maker command, which is Control R. Again, by programming the 'INS LINE' key on the terminal, everything was simplified.

Skilful Editor

I'm actually writing this using the T/Maker

T/Maker's is a pretty comprehensive editor, though the accent (from the word processing point of view) is not strongly on the 'what-you-see-is-what-you-get' style of editing.

word processor or text editor. In fact, using the editor is a key skill in T/Maker, since everything is entered using it. It's a pretty comprehensive editor, though the accent (from the word processing point of view) is not strongly on the 'what-you-see-is-what-you-get' style of editing.

The T/Maker editor handles line entry in three different ways. In the default mode, the user has to enter carriage returns manually. In draft mode, T/Maker has word-wrap facilities similar to Wordstar and other editors, while in Table mode it will continue to extend a line while scrolling sideways.

The default insertion mode is off, which I hate thanks to a tendency to overtyping valuable material accidentally. However, it is easily switchable. More worrying is the operation of the delete key, which deletes the character under the cursor, then backs up one. The operation should be the reverse for easy use, particularly since, with insert set on, backspacing over an error then resuming typing will push an extra character ahead of the cursor. Furthermore, destructive backspacing in a line seems to disable the word-wrap feature for that line, which is even more annoying.

In fact, after typing the paragraphs above, I think I'll work with insert turned off regardless of the risks.

Print formatting is done by the use of 'alignment wedges', which consist of sets of angle brackets placed at the left and right edges of the text. Using these, text can be set to any width and justified or set ragged right. Centring is also possible.

These commands permit quite sophisticated formatting at print time with no real regard to how the edited text appears on the screen while editing. In other words, the text is 'cleaned up' on printing.

Print design commands, which start with a dot (.), allow more sophisticated layout. These commands include page numbering, multi-line headers and footers, widow management and footnoting. Underscoring, boldfacing, overprinting and file inclusion are also supported.

The print command offers the user the option of printing to the screen, pausing between pages or terminating printing.

In normal operation, T/Maker places a command prompt at the bottom of the screen and reads the commands typed there. So far I have used the EDIT, PRINT and ALIGN commands (the latter reformats text as directed by the alignment wedges), but T/Maker has many more commands.

Different Kind of Spreadsheet

Perhaps the most important of the remaining commands — depending on your particular priorities — is COMPUTE. Using the editor, it is possible to create a spreadsheet and then recalculate it. But T/Maker's spreadsheet is rather different from the Visicalc/Lotus convention.

Spreadsheets are entered in a rather free format, without being constrained to particular columns. In fact, the T/Maker spreadsheet doesn't consist of rows and columns in the conventional sense; instead the user enters an 'example line' which specifies the format of the numbers in the columns. Anything not under the digits of an example line is not involved in the calculation.

The first seven positions of each line are reserved for mathematical operators. Each position can contain a 'vertical calculation strip', which specifies the calculation to be performed on each column of figures.

T/Maker's precedence rules are rather strange. In evaluating a strip, mathematical operators are carried out in the following sequence: additions first, then subtractions, then multiplications, and finally divisions. Most of us are used to conventional mathematical precedence — multiplication and division first, then addition and subtraction — but the T/Maker method seems quite appropriate for its calculation strips. It's not wrong; it's just different from the standard agreed by mathematicians, and once you get used to it, it works well.

Horizontal calculation strips are of course possible as well, which means T/Maker can be used for most of the applications currently being handled by conventional spreadsheets, plus many more it is

peculiarly suited for. As well as the standard arithmetic operators, T/Maker also has functions (they're actually called 'terminator symbols') for logarithmic and trigonometric operations, and percentaging and other miscellaneous operations.

Once a spreadsheet has been designed and entered into the workspace using the editor, it can now be calculated using the COMPUTE command. This performs the actual calculation and leaves the results in the right places. This may be all you need, and you can simply print the spreadsheet out — calculation strips, example lines and all. After all, the calculation strips document the model and the calculations involved, and will be useful in interpreting the results.

However, on some occasions you will want to use the spreadsheet as part of a report, in which case you don't want the calculation strips and other material cluttering up the results. The STRIP command will clean up the spreadsheet, removing everything except headings and data, and produce a neat result.

It is possible to use template spreadsheets which can pick up entered data, insert it in the right places and then COMPUTE the appropriate results. In particular, by storing sequences of commands in a T/Maker file and then 'DO'ing them, various budgeting and related management tasks can be automated.

List Processing

T/Maker is very strong on list processing — the organisation of tables of information. A set of commands allows the sorting, selection, summarising and columnar arrangement of tables.

The ARRANGE command allows the user to completely reorganise columns of data by specifying the character positions of the data to be moved into successive columns. This means data can be extracted, leaving other 'fields' behind, so irrelevant detail need not occur in tables.

The DROP and KEEP commands allow lines which do not contain certain strings to be excluded or included in the current workspace, while MATCH compares two files and lists the lines that don't correspond. The SORT command will sort on alphabetic or numeric values in ascending or descending order, and can sort subsections of the list.

Spelling Checker

T/Maker is unusual among the integrated

T/Maker's precedence rules are rather strange — mathematical operators are carried out in the following sequence: additions first, then subtractions, then multiplications, and finally divisions. Conventional mathematical precedence operates otherwise, but T/Maker's method isn't wrong, just different; once you get used to it it works just as well.

packages in having an optional spelling checker. Like the other T/Maker commands, it operates on the document currently in memory.

The PROOF command reads through the document creating a list of unique words, and then compares this list with its dictionary. Misspellings are then inserted at the beginning of the document as two columns of words. The first column is the list of misspellings, while the second is initially identical. By entering edit mode, the user can now edit the second set of words to the correct spellings.

The CORRECT command will apply the correct spellings to the document by searching for the misspellings in the first column and replacing them with the corrections from the second.

The user can use question marks and wildcards in corrections, and the T/Maker SPELL command will search its dictionary for the correct spelling. Matching words are placed on the same line as the misspelling and the user can then edit the correct one into position.

While not as elegant as, say, The Word Plus or Correctstar, T/Maker's spelling checker fits well with the T/Maker style of operation.

Database

A database manager or information management subsystem is also available. As with the other parts of T/Maker, the database is quite unlike other products.

A database is set up by creating a file and then editing it to create a record definition. This is analogous to dBase II's structure definition; in both cases, the definition is stored at the beginning of the database, but in T/Maker the definition is text and might look like Figure 1.

Once the record definition has been entered, you can use the UPDATE command to enter data. This operates rather like dBase's APPEND command, except that it allows editing and browsing through the database as well. All movement commands are the same as for the T/Maker editor or at least work in an analogous manner: <ESCAPE down-arrow>, for example, moves to the next record instead of the next page.

Quitting from UPDATE and EDITING the current contents of memory will reveal that

Figure 1.

```
<record>
Name:      (name          )
Address:   (address      )
Telephone: (telephone    )
<end>
```

Figure 2.

ex	9999	9999	9999	9999
t Values	35	60	15	45

the data has been entered into the textfile after the record definition. This is fair enough; it makes the file easy to edit and browse through. Each line of data entered has its prompt before it, which is wasteful of space, so T/Maker allows you to have separate record and form definitions which will firstly save space and secondly allow more sophisticated screen layouts.

A sort command is provided in the form of the ORDER command; for example, the command:

```
ORDER name
```

will sort the telephone number database into name order.

While T/Maker is not a true relational database, it does have a rough equivalent for the JOIN command in dBase. The COMPLETE command will fill in fields in one database from records in another, based on some key field matching. So, for example, with a customer transaction database in memory, the command:

```
COMPLETE address.dat customer
```

will fill in customer address information from the file address.dat, based on the field 'customer' matching in both files.

Fields in databases can be derived from others. This is done by placing a 'Rules Definition' at the beginning of the database. This might look like this:

```
<rules> value = price * qty <end>
```

Field values are not automatically computed during data entry; instead this is done by the SET command.

T/Maker's SELECT command is akin to the relational PROJECT command, and for dBase II users is probably best described as being like a COPY FOR command. It allows selection of particular fields, and particular records, based upon some selection criteria.

To sum up the T/Maker database: it is

Integrated software packages for the IBM PC can provide sophisticated graphics capability. Providing that kind of graphics on many other machines is more difficult, and for a variety of CP/M machines is a real challenge. It's a challenge T/Maker takes up.

very versatile, makes good use of the other T/Maker commands, and for the user who doesn't specifically want to work using the traditional relational or hierarchical models, it will seem quite natural. Even if you're a DP professional who wants to work using the relational model, T/Maker is quite well suited to this approach, with some adaptation.

Programmability

T/Maker commands can be strung together, either on the same line or on multiple lines and then executed. For example, the command:

```
GET filename EDIT
```

will load the file and then edit it. The DO command starts executing the textfile currently in memory from the cursor position onwards.

Using this facility, it is possible to construct quite sophisticated programs. It is certainly more powerful than the macro facility present in many spreadsheets.

Graphics

Integrated software packages based on the IBM PC can provide sophisticated graphics capability. Providing that kind of graphics on many other machines is more difficult, and providing it on a variety of CP/M machines is a real challenge. Nevertheless, it's a challenge T/Maker takes up.

Because most CP/M machines use external terminals with no graphics facilities and there is no standard for those that do have graphics, T/Maker can only display fairly simple bar charts, which it draws using standard ASCII characters. Nevertheless, for owners of such machines, even simple graphics capabilities are a welcome addition to their machines' repertoire.

Perhaps an example might demonstrate: take a look at the T/Maker spreadsheet in Figure 2.

The command:

```
BAR IT
```

OR

```
BAR 'Values'
```

will produce the bar graph in Figure 3.

In fact, I was able to create that graph and insert it into the text by giving the command:

```
BAR IT INSERT END
```

which inserts the graph at the beginning of the text. I then had to block move the graph into its position in the middle of the text — it would have been nice to have it inserted at the cursor position or even the end of the file rather than at the beginning, but that's only a minor quibble.

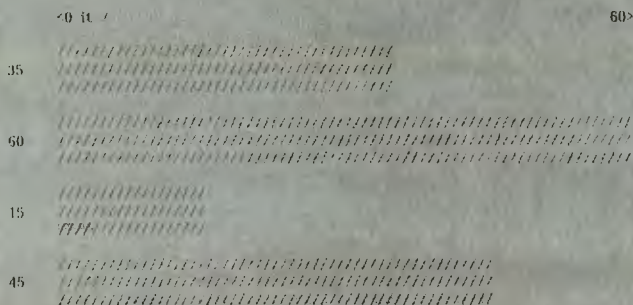
A variety of options is available for the BAR command, controlling the width of the bars, their spacing, their length, the bar character and other parameters. Bar charts can be interspersed or stacked for more sophisticated presentations.

Documentation

The T/Maker manuals are well organised and quite comprehensive. A quick-reference booklet, which shows all the editor keycodes and other commands, can be left open beside the main manual, eliminating the time-consuming page-flicking other manuals often require.

The main manual is organised into sections for each major application and is well

Figure 3.



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T/MAKER

laid-out. It is primarily tutorial in nature, but is not too bad for reference purposes, and in particular contains plenty of realistic examples. The database manager, which is an optional extra, occupies its own section of the manual and is accompanied by tutorial files on the disk.

For those who want to explore T/Maker further, the T/Maker Company produces a user group newsletter which contains detailed examples, hints, complete applications and general background information.

Summary

T/Maker is an interesting product for a number of reasons. First, it is the only product for CP/M machines to offer anything approaching this integration of word processing, database, graphics, spreadsheet and spelling checker. There are many owners of Osborne, Kaypro, Morrow, Bondwell and similar machines who could put a program like this to good use.

Secondly, T/Maker has a distinctive 'flavour' or 'character' which most other programs do not have. This is difficult to define, but I can start by calling to your attention the fact that all the T/Maker modules operate quite differently from their equivalents on the IBM PC and other machines. This is, in part, because earlier versions of T/Maker predate these other programs, and also because T/Maker seems to be very much the product of one man, who has con-

tinued to extend it in various ingenious ways.

There's more to this 'flavour' than just that, however. One gets the feeling T/Maker is a tremendously open-ended product, for which the user will continue to find new applications and new ways of doing things.

We had very little difficulty with T/Maker, apart from one or two bugs and some unexplained behaviour. For example, sometimes backspacing or typing a long line near the end of a line while in draft/insert mode would apparently cancel the word-wrapping function and cause the cursor to move to the end of the line and stay there. The spelling checker also displayed some reticence about correcting multiple misspellings of a word.

We liked T/Maker. Initially, it can be a bit of a problem remembering all the editor's control codes, but by redefining them appropriately within T/Maker itself and programming the extended function keys of a good terminal like our Freedom 200's, it is possible to make T/Maker's editor as user-friendly as any on the market.

Remembering the commands can also be a problem, but the optional menus, which prompt the user continuously, get around that nicely. For anyone looking for integrated software useful to a small business, T/Maker should be seriously considered. □

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

PRODUCT DETAILS

Program: T/Maker
 Made by: T/Maker Company
 Useful for: Word processing, data processing, file management
 Hardware required: CP/M, CP/M-86 or PC-DOS systems
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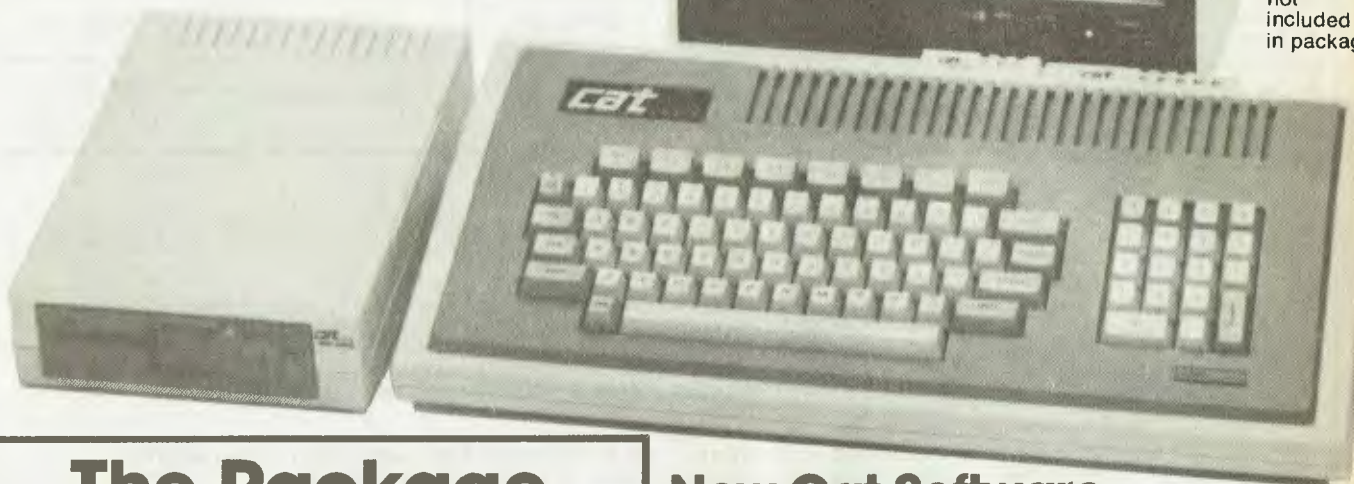
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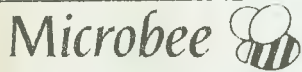
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COMPUTERSTOP



POCKET PROGRAMS



SIMPLE ACCOUNTING

Simple Accounting is a program I've developed over the past two years which adds and subtracts and has a built-in calculator. Although it doesn't have all the bells and whistles of commercially available software, it is efficient in its limited applications.

An interesting feature is the screen display, which mixes both high-res and inverse graphics. The Microbee Manual says this can't be done, but it is possible using a minimum of PCA graphics with the PLOT command and then using the PCG command to print inverse characters on the screen.

The program is most suitable for the home environment but can be used in small businesses that have up to one hundred accounts to deal with. It uses cassette storage and can print on either serial or parallel printers.

Names of records are kept in data statements, which allows convenient editing with the AUTO 100 command, the auto-edit feature of the Microbee. The last data statement must always be in the form DATA "", so the program knows how many records there are. Data statements must begin at line 100 and increment by 10, so that the RESTORE command can be used to locate each record's name.

When run, the program asks for the date, which must be entered in the format dd/mm/yy.

After the date is entered the main menu appears. Choices one and two deal with displaying several records or one record; choices three and four save and load the numeric data from cassette; choice five displays the grand totals; six returns to BASIC; and seven clears the screen until a key is pressed.

When working on a particular record screen (see screen dump) a list of options is displayed. Pressing A lets you add numeric data to the record, pressing RE-

1 Electricity			
Debit Amount	- Credit Amount	- Payment	+ Old Balance
123.45	43.00	45.55	4545.00
1234.78	34.00	45.00	
984.56	567.89	429.61	
23000.00	123.55	185.25	
230000.00	123.78	53.46	
3434.40	345.89	545.54	
798.37	123.56	554.45	
109.45	55.56	454.45	
903.45	3434.43		
12.37			NEW BALANCE
260600.83	4851.67	2313.31	257980.85

* OPTIONS : A , E , M , F , W , D , C , < , > *

```

00001 REM THIS LINE IS NECESSARY for the program to operate dont delete
00003 GOT0808
00004 GOT0782
00006 PRINTIF10.2A3J" ":RETURN
00007 PRINTCA63 321;:RETURN
00008 PRINTCA11 321:RETURN
00009 PRINTG2$;:RETURN
00010 FRINTP2$;M2$;:RETURN
00012 CURS0:PRINTX;TAB(0)D0$;:RETURN
00014 GOSUB72
00016 CURS62,16:GOSUB24:G=SEARCH(A4$,A0$)
00018 ONGGOT0502,4,88,92,94,598,798,724,770
00020 GOSUB9:GOTO16
00022 REM * ALPHA keys in upper case *
00024 A0$=KEY:IFA0$="" THEN24ELSELETD=ASC(A0$):IFD>64:D=(DAND95)
00026 A0$=CHR(D):IFD>12ANDD<92THENRETURNELSE24
00028 REM * clear line 16 *
00030 CURS0:PRINT:CURS960:GOSUB7:CURS960:RETURN
00032 REM * numeric input #####.### *
00034 A3=0:U=1:CURSZ,Y+2:PRINTCHR(190);:E6$=""
00036 GOSUB24:E6$=E6$+A0$:IFLEN(E6$)>F THEN42
00038 IFD=13ELSEIFD<46ORD>57THEN42ELSEPRINTA0$;:GOTO36
00041 A3=VAL(E6$):IFA3<999999THENCURSZ,Y+2:PRINT" ";:RETURN
00042 CURSZ,Y+2:PRINT"ERROR";G2$;:PLAY0,5:CURSZ,Y+2:GOSUB8:GOTO34
00046 REM * plot screen *
00048 POKE128,8:PLOT 5,223T05,23:PLOT 128,23T0128,223
00050 PLOT 256,223T0256,23:PLOT 384,23T0384,223
00052 PLOT 504,223T0504,23T05,23:PLOT 5,55T0504,55
00054 PCG:CURS65:PRINTN1$:CURS753:PRINTN3$;:RETURN
00056 REM * file display*
00058 CURS0:GOSUB7:GOSUB68:W=1
00060 FORY=3T012:CURS4,Y:GOSUB8:CURS20,Y:GOSUB8:CURS36,Y:GOSUB8
00061 NEXTY:CURS52,3:GOSUB8
00062 CURS0:PRINT:K=1:IFW THENHIRES:GOSUB48:NORMAL:GOSUB72
00064 GOSUB12:GOSUB518:GOTO16
00068 G=(X+9)*F:READ(G)D0$:O=(60-LEN(D0$))/2:RETURN
00070 REM * option display *
00072 GOSUB28:PRINT,"* OPTIONS : A , E , M , F , W , D , C , < , > * ";
00074 CURS0:PRINT:RETURN
00076 REM * get file number *
    
```

Microbee

TURN moves to the next column; E allows data to be edited or deleted; M returns you to the main menu; F opens another file; W erases a file; D dumps the screen to a printer — serial or parallel — with the date displayed on the printout for future reference; C enters the calculator mode.

The calculator is the top line of the screen, and uses left to right evaluation. Percentages are entered in the format I20%. The REM statement in line 1 must not be removed, as it is used by the calculator. Pressing E<CR> exits the calculator mode.

The program will run on a Microbee with 16 Kbytes, but for more than 20 files it requires a 32 Kbyte machine. The one thing I would like to see added to the program is a simple word processor capable of handling up to 60 lines of text; notes could then be printed above and below record printouts.

N.B. A copy of Simple Accounting can be downloaded from *Your Computer's* bulletin board.

Graham Upshall
Goulburn NSW

```

00078 CURS960:PRINT,"Do you know FILE NUMBER Y or N ?";
00080 GOSUB24:IFD=89ELSEIFD=78THENRETURNELSEGOSUB9:GOTO78
00082 GOSUB30:W=-1:CURS971:PCG
00084 PRINT"Which File Number ( 1 - ";J; " ) ? ";:NORMAL
00086 Z=44:Y=14:GOSUB34:X=INT(A3):IFX>0ANDX<=JTHENRETURNELSEGOSUB9:GOTO86
00088 GOSUB82:REM GET FILE NOS
00090 GOSUB72:X=X+1
00092 X=X-2:IFX:X=J-1:REM < dir
00100 DATA"Electricity"
00110 DATA"Rates"
00120 DATA"Gas "
00130 DATA"Food"
00140 DATA"Hire Purchase"
00150 DATA"Bank Loan"
00160 DATA"Health Fund"
00170 DATA"Charge Account #1"
00180 DATA"Charge Account #2"
00190 DATA"Bankcard"
00200 DATA"Petrol "
00210 DATA"Solicitor"
00220 DATA"Telecom"
00230 DATA"Savings Account #1"
00240 DATA"Savings Account #2"
00250 DATA" "
00260 DATA" "
00270 DATA" "
00280 DATA" "
00290 DATA" "
00300 DATA" "
00310 DATA" "
00320 DATA" "
00330 DATA" "
00340 DATA" "
00350 DATA" "
00360 DATA" "
00370 DATA" "
00380 DATA" "
00390 DATA" "
00400 DATA" "
00410 DATA" "
00420 DATA" "
00430 DATA" "
00440 DATA" "
00450 DATA" "
00460 DATA" "
00470 DATA" "
00480 DATA" "
00490 DATA" "
00500 REM renum rest of program to fit in more data
00502 IFA1(X,F)>0ANDB1(X,F)>0ANDC1(X,F)>0ANDD1(X)>0THEN20
00504 L=-1:GOSUB50B:L=0:GOTO14
00506 REM* ADD TO ACCOUNT *
00508 PCG:GOSUB2B
00510 PRINT,,"P2#;"RETURN TO MOVE TO NEXT COLUMN";[A11 32];
00512 NORMAL:IFA1(X,F)>0:K=2
00514 IFB1(X,F)>0ANDK>1:K=3
00516 REM * DISPLAY / ADD DATA *
00518 FORC=KTO3:FORY=1TOF:S=0
00520 ONCGOSUB[4,A1(X,Y)] 538,[20,B1(X,Y)] 538,[36,C1(X,Y)]538
00522 IFA3=0THENNEXT*Y 532ELSEIFSTHEN530
00524 IFC=1:A1(X,Y)=A3:A1(X,0)=A3+A1(X,0)
00526 IFC=2:B1(X,Y)=A3:B1(X,0)=A3+B1(X,0)
00528 IFC=3:C1(X,Y)=A3:C1(X,0)=A3+C1(X,0)
00530 NEXTY
00532 ONCGOSUB582,588,594:NEXTC:K=1
00534 Y=1:GOSUB[51,D1(X)]538:D1(X)=A3:CURSZ,14
00536 E0(X)=A1(X,0)+D1(X)-B1(X,0)-C1(X,0):A3=E0(X):GOTO6

```

Microbee 

```

00538 VAR(Z,A3): IFA3>0: S=-1 ELSE IFL THEN GOSUB 34
00540 IFA3=0 THEN RETURN ELSE CURSZ, Y+2: GOT06
00542 REM * EDIT B *
00544 Z=Z-F: CURSZ, Y+2: GOSUB 8: GOSUB 34: ONC GOT0546, 550, 554
00546 A1(X,0)=A1(X,0)-A1(X,Y)+A3: A1(X,Y)=A3: IFA3=0 THEN 558
00548 CURS4, Y+2: GOSUB 6: GOT0582
00550 B1(X,0)=B1(X,0)-B1(X,Y)+A3: B1(X,Y)=A3: IFA3=0 THEN 558
00552 CURS20, Y+2: GOSUB 6: GOT0588
00554 C1(X,0)=C1(X,0)-C1(X,Y)+A3: C1(X,Y)=A3: IFA3=0 THEN 558
00556 CURS36, Y+2: GOSUB 6: GOT0594
00558 IF Y=F: ONC GOT0582, 588, 594 ELSE FOR V=Y TO 9: ONC GOT0560, 566, 572
00560 A3=A1(X, V+1): IFA3=0 THEN NEXT*V 578
00562 A1(X, V)=A3: A1(X, V+1)=0: CURS4, V+3: GOSUB 8
00564 CURS4, V+2: GOSUB 6: NEXT V: GOT0580
00566 A3=B1(X, V+1): IFA3=0 THEN NEXT*V 584
00568 B1(X, V)=A3: B1(X, V+1)=0: CURS20, V+3: GOSUB 8
00570 CURS20, V+2: GOSUB 6: NEXT V: GOT0586
00572 A3=C1(X, V+1): IFA3=0 THEN NEXT*V 590
00574 C1(X, V)=A3: C1(X, V+1)=0: CURS36, V+3: GOSUB 8
00576 CURS36, V+2: GOSUB 6: NEXT V: GOT0592
00578 CURS4, V+2: GOSUB 8
00580 Y=Y-1
00582 CURS4, 14: A3=A1(X, 0): GOT06
00584 CURS20, V+2: GOSUB 8
    
```

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POCKET PROGRAMS

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```

00586 Y=Y-1
00588 CURS20,14:A3=B1(X,0):GOTO6
00590 CURS36,V+2:GOSUB8
00592 Y=Y-1
00594 CURS36,14:A3=C1(X,0):GOTO6
00596 REM * EDIT A *
00598 IFA1(X,1)+B1(X,1)+C1(X,1)+D1(X)=0THEN20ELSEGOSUB28:FCG
00600 PRINT "***P2$Y to CHANGE AN AMOUNT, "P2$R3$***";:NORMAL
00602 FORC=1TO3:FOR Y=1TOF
00604 ONCGOSUB(14,A1(X,Y)1616,[30,B1(X,Y)1616,[46,C1(X,Y)1616
00606 NEXTY:NEXTC:CURS188:PRINTCHR(141);:GOSUB610
00608 CURS881:GOSUB536:GOTO14
00610 Z=51:Y=1:GOSUB24
00612 IFD=89THENCURS178:GOSUB8:GOSUB34:D1(X)=A7:CURS178:GOTO6
00614 IFD=13THENCURS188:PRINT" ":RETURNELSEGOSUB9:GOTO610
00616 VAR(Z,A3):IFA3=0THENRETURN
00618 CURSZ,Y+2:PRINTCHR(141);:GOSUB24:IFD=89THENS44
00620 IFD>13THENGOSUB9:GOTO610ELSECURSZ,Y+2:PRINT" ":RETURN
00622 REM * VIEW FILE *
00624 GOSUB78:IFD=78ELSE636
00626 REM * FILE TITLES *
00628 CLS:A=12:RESTORE:FORX=1TOJ
00630 READD0$:IFA=12THENPRINT" FILE NAME OF ACCOUNT"
00632 PRINT[15X1,D0$:IFA=12THEN638ELSELETA=A-1:NEXTX:GOTO644
    
```

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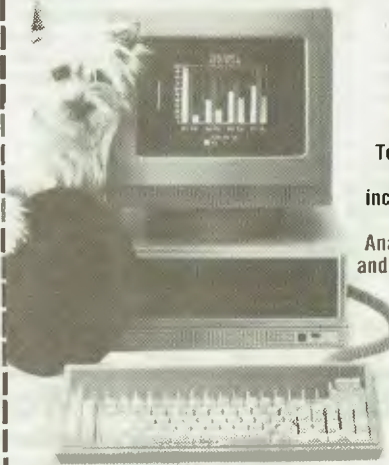
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POCKET PROGRAMS

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```

00634 GOSUB82
00636 GOSUB68:GOTO62
00638 A=12:CURS4,16:INVERSE:GOSUB10:PRINTR3$,"F2$;:NORMAL
00640 GOSUB24:IFD=70THENNEXT*X 634ELSEIFD=77THENNEXT*X 4
00642 IFD=13THENCLS:NEXTXELSEGOSUB9:GOTO640
00644 CURS4,16:PCG:GOSUB10:PRINTF2$;," V to View Again ":
00646 NORMAL:GOSUB24:IFD=77THEN4ELSEIFD=70THEN634
00648 IFD=86THEN62ELSEGOSUB9:GOTO646
00650 REM * TOTAL UP ALL FILES *
00652 PRINT TAB(24)T2$;" 's"
00654 A1(0,0)=0:B1(0,0)=0:C1(0,0)=0:D1(0)=0:E0(0)=0:IN#60N
00656 FORX=1TOJ:E0(0)=E0(0)+E0(X):D1(0)=D1(0)+D1(X)
00658 A1(0,0)=A1(0,0)+A1(X,0):B1(0,0)=B1(0,0)+B1(X,0)
00660 C1(0,0)=C1(0,0)+C1(X,0):NEXTX
00662 CURS7,7:PRINTT2$"DEBITS";[F10.2A1(0,0)]
00664 CURS1,4:PRINTT2$"OLD BALANCES";[F10.2D1(0)]
00666 CURS1,5:PRINT[A29 61]:CURS1,7:PRINT[A29 61]
00668 CURS8,6:PRINTT2$"OWING";[F10.2A1(0,0)+D1(0)]
00670 CURS34,8:PRINTT2$"CREDITS ";[F10.2B1(0,0)]
00672 CURS34,9:PRINTT2$"PAYMENTS";[F10.2C1(0,0)]
00674 CURS33,10:PRINT[A27 61]:CURS33,12:PRINT[A27 61]
00676 CURS34,11:PRINTT2$"PAID OUT";[F10.2C1(0,0)+B1(0,0)]
00678 CURS23,14:PRINT"NEW BALANCE ";
00680 PRINT[F10.2D1(0)+A1(0,0)-C1(0,0)-B1(0,0)]
00682 GOSUB10
00684 GOSUB24:IFD=77THEN4ELSEGOSUB9:GOTO684
00686 REM * SAVE DATA *
00688 CURS5,6:PRINT"INSERT CASSETTE , "P2$"PLAY & RECORD"
00690 CURS8,8:PRINTF2$"R to save New Balances to TAPE"
00692 CURSF,F:PRINT"or "":GOSUB10
00694 GOSUB24:IFD=82ELSEIFD=77THEN4ELSEGOSUB9:GOTO694
00696 CURSF,11:INVERSE:PRINT"PLEASE WAIT "
00698 D5#=D7#(1,2)+D7#(4,5)+D7#(7,8):PRINT"saving data ";D5#
00700 NORMAL:OUT#3:PRINT[A63 42]:PRINT[A63 42]:PRINTD5#
00702 FORI=1TOJ:PRINT0(X):NEXTI:GOTO720
00704 REM * LOAD DATA *
00706 CURS5,6:PRINT"INSERT DATA CASSETTE , "P2$;"PLAY"
00708 CURS8,8:PRINTF2$;"L TO LOAD or "\,,:GOSUB10
00710 GOSUB24:IFD=77THEN4ELSEIFD=76ELSEGOSUB9:GOTO710
00712 CURSF,12:PRINT"PLEASE WAIT "":IN#3:OUT#0OFF
00714 INPUTA0$:IFLEN(A0#)<>6THEN714
00716 OUT#0:PRINT"Loading ";A0#:IN#3:OUT#0OFF
00718 FORI=1TOJ:INPUTD1(I):NEXTI:IN#0
00720 OUT#0:CURSF,9:INVERSE:PRINT"ALL DONE":NORMAL:GOTO682
00722 REM * PRINTER ROUTINE
00724 GOSUB28:PCG:PRINT" "P2$;" P - Parallel , S - Serial , RETURN for Options",
00726 GOSUB24:NORMAL:IFD=80:L=1ELSEIFD=83:L=5ELSE14
00728 OUTL#LON:LPRINT\X,D0#,D7#\,N1#:FORY=1TOF
00730 IFA1(X,Y)=0THENLPRINT,[A17 32]:ELSELPRINT,[F10.2A1(X,Y)]:[A7 32]:
00732 IFB1(X,Y)=0THENLPRINT[A15 32]:ELSELPRINT[F10.2B1(X,Y)]:[A5 32]:
00734 IFC1(X,Y)=0THENLPRINT[A14 32]:ELSELPRINT[F10.2C1(X,Y)]:[A5 32]:
00736 IFY=1ANDD1(X)<>0THENLPRINT[F10.2D1(X)]:ELSELPRINT

```

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POCKET PROGRAMS

Microbee 

```
00738 IFA1(X,Y)+B1(X,Y)+C1(X,Y)=0THENNEXT*Y 742
00740 NEXTY
00742 LPRINT,[A63 611]\,[F10.2A1(X,0)];[A7 721];[F10.2B1(X,0)];
00744 LPRINT[A5 321];[F10.2C1(X,0)];[A5 321];[F10.2E0(X)]
00746 LPRINT,[A63 611]\:OUTL#10FF:GOTO14
00748 REM * CALCULATOR
00750 E6$="":CURS0:GOSUB7:CURS0:PRINT">";:ONERRORGOTO768
00752 GOSUB24:E6$=E6$+A0$:IFD<>13THENPRINTA0$;:GOTO752
00754 R=LEN(E6$):CURSR+2:PRINT"=";:Z=2309:IFR>30THEN768
00756 FORA=1TOR-1:B=ASC(E6$(;A)):IFB>57THENNEXT * A 774
00758 IFB=37ELSEPOKEZ,B:GOTO762
00760 POKEZ,47:Z=Z+1:POKEZ,49:Z=Z+1:POKEZ,48:Z=Z+1:POKEZ,48
00762 Z=Z+1:NEXTA
00764 POKE2308,131:POKEZ,58:POKEZ+1,149:POKEZ+2,58:POKEZ+3,161
00766 GOSUB1:CURS0:GOSUB24:IFD=69THEN774ELSE750
00768 CURS0:PRINTG2$error:UNKNOWN FUNCTION";G2$;:PLAY0,F:GOTO748
00770 CURS960:GOSUB7:PRINTR1$;"CALCULATOR MODE ";:PCG
00772 PRINT": + : - : * : / : % : E to Exit.";:NORMAL:GOTO750
00774 POKE2308,161:CURS0:GOSUB7:CURS0:PRINT:GOSUB12:GOTO14
00776 REM * Stand by
00778 GOSUB24:GOTO4
00780 REM * Menu *
00782 CLS:CURS143:PRINT"M E N U"
00784 PRINT,"1 - View all File Titles"
00786 PRINT,"2 - View a File",,"3 - Save Data"
00788 PRINT,"4 - Load Data",,"5 - Totals"
00790 PRINT,"6 - Exit",,"7 - Stand by"
00792 PCG:PRINT,"W H I C H ( 1 - 8 ) ";:NORMAL:GOSUB24:D=D-48
00794 PRINT:CLS:ONDGOTO628,624,688,706,652,836,776:GOSUB9:GOTO4
00796 REM * CLEAR ARRAYS *
00798 GOSUB28:PCG
00800 PRINT,P2$"K to Clear this FILE ",R3$;:NORMAL
00802 GOSUB24:IFD<>75THEN14ELSEFORV=0TOF
00804 A1(X,V)=0:B1(X,V)=0:C1(X,V)=0:NEXTV:D1(X)=0:GOTO90
00806 REM * SET UP
00808 POKE220,20:F=10:STRS(400):POKE140,1:M2$=" M for Menu,"
00810 N1$=" Debit Amount - Credit Amount - Payment + Old Balance "
00812 N3$=" NEW BALANCE ":HIRES:GOSUB48:G2$=CHR(7):R1$=CHR(13)
00814 F2$="PRESS ":R3$=" RETURN to continue":T2$="TOTAL "
00816 A4$="AMF,.EWDC":F2$=" F for File ":POKE128,8
00818 CURS460:PRINT" S I M P L E A C C O U N T I N G ":NORMAL
00820 J=J+1:READD0$:IFD0$=" ":J=J-1ELSE820
00822 DIMA1(J,F),B1(J,F),C1(J,F),D1(J),E0(J):POKE220,100
00824 REM date/ EXIT
00826 CURS980:INPUT"Enter Date (dd/mm/yy) ";D7$;
00828 IFLEN(D7$)=8:D6$="SIMPLE ACCOUNTING "+D7$ELSECURS980:PRINT[A42 321];:GOTO8
26
00830 FORY=27TO64:POKEY+62464,32:NEXTY
00832 FORY=1TO27:POKEY+62463,ASC(D6$(;Y,Y)):NEXTY
00834 IN#60N:OUT12,6:OUT13,17:GOTO4
00836 CURS960:GOSUB10:PRINT" RETURN TO EXIT";:GOSUB24
00838 IFD<>13THEN4ELSECLS:POKE220,111:IN#60FF:POKE140,0: END
```


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NUMBER SLIDE

Number slide is a computer version of the puzzles that used to be given away with breakfast cereal. This version has been adapted from a ZX81 program printed in this magazine a few years ago.

The idea is to rearrange the numbers in correct order after the computer has mixed them up. The program should work on other computers without much modification.

Bruce Daniel
Mudgee NSW

```
10 DIMA(9):BS%=CHR$(B)+CHR$(B)+CHR$(127)+CHR$(127)
12 Z$=""
15 CLS
20 FORX=1TO9
30 LETA(X)=0
```

```
40 NEXTX
50 LETA(5)=-32
60 FORX=1TO9
70 IFX=5THENGOTO130
80 LETP=RND(B)
90 FORY=1TO9
100 IFA(Y)=PTHENGOTO80
110 NEXTY
120 LETA(X)=P
130 NEXTX
140 PRINT@224,Z$;Z$;:PRINT@0,;
200 FORX=1TO3
210 FORY=1TO3
220 PRINTCHR$(A(Y+(X-1)*3)+64);" ";
240 NEXTY
250 IFX=1THENPRINT* 123"
260 IFX=2THENPRINT* 456"
270 IFX=3THENPRINT* 789"
280 PRINT
290 NEXTX
300 PRINT
310 PRINT@256,"MOVE FROM: ";BS%;
```

```
320 INPUT
340 IFF>9THENGOTO310
350 PRINT
360 PRINT@320,"MOVE TO: ";BS%;
370 INPUT
380 PRINT:IF(F=3ANDT=4)OR(F=4ANDT=3)ORT=0THEN310
390 IFT>9OR(F=6ANDT=7)OR(F=7ANDT=6)THENGOTO360
400 IFNOTA(T)=-32THENGOTO360
410 IFABS(F-T)=1ORABS(F-T)=3THENGOTO430
420 GOTO310
430 LETA(T)=A(F)
440 LETA(F)=-32
450 CLS
470 FORI7=1TO7
480 IFA(I7)>A(I7+1)THENGOTO200
490 NEXTI7
500 PRINT"CONGRATULATIONS, "
510 PRINTTAB(5)"YOU HAVE SOLVED THE PUZZLE."
520 PRINT
530 INPUT"TRY AGAIN (Y/N) ";X$
540 IFX$<"N"THENRUN
550 CLS:END
```

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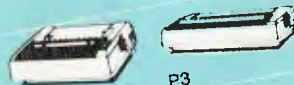
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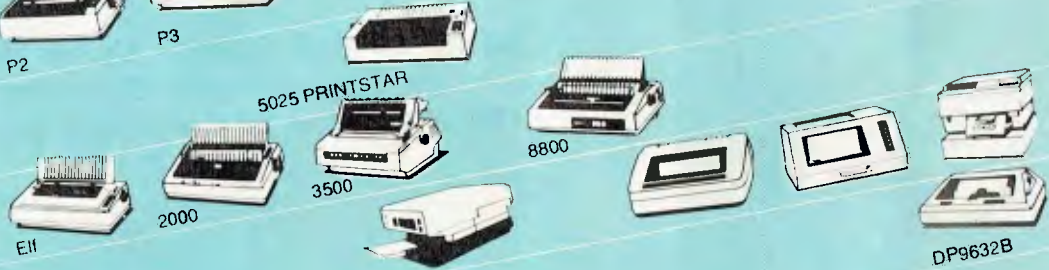


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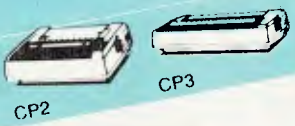
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HOW TO WRITE A STRUCTURED PROGRAM - Part Five

LAST MONTH we dealt with the problem of translating a program represented by a set of flowblocks into actual code. Two methods were illustrated: one was manual, the other used the flowblock translator supplied with the Speedit system. The language in both cases was BASIC.

In this article, we will start the development of a program designed to convert a file of captured keystrokes into a formatted file suitable for dBase II applications. We will describe the design steps taken when using Speedit's editor, and illustrate some additional control constructs.

The Problem Definition

This is a real-life problem which presented itself earlier this year. A colleague had become involved with direct mail advertising, and wanted to prepare a file suitable for use with a database system. He preferred to use a simple word processor to capture the original data.

The source material was a printout purchased from an agency, containing names and addresses of potential customers. The list was in street order within suburbs since it had been derived originally from local councils. As a result, street and suburb names changed infrequently. The following scheme was therefore devised for capturing the data in the most efficient manner.

Firstly, the operator would key in the new street and suburb. A single full stop would precede the street name, and two full stops would precede a new suburb. Each entry would be on a single line. Subsequent names and street numbers (until the next street name change) would be keyed as a title code (in the range 0 through 8), followed by the initials, a single space, the surname, then the street number. The following is a sample (fictitious) keystroke file segment:

```
.SMITH AVE
.CHATSWOOD 2067
4IH JONES3
4K RICHARDS5
```

Phil Grouse, author of textbooks on computer programming (and a member of our Computer of the Year Award Committee) continues his series on Structured Programming.

```
2MF HOWELL7
1SWJ GREEN9
4L LOWE11
3P KNOWLES10
2H SNAITH8
1IJ JAMES6
4WG BROWN4
GRAHAME CRES
4KK LANE3
4J BLACK5
1MS TREATT4
4A MOON2
```

Notice that this portion of the file represents the residents of two streets - Smith Avenue and Grahame Crescent, both in Chatswood. The first character is the title code, and these are as follows:

Code	Title
0	Non-residential address
1	Mr
2	Mrs
3	M/S
4	Mr and Mrs
5	Dr
6	Rev
7	Mr and M/s
8	Dr and Mrs

This means the fourth line of the file

corresponds to the label:

```
MR & MRS K RICHARDS
5 SMITH AVE
CHATSWOOD 2067
```

For each name and address, the program is to generate a record with the following fixed-length format:

Field Contents	Field Length
Title	8
Initials	7
Surname	25
Number	7
Street	20
Suburb	15
Postcode	4
Filler	1

All entries are to be flush left to the margin within their respective fields, and the filler field is to contain a single blank (to be used later by another program). Just how these records are to be converted into labels is not our problem.

Mainlining Again

Our mainline will be as simple as that of the previous example. It is shown in Figure 1, and invokes the modules **Init** and **Process**. **Init** initialises a few variables, and will open the input and output files as **#1** and **#2** respectively. **Process** will read a single-keystroke file record, and write a corresponding database record. After it has processed the last record, the built-in EOF function will return a TRUE value (to signify file **#1** has reached the end). The mainline therefore processes each record in the input file, then closes both files.

Before starting work on the remaining modules, let's see how the Speedit editor

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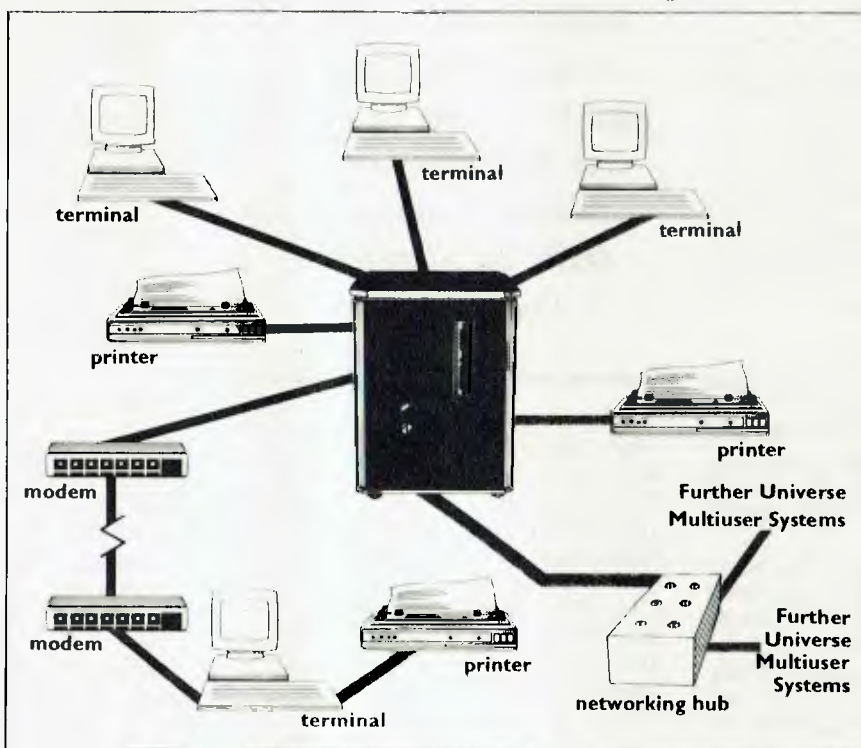
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block editor could be used to generate the mainline module.

We'll use the name MAILER for the program (.SPT) file. I assume the Speedit components are on the current disk drive, including the editor (SP.EXE) and the translator (XLATE.EXE). There is also a help file and a printer definition file, but we can ignore these for the time being. We start the exercise by entering the DOS command:

```
>sp mailer
```

After skipping Speedit's initial help screen (because we're just so expert), we are asked for the name of the program. Now this might seem a little odd, since it would be natural to use the same name as the program file. But Speedit is asking for a name for the mainline module, and this can be up to 16 characters in length. We could have used Mailer, but I've chosen the longer, more descriptive name of Converter.

The editor then asks for a short description of the module. This time we reply, 'Convert keystroke file into fixed-length records.' On pressing the Return key, the editor displays an empty flowblock named Converter. The short description just entered is displayed in the bottom row as a reminder of the module's function. The cursor is waiting patiently in the inside top left corner of the flowblock, and we're now ready to enter text. As you will see, this is done using conventional (Wordstar) means and some special keys.

Refer again to Figure 1; this is how we expect the mainline module to appear after we've entered its text. The first two lines are GOSUBs. While it's quite legitimate to type these two lines as they appear, it's preferable to use the F8 key to create the GOSUB. The reason is that the F8 function

*After skipping Speedit's
initial help screen
(because we're just so
expert), we are asked for
the name of the program.
Now this might seem a
little odd, since it would be
natural to use the same
name as the program file.*

also creates a new named (empty) flowblock further down the track corresponding to the called subroutine.

Here's how it should be done. When the F8 key is pressed, the word GOSUB appears in the flowblock, and the question 'Name of block/pile?' appears at the bottom of the screen. We reply 'Init' then press Return. Another question appears: 'Block comment?'. This time we give a short description of Init's role: 'Open files and initialise title table', and so on. On pressing Return again, the 'GOSUB' is followed by 'Init'.

But something else has happened in the background. We have 'spawned' a new (empty) module named Init. Although not shown on this screen, it has been added to the program. We can display the names (and short descriptions) of all the flowblocks in a program by pressing Alt D (the Display command). If we did that now we would see there are two flowblocks so far: Converter and Init. We can also look at the empty Init module by pressing Alt N (the

Next module command), but it won't be very instructive. Let's return to the text entry.

The second GOSUB is entered in the same manner after pressing Return to position the cursor at the start of the next line. The flowblock will be automatically redrawn to make space for the new line. This time we specify a module name of Process, and the block comment 'Read, convert, and write one record'.

The value of these short descriptions becomes apparent when you begin to enter the text for one of these 'spawned' modules. The short comment reminds you of the module's overall function.

F2 WHILE
F3 FOR
F4 IF-THEN
F5 IF-THEN-ELSE
F6 CASE
F7 Reserved
F8 GOSUB

Table 1. Speedit's function keys which generate control constructs.

WHILE You Wait ...

The next item to enter is the WHILE block. All control constructs are created using the function keys; Table 1 summarises these operations. In this case, we use the F2 key to insert a skeletal WHILE block. First, we put the cursor at the start of the next (empty) line, then press F2; the result is shown in Figure 2. The cursor is positioned just after the WHILE keyword, and there is an empty WHILE-body below it.

We next type in the text to follow the WHILE — just as it appears in Figure 1. When the cursor 'bumps' into the right margin of the flowblock, the editor redraws the diagram with wider margins as soon as

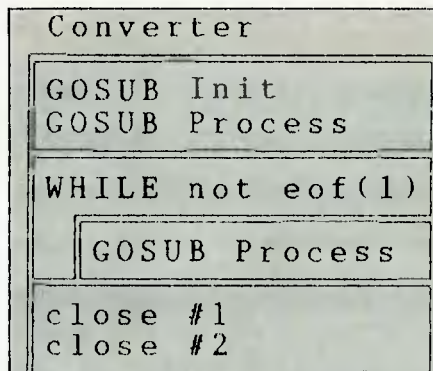


Figure 1. The mainline program for the data conversion program.

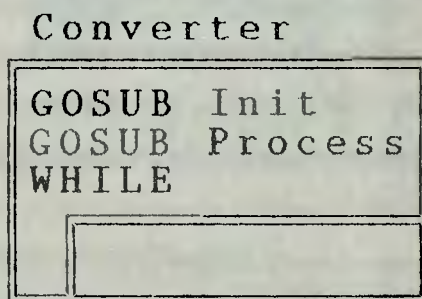


Figure 2. An early stage in the development of the program mainline. The cursor is positioned just after the keyword WHILE.

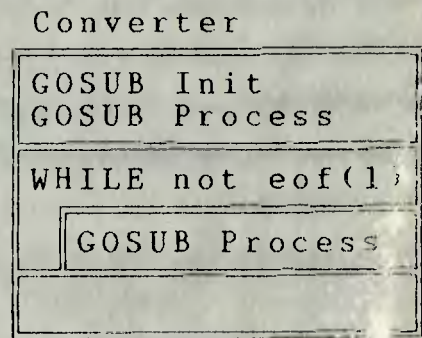


Figure 3. The mainline flowblock follows completion of the WHILE block.

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When the cursor bumps into the right margin of the flowblock, the editor redraws the diagram with wider margins as soon as there is a momentary pause in typing.

there is a momentary pause in typing.

After typing the 'not eof(1)' we do *not* hit Return. That would cause the editor to create a new empty block below the WHILE construct — and it's too early for that. Instead, hit the End key. This puts the cursor in the body of the block. Now we can create the 'GOSUB Process' using the F8 key as before — but this time the system realises there is already a module named Process, so it doesn't request a block comment.

Now we hit the End key again, which takes us out of the body of the WHILE loop and into a newly created block following the WHILE, as shown in Figure 3. Next we simply type the two final lines, as shown in Figure 1. The mainline is now finished.

And so too (almost) is this article. Naturally, we have to save our work so far, and exit from the editor. The command is Alt O (for Out). You'll be asked if you want to save the workspace, so press 'y' (for yes). (*Gee, thanks, Phil, we'd never have guessed — Ed.*) The partial program will be saved in the file MAILER.SPI, so when we resume work on it next time with `>sp mailer` it will be loaded and ready for more text entry from where we left off. □

Speedit was reviewed by Les Bell in our June 1985 issue. Phil Grouse created Speedit as a structured program editor, and markets it through Microshare Systems Pty Ltd. He had previously developed the flowblock methodology whilst working at the University of New South Wales. His excuse for giving himself such blatant free advertising is that there's nothing else available to do the job. We have to agree — we looked, and there wasn't. Nice job, Phil, but don't walk down dark alleys alone at night. □

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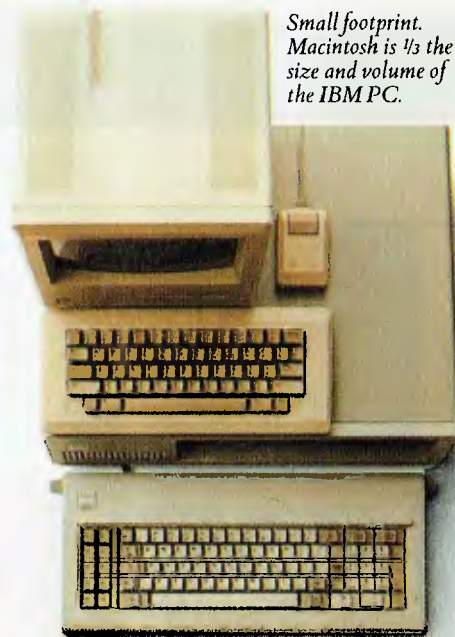


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a Macintosh to the problem. (Macintosh actually weighs less than 9 kilos.

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Of course, the real genius of Macintosh isn't its serial ports or its polyphonic sound generator.

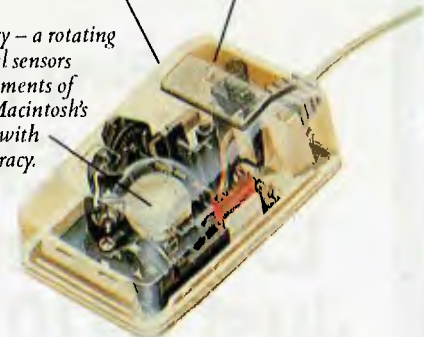
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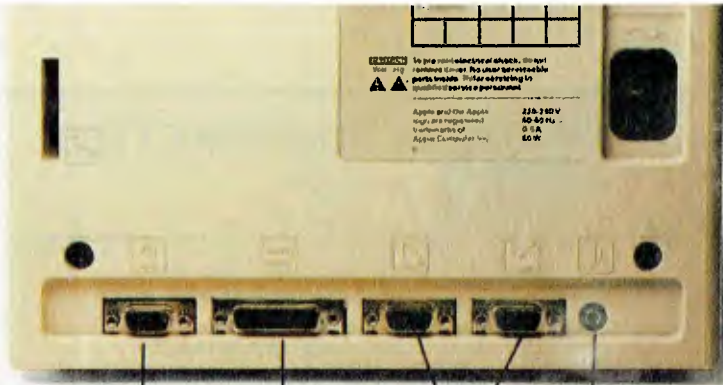
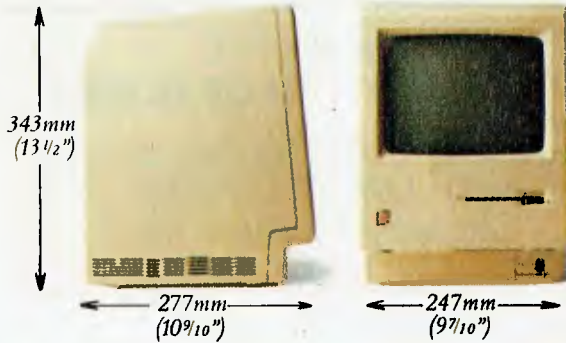
The inside story - a rotating ball and optical sensors translate movements of the mouse to Macintosh's screen pointer with pin-point accuracy.



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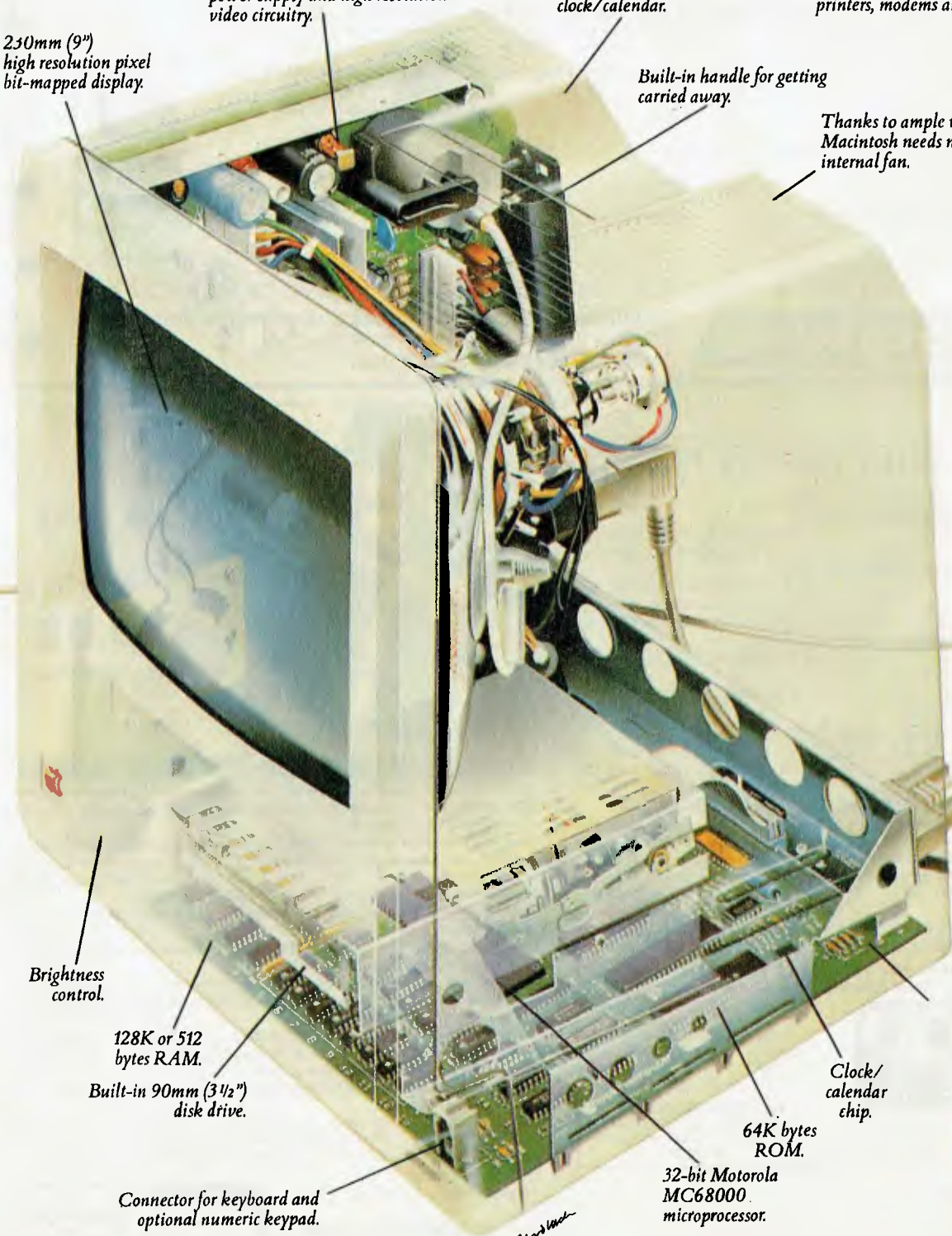
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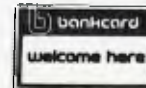
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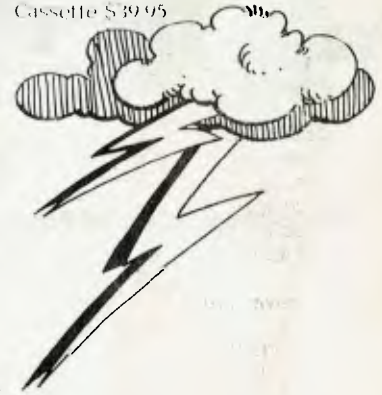
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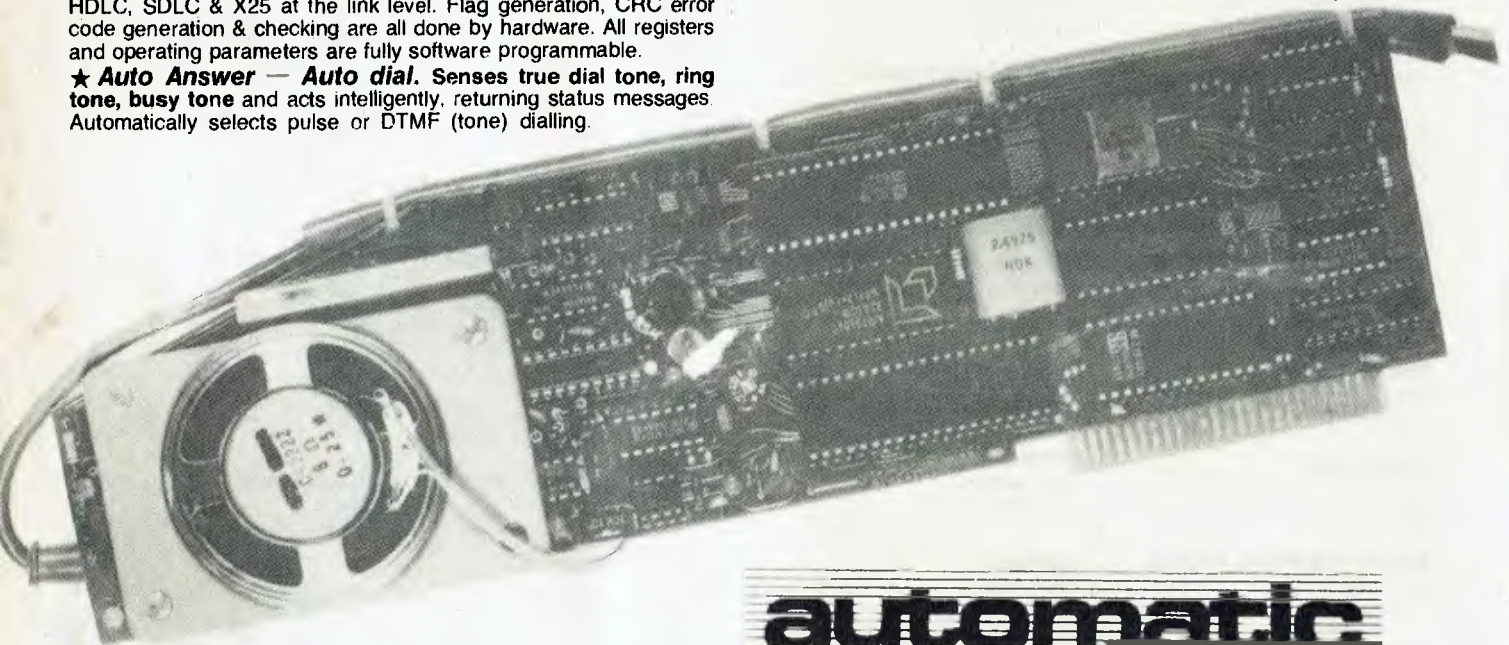
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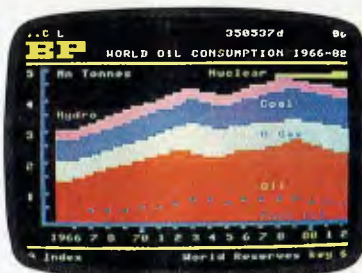
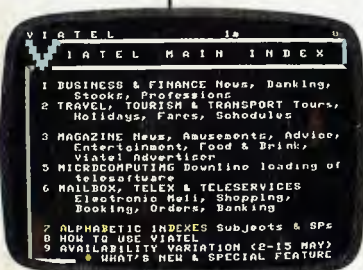
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<i>Where we tell you what we have planned, but don't necessarily expect you to hold us to it . . .</i>	

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Machine Language Interfaces

Programming in a high-level language (HLL) offers a number of advantages over programming in the assembler for your target processor: it increases programmer efficiency and usually offers portability to other types of processor. The disadvantages are larger program size and slower speed. At some time in almost every programmer's life there comes a time when he or she needs to do something with the processor or operating system that is not supported in the HLL interface to its machine environment, or that runs too slowly when written in the high-level language.

Most HLL compilers for PCs offer a 'machine language interface' capability of some sort. Often this is not well documented, and the expectation seems to be that the user who wants to play with all the hocus-pocus of low-level programming in assembler will be smart enough to figure out what needs to be done from very sketchy information. This isn't an entirely invalid position for an HLL compiler author to take, as inexperienced users can create a tremendous support load when they try to use the machine language interface capabilities.

The trouble is that experienced and capable programmers who could usefully use the machine language interface capabilities of a language are often discouraged from doing so when they see the small amount of information usually offered in the HLL documentation. Bad experiences in the past when trying to use other poorly documented features of HLLs (the cultural cringe of programmers, if you like) don't give them much enthusiasm to try again.

The expectation seems to be that the user who wants to play with all the hocus-pocus of low-level programming in assembler will be smart enough to figure out what needs to be done from very sketchy information.

Machine Language Interface

Your Computer staffers use the CBASIC Compiler extensively on a variety of Concurrent DOS computers. The CBASIC manual is a little better than many in that it does have a complete section entitled 'The Machine-Level Environment', which gives a good description of the internal data representation used by the CBASIC Compiler, run-time memory organisation and memory allocation. There is even a section on 'Parameter Passing and Return Values':

"CBASIC Compiler passes all parameters on the hardware stack. When a program calls a routine, CBASIC places each parameter on the stack reading from left to right. The last entry on the stack is the return address.

"An assembly language routine can return integer, real or string values to a CBASIC program. Before returning to the CBA-

SIC program, all parameters passed on the stack must be removed and the stack pointer adjusted accordingly.

"Integers return in register AX. Real numbers return using a pointer in register AX that points to an eight-byte area containing the real value to return. The AX register contains the address of the first exponent byte of the number being returned.

"Strings return using a pointer in register AX. Strings must have been allocated using CBASIC Compiler dynamic storage management routines. The allocation bit of the returning string should be set to 1. This ensures that the space can be reclaimed when no longer needed.

"Any assembly language routine must preserve register ES. All calls to CP/M-86 BDOS destroy the contents of ES. If you use the STD instruction in your assembly language routine, you must clear the direction flag upon exit from the routine. The direction flag is initially clear upon entry to a routine."

What Does it all Mean?

Even a good assembler programmer will probably have to read all that a couple of times to get the hang of it ... and as I said, CBASIC Compiler is one of the better examples of documentation on machine language interfaces.

Listing 1 shows a piece of machine code which allows a general-purpose interface to the CP/M-86 or Concurrent DOS programming interface (BDOS) from the CBASIC compiler. Listing 2 shows a piece of CBASIC code which demonstrates the use of the machine language interface to BDOS from the CBASIC side.

The Assembler Code

The 8086 assembler code is straightforward. To make the module called BDOS visible to other modules in the Digital Research link format it must be declared 'public'. The frame pointer used by CBASIC must be preserved, as we want to use the BP register for our own purposes, so it's just pushed onto the machine stack. The current stack pointer is then copied into the BP register, overwriting the existing contents of BP (which doesn't matter as we just saved them on the stack). The CBASIC

```

Listing 1 starts here)
title "BDOS - a CB86 BDOS Function Caller"
by H.M. Van Tassel, 120 Hill Hollow Road, Watchung, NJ 07090
date 25-Feb-1985

This routine allows CB86 programs to pass a BDOS function
call to the operating system and get the AX return code
passed back to the CB86 program.

To generate a new CB86.LIB which contains the BDOS function call:
RASM86 /BDOS /SZPZ
LIB86 /CB86.LIB /CB86.LIB /BDOS

NOTE: ALL CB86 programs using the BDOS call MUST contain following
DEF BDOS(x, dx) EXTERNAL
INTEGER bdos, dx
FEND

CB86 Syntax
ret code% = BDOS(x, dx, dx, val%)

****
NAME "BDOS"

BDOS
public BDOS
push bp
mov bp, sp
push es
mov cx, 0
mov dx, 0
mov dx, 4
int 2E

Save old frame pointer
set up new frame pointer
must preserve ES
get CX parameter
and the DX parameter
make the BDOS call
    
```

```

mov bx, ax
pop es
pop bp
ret 4

;put AX return code into BX
;must restore ES
;restore frame pointer
;adjust stack and return

and
[Listing 1 ends here]

[Listing 2 starts here]
REM "Test the new BDOS function call by printing a message"
DEF BDOS(x, dx) EXTERNAL
INTEGER bdos, dx
FEND

msg$ = "This message printed by BDOS function call 9"
CHR$(13)-CHR$(10) + "%".

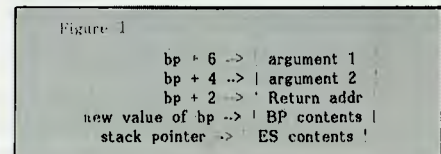
dx, val% = SADD(msg$, 2) REM point beyond string length bytes
fcodex% = 9 REM BDOS function 9 prints string which
REM is pointed to by the DX register

CALL BDOS(x, dx, dx, val%)
PRINT

REM now test the BDOS function call by returning a character
PRINT "Press any Alphanumeric key"

ret code% = BDOS(9, 0) REM C RAWIO wants for character
PRINT "AX return code = " ret code% " NOTE: this is ASCII for
CHR$(ret code%)

END
[Listing 2 ends here]
    
```



documentation warned us to preserve the contents of the ES register, so that is pushed onto the stack too. At this stage the stack looks like Figure 1.

The two arguments for the BDOS call we want to make are now extracted from the stack and placed in the appropriate registers, and the call is then made to BDOS. The return value from the BDOS call is copied to the BX register too. The ES register which we were commanded to preserve is restored, as is CBASIC's frame pointer, and control is returned to CBASIC with the stack pointer also restored to where it was on entry to the assembler routine.

The CBASIC Code

The first thing in the CBASIC example program is the essential definition of the BDOS function call as an external call, with the parameters types defined.

A CBASIC string is then constructed by concatenation. Note the last character added to the string is an ASCII 'S' character, which is the CP/M 'end of string' delimiter for BDOS call 9. The 'SADD' instruction in CBASIC (returns the address of a specified string) is then used to find the memory location (in the data segment) of the string, and a value of two is added to that address value to point past the string length information (at the start of the string) to the actual string text. This value goes into the variable dx.val%, which will eventually end up in the DX register in the assembler routine. The function code for the BDOS 'display string' function is copied into the fcode% variable, which will end up in the CX register in the assembler routine. The call to the BDOS is then made through the CBASIC 'CALL' statement with the dxval% and fcode% variables passed out as parameters.

A prompt string is displayed using the CBASIC 'PRINT' statement (notice how much simpler it was than using the BDOS interface to do the same thing, by the way).

Another use of the BDOS function is made to get a character from the console. Notice that this time no 'CALL' is used and the parameters are CBASIC constants rather than variables. In this use of the BDOS function it returns a value which goes into the ret.code% variable. The constant 6 is the BDOS function code for direct console I/O, and the constant OFDH is the DX register value which tells function 6 to fetch a character. Finally the returned value is displayed in a couple of different forms using the CBASIC 'PRINT' state-

ment.

So there are two ways to use the BDOS function call from CBASIC: the passed parameters can be either constants or variables. In practice you probably wouldn't use the BDOS interface to either print strings or get characters from the console — you'd probably use it for much more sophisticated things, but those functions make a manageable example.

Other HLLs

The example is specific to CBASIC, but the general technique is applicable to any HLL. Each HLL will have its own way of passing parameters and internal data representation, and each operating system will also have its own method of passing parameters and so on. There are numerous examples in the SIG/M public domain software collection of HLL assembly language interfaces for CP/M, Concurrent DOS and PC-DOS, so if you get stuck with your particular language, you may find the answer on your local RCPM or IBBS system. The listings in this column are available from most RCPM systems in the file CB8DOS.A86.

Now that wasn't so painful, was it!

Concurrent PC-DOS 4.1

As I was writing this I learnt Digital Research has released Concurrent PC-DOS Version 4.1 in the US. It will have been readily available in Australia for several weeks by the time you read this. I have been using a beta test release of Concurrent PC-DOS on my IBM PC XT for several weeks, and have found it runs many, many more PC-DOS programs than did Concurrent PC-DOS 3.2. Actually, what I've been using is a mixture of Concurrent PC-DOS 3.2 utilities and Concurrent PC-DOS 4.1 system files, so I won't comment more on it until I've had a chance to use the new Concurrent PC-DOS 4.1.

All registered users of Concurrent PC-DOS 3.2 should have received a mailing from Digital Research by now telling them how to update to the latest release.

PC-DOS 3

IBM has finally announced the release of PC-DOS 3 and the PC AT in Australia. Before you make a commitment to PC-DOS 3, I suggest you carefully test all your existing software with it to make sure it still works. PC-DOS 3 does offer some real advantages, but there are some costs too in terms of existing software. □

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PAMS NEWS

BY BILL BOLTON

Stuck in the Middle?

Alice Springs has its first RCPM system on-line; Mark Little has settled in Alice Springs and has re-established the former Brisbane Experimental RCPM as the 'Red Centre' RCPM system. The system is on-line 24 hours a day and Mark tells me that, not surprisingly, 87 per cent of calls are STD. The experimental nature of the system in terms of encouraging software experimentation and development is still strongly evident.

Sydney's West

Meanwhile in Sydney's Western Suburbs the ABCOM-IBBS is on-line serving users in the 047 area code. I only just found out about this system and haven't had a chance to log into it yet. It's on-line 24 hours a day.

The Deep North

The first PAMS system in North Queensland is the Cairns and District IBBS. Neil Barker has the system on-line outside business hours (and I think during Queensland school holidays) on a Sperry PC. The system serves as a focus for, among other things, the Cairns and District Microbee Users' Group.

Adelaide

There are four new systems on the list this month for Adelaide. I haven't had a chance to log into any of them as their numbers were only uploaded to the Software Tools RCPM a few days ago.

That means there are now 52 systems on the AUSTPAMS list!

TURBOBBS

Rick Dalley, sysop of the BEX II RCPM in Brisbane, is developing a BBS system using Turbo Pascal. TURBOBBS is currently on-line as the message system on the BEX II RCPM, and is being developed in place by Rick. It is fast and has a number of interesting features, with new ones being added all the time. I'm at present working on adapting Rick's TURBOBBS to Concurrent DOS for the next incarnation of the Software Tools RCPM software.

Midas and Compuserve

Since OTC installed its new Midas data gateway, Compuserve users who use the Midas direct-dial in PAD have had a lot of problems. Apparently the Compuserve host computers in the US try to change some parameters on the initiating PAD, in our case a Midas or Austpac PAD.

Austpac PADs seem to accept the change requests and ignore them, so users accessing Compuserve through Austpac have had no problems, but the new OTC Midas gateway doesn't accept the change requests, and this seems to confuse Compuserve. Compuserve lets you get as far as entering your ID number but then won't recognise that you've entered it.

After I'd reported the problem to OTC on several occasions they finally came up with two temporary profiles to overcome the prob-

lem, Profile 10 for V.21 300 bps access and Profile 12 for V.22 1200 bps access. I since found that these profiles only overcome the problem when using the RCA/Gateway to access Compuserve via Midas.

To access Compuserve via Midas through the RCA/Gateway you should:

- When you see the Midas '*' prompt enter PROF 10 (or PROF 12) and a carriage return.
- At the next '*' prompt enter your Midas NUI and then enter 03113 as the address part of the Midas log-in; for example, NABCI23-03113
- The RCA/Gateway will then prompt you for a destination, to which you should enter 'Compuserve'. This will double-echo slowly as you type it, so it's best not to look at the screen while you do it.
- Compuserve will then prompt you for log-in as normal, except that your password will be echoed (so be careful no one sees it; if you have a capture buffer open on your communications program it will go into it, so make sure you delete the password from your capture file later).

PAMS Numbers

Australia

Queensland (EST)

Software Tools RCPM (ST-RCPM) (07) 378 9530 24 hours
BEX II RCPM (BEX-RCPM) (07) 395 1809 24 hours
Tomorrowland DIRECT (BRIS-TLD) (07) 286 2438 24 hours
COMPETRON IBBS (COMPT-IBBS) (07) 52 9294 24 hours
Hi-Tech C BBS (HTC-BBS) (07) 38 6872 24 hours
Texas Instruments (TI-BBS) (07) 263 6161 2100-0600 weekdays only
Brisbane Microbee RCPM (BMUG-RCPM) (07) 38 4833 24 hours
ACEA Commodore BBS (ACEA-BBS) (07) 341 0285 24 hours
Commodore Users BBS (BCUG-BBS) (07) 808 2125 24 hours
Cairns and District IBBS (CAD-IBBS) (07) 51 3582 1800-0800 + 24 hours weekends
Color Computer Link (COCO-LINK) (075) 32 6340 24 hours

New South Wales (EST)

Mi-Computer Club BBS (MiCC-BBS) (02) 662 1686 24 hours
Sydney Public Access RCPM (SPA-RCPM) (02) 808 3536 24 hours
Ausborne UG RCPM (AUSBD-RCPM) (02) 95 5377 24 hours
Tesseract RCPM (TES-RCPM) (02) 651-1404 24 hours
Omen RTRS (OM-RTRS) (02) 498 2495 1630-0900 + 24 hours weekends
Sydney TRS-80 UG RTRS (STRUG-RTRS) (02) 332 2494 24 hours
Prophet BBS (PROPHET-BBS) (02) 628 7030 24 hours
Dick Smith Electronics (DSE-BBS) (02) 887 2276 24 hours
Tomorrowland DIRECT (SYD-TLD) (02) 411 2053 24 hours
Sydney Apple UG (AUG-BBS) (02) 451 6575 24 hours
Texas Instruments UG (TEXPAC-BBS) (02) 560-0926 1900-0600 + 24 hours weekends
Oracle RTRS (ORACLE-RTRS) (02) 960 3641 0-1800 weekdays, 0-0800 weekends

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Sydney Commodore 64 BBS (SYDC64-BBS) (02) 664 2334 24 hours
AUGUR BBS (AUGUR-BBS) (02) 661 4739 24 hours
ABCOM-IBBS (ABCOM-IBBS) (047) 36 4165 24 hours
Newcastle Micro RCPM (NMC-RCPM) (049) 68 5385 1700-0830 +
24 hours weekends

ACT (EST)

Canberra IBBS (ACT-IBBS) (062) 58-1406 24 hours

Victoria (EST)

Melbourne CBBS (MICOM-CBBS) (03) 762 5088 24 hours
TARDIS RCPM (TARDIS-RCPM) (03) 67 7760 1800-0800 + 24 hours
weekends

Sorcerer CUA RCPM (SCUA-RCPM) (03) 434 3529 24 hours
East Ringwood RCPM (ERING-RCPM) (03) 870 4623 1600-2400
daily

PC Connection IBBS (PCC-IBBS) (03) 528 3750 24 hours
HiSoft IBBS (HISOFT-IBBS) (03) 799 2001 24 hours
Computers Galore IBBS (CG-IBBS) (03) 561 8479 24 hours
OMEN IV RTRS (OM4-RTRS) (03) 846 4034 24 hours
MicroPro Computers RCPM (MICROP-RCPM)(03) 568 8180 24
hours

AM-NET RCPM (AMNET-RCPM) (03) 366 7055 24 hours
Microbee User Group RCPM (MMUG-RCPM) (03) 873 5734 24 hours
Gippsland MAIL BUS (GL-MBUS) (051) 27 7245 24 hours

Tasmania (EST)

Mike Scott's BBS (MS-BBS) (003) 34 9411 24 hours

South Australia (CST)

Adelaide Micro UG BBS (AMUG-BBS) (08) 271 2043 1000-2200
Computer Ventures BBS (CV-BBS) (08) 255 9146 24 hours
Electronic Oracle IBBS (EO-IBBS) (08) 260 6686 24 hours
OMEN V RTRS (OM5-RTRS) (08) 45 4666 1800-0700
NEXUS Ed. Dept BBS (NEXUS-BBS) (08) 243 2477 24 hours
Multiple BBS (MULTI-BBS) (08) 255 5116 24 hours
SA Commodore BBS (SAC64-BBS) (08) 382 4631 24 hours

Northern Territory (CST)

Outback RCPM (OUTB-RCPM) (089) 27 7111 24 hours
OMEN II RTRS (OM2-RTRS) (089) 27 4454 24 hours
Red Centre RCPM (REDC-RCPM) (089) 52 8852 24 hours

Western Australia (WST)

OMEN III RTRS (OM3-RTRS) (09) 279 8555 0800-2400 + 24 hours
weekends

New Zealand (NZT)

Attache RBBS (ATT-RBBS) ISD: 64 9 78 9084; Domestic: (09) 76
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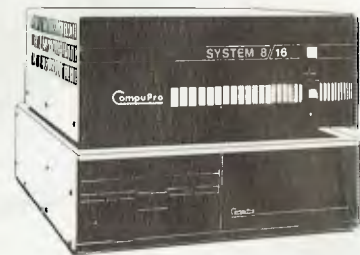
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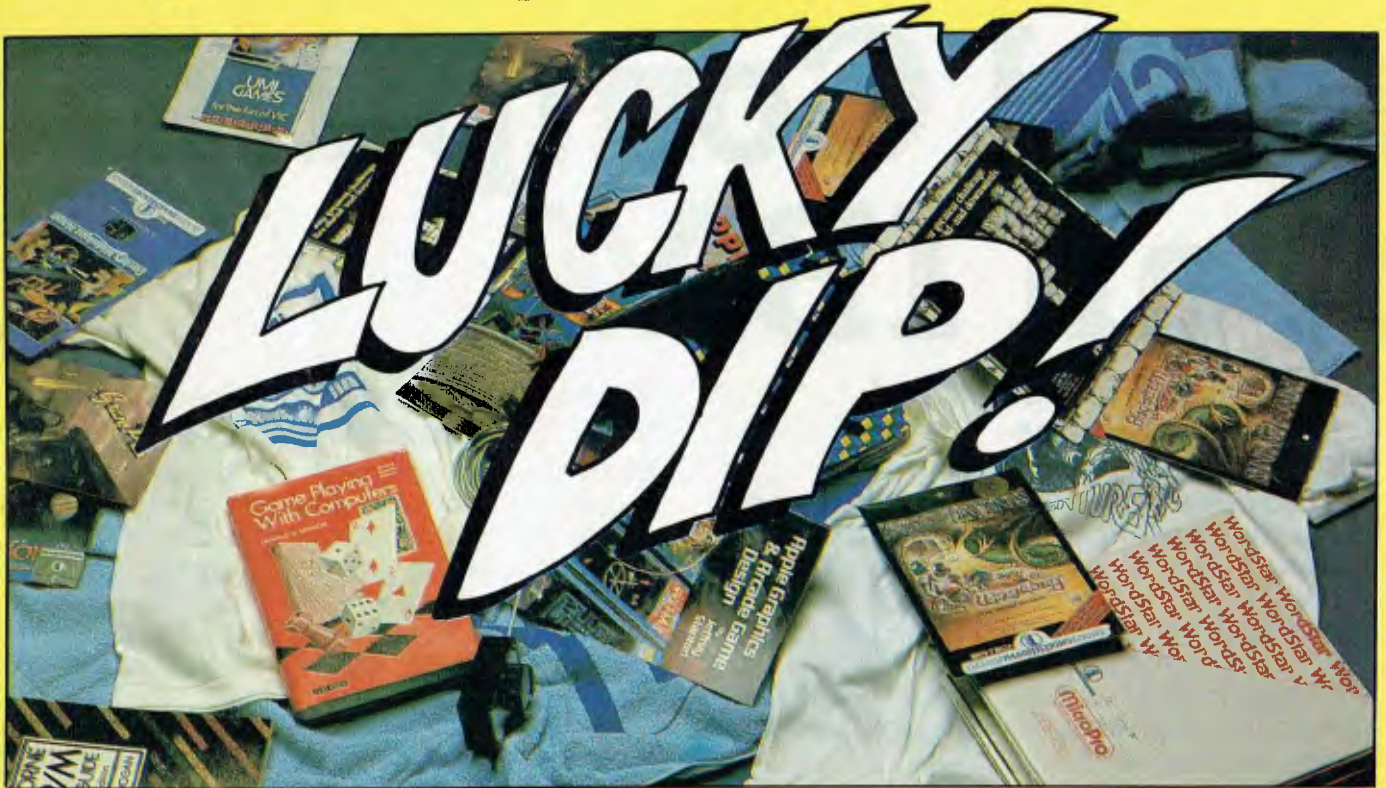
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APCON 85 will feature presentations by users, group panel discussions and workshop sessions. Bill Machrone, editor of the American journal *PC Magazine*, will head a cast of celebrity speakers who will be coming from the major software houses, from IBM, and from other hardware suppliers, plus our very own Les Bell will speak on languages. It would be a tragedy to miss a chance to hear brilliant speakers like Les.

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The 50-Mbyte Floppy

The 3M company, mainly associated in many people's minds with sticky tape and similar products, has announced the 3M Stretched Floppy Disk. Not quite a floppy, not quite a hard disk, it has a capacity of 10 Mbytes now, is expected to reach 20 Mbytes by 1986, and 50 Mbytes a year later.

So what does it look like, and how does it work? A traditional floppy disk is made of flexible plastic with a layer of magnetic particles each side. This sandwich is less than 1 mm thick, and is cut into a circle with a hole in the middle, then encased in a square envelope. Hard disks are rigid platters, coated with magnetic material, and permanently sealed inside a housing.

The Stretched Disk is closer to a floppy than a hard disk, being just over 12 cm in

diameter (it's made in the USA, so all dimensions are non-metric — which means it's just over five inches) and nearly 1/10th of an inch thick (errr — that'd be around 2.5 mm, wouldn't it?). A layer of magnetic-coated material is bonded on both sides of this semi-flexible plastic disk.

3M brought a stretched disk from the USA for me to see, and it's fascinating to press gently on its side, forming a dimple which flattens out as soon as the pressure is removed. This flexibility gets over the problem of fragility found with hard disks, and will allow it to be packaged in a way that allows easy changing of disks, as now happens with floppies.

I'm waiting to see it running in a prototype drive (a production drive would be even better), but the nearest running drive is in St Paul, Minnesota, and Matt won't pay for the plane ticket this week.

Seagate is apparently building prototype drives, as are other manufacturers. Let's hope the manufacturers agree on a few common formats, and avoid the chaos that occurred with CP/M and the hundreds of 13 cm formats that were created there.

Where is the Clamshell?

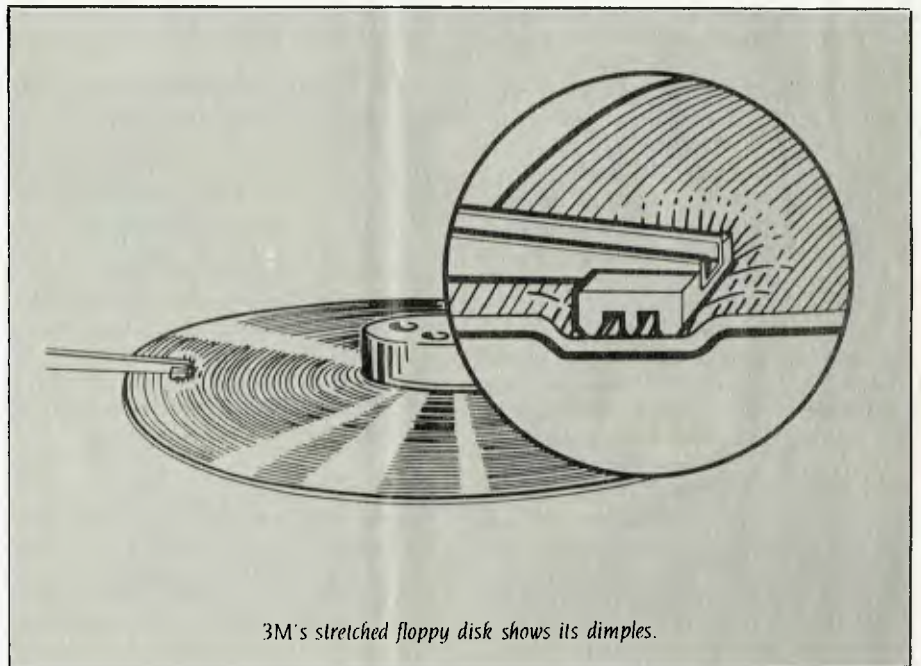
For months now there have been rumours of a lapheld computer from IBM with an LCD screen, and full compatibility with existing software for other IBM PCs. The codename for this machine in all the

rumours is Clamshell. However, it looks now as if the Japanese have got in before IBM; will the Clamshell suffer the fate of the PC jr and the PC Portable, and completely underwhelm the market?

A machine I've come across which will outline the market and get a headstart on the Clamshell is the Toshiba T1100.

Take five copies of *Your Computer* and stack them one on top of the other — the T1100 is as thick as this stack. The magazine is 210 mm by 280 mm, and at 311 mm by 305 mm and weighing 4.1 kg, the T1100 is only a fraction bigger. Before you yawn at yet another lapheld, think of the technical specifications: the processor is a CMOS 8088; the standard memory is 256 Kbytes, with option of 512 Kbytes. A built-in 9 cm floppy drive is standard, and external 9 cm and 13 cm drives have been released as well.

But the real interest is that the T1100 runs MS-DOS and has an 80 by 25 LCD display with 640 by 200 pixels graphics resolution. Wow — just like a desktop IBM! It also has built-in RGB and composite video with connectors on the rear panel, ready to plug in your mono or colour monitor. I've seen Flight Simulator running on the LCD and on a monitor, and hundreds of other programs also are claimed to run (including Lotus 1-2-3). The price starts at under \$3000 — what chance can IBM have if it reaches the market later, and more expensively? □



3M's stretched floppy disk shows its dimples.

IF YOU'RE considering the purchase of a 1701 colour monitor you should bear in mind it won't support the C-128's 80-column mode. This will require an RGB monitor, and Commodore has one on the way, claimed to be switchable between composite video and RGB. Sadly (if you already have one), there is no easy way to modify a 1701 or RGB. You can still use it with the 128 in 40-column mode, or you could re-employ it as a monitor for a video player. In this role it will give a substantially better image than most television sets.

Commodore Modem

Commodore is developing a Viatel-compatible modem. This will be manufactured in Australia (something new for Commodore), and will have the appropriate software built-in. It will allow you to save downloads to disk or cassette. The modem is intended to be 1200/75 Viatel only, and doesn't support 300 baud (which means it won't work with most bulletin boards).

Proportional Daisywheels

Many people have daisywheel printers capable of producing proportional type. This column is typeset in proportional type, and you will notice it looks different from normal typewriter output. The difference is not the character font, but the way the thin letters (like i, l, r) are spaced closer together. The result is easier to read, and you can also fit about 25 per cent more words per page (keeping down photocopying costs).

Unfortunately Easyscript doesn't support this feature. Few of the 64's word processors do, but after looking around I've found one that does: Wordpro 64 from Pro-Line Software. It supports most daisywheels including Silver Reed, Brother, Commodore and Diablo, although you can only get proportional mode on the printers which have that feature.

Wordpro 64 also has a number of other features, including double-column output (useful for club newsletters and the like). The only catch is that nobody seems to be distributing it in Australia! I got mine direct from Pro-Line in Canada. The company takes international plastic money, and you can order by an ISD phone call. Delivery takes two to three weeks, and the program costs \$US50 plus \$US6 for airmail. The address and phone number are Pro-Line Software, 755 The Queensway East, Unit 8, Mississauga, Ontario, Canada.

Most 64s use CMOS chips. These require very low power to drive them, and therefore the machine runs cooler. This encourages chip longevity, but it does make the chips more sensitive to a build-up of oxidisation on the contacts.

Phone (416) 273-6350. It might be wise to order a backup copy at the same time (Canada is a long way away).

Hardware Lockups

Most 64s use CMOS chips. These chips require very low power to drive them, and therefore the machine runs cooler. This is normally a good thing because it encourages chip longevity, but it does make the chips more sensitive to a build-up of oxidisation on the contacts. One symptom of this is when the machine intermittently locks up for no apparent reason. The solution is simple, but only do it if you're out of warranty.

Open up the 64 (three screws underneath), and look at the circuit board. You'll find most of the chips are soldered in. Most models have only two socketed chips, and one of these is likely to be the offender. To remove the oxidisation you don't have to take the chip out — just partially lift one end and then press it down again. Do the same with the other end and repeat the process for the second chip. This is usually all it takes — far cheaper than taking it in for a service. Of course if that doesn't work the problem may be more serious!

BASIC Crashes

Normally it's pretty difficult to crash the 64 from BASIC, but when you do it's often particularly painful to debug. Serious crashes force you to power down in order to recover, leaving few clues to help you.

In general the only BASIC instruction to

be careful with is POKE. Because BASIC accesses variables faster than it decodes ASCII integers, people often use POKE with variables, as in the form POKE A,X. However, if for some reason A happens to equal 0 you will be POKEing into one of the most sensitive locations on the 64: location 0 controls the I/O data direction register. Accidental tampering with it can easily disable the keyboard, which effectively means a crash!

There are other dangerous locations to POKE but they aren't quite so easy to access accidentally. All of zero page (locations 0-255) should be avoided unless you know what you're doing. Only five zero page locations are safe for BASIC POKEing: 2, 251, 252, 253, and 254.

Other sensitive locations are just above colour memory (66296-56296). This is where you find the CIA (a rather unfortunate acronym, which in this case stands for Complex Interface Adaptor). The CIA and adjacent registers also have a lot to do with I/O and timing functions. Algorithms that POKE in colour memory may be the source of a crash if they overshoot into this space.

Similarly if you overshoot when POKEing to screen memory (1204-2024) you can destroy the beginning of your BASIC program. You won't know about this until your program tries to access one of the early program lines, or if you stop and then try a LIST. Strictly speaking this is not a crash, it's merely a corruption of your program, but it's just as fatal, since it's very difficult to recover the program.

SydCom

As some readers may know, I'm actively involved in SydCom, a Sydney-based Users' Group. SydCom operates RCOM ((02) 667 1930), the only Australian bulletin board that supports the sound, colour and graphics of the 64. Apart from a 300 baud modem you will need special software to access the board; you can obtain this by writing to SydCom, GPO Box 1542, Sydney 2001. For \$20 you get the special software, a pile of public domain terminal programs and RCOM registration for one year. You don't need to be registered to use the board, but you can't use all its functions (like up/downloading and electronic shopping) unless you are.

SydCom says it will develop C-16 and Plus 4 terminal versions (no sprites) if there is sufficient demand. So drop a line if you're interested. □

WELCOME AGAIN to the column. Last month I looked at the new 130ST and 520ST. This month, it's the turn of the four new 8-bit machines.

The New Breed

The XE series was announced at the Winter Consumer Electronic Show in Las Vegas earlier this year, somewhat overshadowed by the announcement of the STs. The XE (which stands for XL Extended) range is designed to be fully compatible with the current 600XL and 800XL, and the older 400 and 800 computers.

At the lower end of the range is the 65XE with 64 Kbytes of RAM and built-in BASIC. There are 11 graphics modes, five text modes, player missile graphics and a four-voice sound chip as well as the other traditional Atari features. Closely resembling the 800XL in performance, the 65XE may be destined to become the 800XL's successor. The retail cost in the United States is just \$99.

Next up is the 130XE. It's almost the same as the 65XE, except for an extra 64 Kbytes of RAM, and an extra rear parallel connector. Its retail price will be about \$150.

The 65XEM is basically a 65XE with an additional eight-voice sound chip called 'Amy'. (The 'XEM' stands for 'XE Music Computer'.) Apparently this new 'Amy' chip outperforms the SID synthesiser chip in the Commodore 64. With a dynamic range exceeding 60 decibels and a frequency range of nearly 11 octaves, it can produce sounds from below the human hearing threshold (4.8 Hz) to 7.8 kHz.

Among its other features are frequency resolution of 1/64th semitone and 64 harmonics. It can reportedly synthesise any musical instrument. The cost of the amazing Amy is \$150.

The 65XEP completes the new line of Atari computers. A transportable version of the 65XE, this computer is Atari's challenger to the Commodore SX-64. It has many of the features of the standard 65XE packed into a suitcase-sized package. The lid detaches to become the keyboard, exposing the 13 cm green screen and a 9 cm microflop drive. A rechargeable battery pack provides about three hours of use between charges. This machine should retail at about \$399.

The 65XEP apparently uses the 9 cm microdrives instead of the usual 13 cm drives because Atari found a supplier which could make the mechanisms of the smaller models cheaply. Also, the microflops have a larger storage capacity than the normal disks. The 65XEP retains the standard serial bus, so people who wish to transfer material from the larger disk format can plug in a standard drive.

Assorted Peripherals

Apart from the stunning new range of computers, more peripherals are on the way. One of these is a monochrome monitor with a built-in 80-column video adaptor for the XE series and existing Ataris. It plugs into the serial bus and brings 80-column display within the reach of everyone. One program that can be used on these 80-column monitors is the new AtariWriter Plus, an 80-column version of the incredi-

ble AtariWriter. The retail price for the XM148, as it is called, is \$150.

Also available will be another monitor — the XC141 — a 35 cm composite video colour model for all XE Ataris, costing \$250, and a 300 baud direct-connect modem — the XM 301 — retailing for under \$50.

Six new printers for the XEs are in the pipeline, ranging in price from \$99 to \$150. They include a letter-quality daisywheel printer for \$150 and a dot matrix colour thermal printer for \$99. Future plans include printers and a new monitor for the more complex ST series.

Even though these products were announced earlier this year in Las Vegas, at the rate things change in the computer industry, it is doubtful whether all these products will ever see the light of day. However, keep your fingers crossed and touch wood. We never know our luck.

On the software side, a new package is set to hit the market over the next few months. Designed by Atari, it is a database called 'Infinity'. A truly relational database (or so they tell us), it is reportedly able to store hundreds of thousands of pieces of data. Although it's been designed to work on the new ST series, a version for the XE range is now under development.

Please note all prices quoted here refer to US dollars.

CompuClub

CompuClub is an American club for Atari users. The annual fee is US\$15 and is payable by cheque, Mastercard or Visa. Membership entitles you to a copy of its newsletter several times a year, and gives you 25 per cent off the retail price of all Atari products. You also get the group's catalogue in booklet form and on disk. I'm told the disk contains more information than the booklet and is more comprehensive. However, as I only have Revision A ROM in my Atari I can't use the disk catalogue. You can order a Revision B from CompuClub for \$19.95. When that arrives I'll be set.

If you wish to join CompuClub, send payment to: CompuClub, PO Box 652, Natick, MA 01760, USA. Or, if you're charging to a credit card, you can place your order by phoning USA 617-879-5232.

That's it for another month. Next month I'll write a special column on Telebank, a new Commonwealth Bank service. If you want to write to me about anything — particularly if you want help in solving an Infocom adventure — my address is: PO Box 594, Maryborough 4650. □

PSSST!
Wanna job at
Your Computer?
Take a look at page 13

THERE SEEMS to be lots of activity at Applied Technology since the Sydney PC show. First, the new store in Newcastle has opened, and there are consistent rumours of a New Zealand branch opening in the very near future.

AT has been swamped with people taking advantage of its offer to upgrade any tape-based Microbee to a Computer-in-a-Book for \$495. It's certainly a worthwhile price decrease, motivated by a need to get the 6116 chips out of early machines, or perhaps just by an oversupply of mini disk drives. Whatever the reason, the consumer wins and the exercise shows just how valid AT's upgrade policy is.

If you're in the market for a daisywheel printer, have a good look at the unit AT is offering for only \$399.99. That's just half the amount I paid two years ago for my Brother HR-15.

AT's move to new offices in Waterloo Road, North Ryde, will not only reduce the overcrowding of the the offices at Gosford, but should help eliminate some of the crippling freight charges encountered by AT in sending parts to and fro between Sydney and Gosford. I understand that in future all AT's stores will carry a number of baseboards and a variety of coreboards and built-up disk systems, to enable purchasers to take home a machine which is virtually put together on the spot. I only hope the documentation catches up with this excellent idea.

Rumour has it the Microbee bulletin board system will initially be used for communication between offices, and you may have to wait some months before a public system is operating. Meanwhile, some of the larger Microbee user groups in Australia have been looking at starting their own bulletin boards, and the Adelaide User Group has already secured a large portion of a public domain board in its area. Sydney's Prophet board has much Microbee material, although I've already annoyed one or two of its operators by suggesting they should check with the writer of a program first before committing his or her program to the board.

Continuing development at AT means more new Microbees are on the drawing boards, including machines with built-in hardware and software to talk with the Viatel system. Rumours of a completely

dot-addressable screen on future Microbees and an enhanced BASIC are also a distinct possibility. Colour boards will be included eventually as a standard feature — probably to coincide with the release of Applied Technology's own colour monitor. A prototype monitor was shown at PC '85 and gave a very good display.

At long last the very basic (no pun intended) Typing Tutor program which AT has been selling for the past two years is about to be superseded by a much better, professionally written package. (I'm entitled to cast aspersions on the original since I wrote it after I'd had my Bee for only three months, and I can now see the many examples of poor programming it contains.)

On the subject of programming, we'll look at some of the problems with Micro-world BASIC — with particular regard to strings which disappear when used in arrays.

Try the program in Listing 1; type it in and run it. There will be no problems and the two strings will be printed in full. Now change line 110 to SD 4 and run the program again. Where did the Microbee go? It wasn't printed due to the fact that Micro-world BASIC treats string arrays with the same conditions as real arrays. Normally, using SD 8, we assign five bytes to each variable position to indicate where the string will be positioned in memory and its length, plus an end-of-string byte and a byte to indicate this is an array. This requires the full five bytes. However, at SD 4 we assign only three bytes to each string, and the important length byte is eliminated. Therefore whenever you use a string array, make sure you do not set SD equal to 4.

Sources of Information

I have had a request for details about sources of information for Microbee owners trying to increase their knowledge of computing, so here is a partial list of some of the best sources. First, have a good look at the Wildcards series of books, which contain a wide variety of hints, tips and programs. Volumes one through three are all excellent, and by the time you read this, volume four, dealing mostly with games and game routines, should be on sale.

Assembly language programmers

should take as their reference work Rodney Zaks's large and quite inexpensive book *Programming the Z80*, and two books by Lance A Leventhal, *Z80 Assembly Language Programming* and *Assembly Language Subroutines*, are worth reading. The small book *Microbee Assembly Language Programming*, by Lewis Badham (available through *Your Computer*) contains details of many routines in the BASIC ROM which you can access, but disk system owners may be a little disappointed.

For general hardware, the *Microbee Hackers' Handbook* (also available through *Your Computer*), has lots of hardware modifications and projects, while Applied Technology really seems to be getting its act together with a wide range of new manuals and publications. Its own house magazine, *On-Line*, is well worthwhile, despite the lack of much in the way of hints and tips (although I'm trying to rectify this).

There aren't many books containing good programs on the market, but a new book from AT called *The Winners* contains listings of all the winning programs submitted to SMUG for its competition last year, and could be a handy programmer's reference book.

It's a pity there is no really good manual available for AT's Editor-Assembler, as it's a really powerful program with many excellent features. Only two bytes need to be altered in the disk version to give a true 24-line screen display, but this has not been implemented by AT at this stage. For those familiar with the use of the DDT editor, change the bytes at 588 and 81C 18.

Feedback, as always, is required from you to indicate what you want to read in this column. I have a good range of material at my fingertips from the many excellent user groups' publications, and I also have most of AT's publications — so just ask and I can probably provide the information you want. □

Listing 1

```
00100 REM Disappearing Strings by C.T.
00110 SD 8
00120 DIM A1(2)
00130 A1$(1) = "Microbee"
00140 A1$(2) = "Made by Applied Technology"
00150 PRINT A1$(1),A1$(2)
00160 END
```


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BMS/CC365

CP/M PLUS (or CP/M Version 3) has a large number of features and facilities that make it a significant improvement over CP/M Version 2.2. The CP/M Plus Users' Guide makes a much better job of explaining the system than earlier Digital Research manuals ever did, but there are still a lot of things left unclear.

One point not mentioned in the user guide is that it isn't always necessary to type the full option for the command. For example, to get a full directory listing, with entries sorted and size information included, the command is DIR [FULL]. The manual says the closing '[' can be left off, but in fact the command can be shortened to DIR [FU. Most other commands can be similarly shortened, but some experimentation will be needed to find out just how much of the option needs to be entered.

The preset definitions for the special function keys all require you to press Return after selecting the key for the function you require. For some commands this may be necessary to enable an option to be appended to the command, but for others such as SETUP, there is no reason why the

I tried to include two commands on a single key by separating them with a carriage-return, but the second command was ignored. If someone can make this technique work I'd like to hear about it.

Return should not be included in the function key definition. To do this use the SETUP program to modify the key definitions, and add a hex code 'D' (control character 'M') to the end of the command. The hex 'D' is selected using the right arrow to move the cursor along the row of characters, and pressing the Linefeed key when the arrow is pointing at the correct character.

I tried to include two commands on a single key by separating them with a carriage-return, but the second command was ignored. For instance, DIR A:<CR>DIR B: should display the directory of drive A, pause waiting for Return to be entered, then display the directory of drive B. If someone can make this technique work I'd like to hear about it.

Keyboard Uses the CPU

The Bondwell keyboard doesn't use a custom keyboard-encoding chip to translate key presses into characters, but instead uses the Z80 CPU to scan the keyboard and detect which keys have been pressed. This information is used to look up a table that is stored in memory in order to find the character corresponding to the key.

While this means the CPU sometimes misses keystrokes, it does have the advan-

tage that any key on the keyboard can be assigned to any character. It would even be possible to turn the keyboard into a Dvorak style — the hardest part would be removing and replacing the keytops.

To demonstrate how useful this facility might be, Listing 1 is a short program that will convert the shifted cursor control keys into different codes. The standard keyboard definition doesn't distinguish between shifted and unshifted for the numeric keypad and the cursor control keys; this is to enable cursor control even when the 'Alpha Lock' switch is on. However, if you have software which assumes certain control codes for the cursor control keys it may be easier to redefine the arrow keys, at least in shifted mode, than to re-install your software to recognise the standard key codes.

Enter the program into a file called KEYS.ASM using the 'N' option of Wordstar. Copy it to your CP/M system disk 2, and assemble it with the command MAC KEYS; then convert it to a .COM file with the command HEXCOM KEYS. Execute it by simply typing KEYS. The program will return to the CP/M prompt. The codes to be inserted in the example are the letters A, B, C and D, which are unlikely to be useful but serve to demonstrate the process and enable you to test that the program has worked. Shift/Up-Arrow should give A, and so on.

When it tests out OK you can re-edit it to insert the actual codes you want these keys to represent, then recompile it and copy the KEYS.COM file to the disk you will use it on. At some future stage I'll publish the addresses of all the keys so more extensive re-coding can be done.

One other key that is well worth redefining is the CL key on the numeric keypad. This serves no purpose in its current definition and should be set up as the vertical bar, which is currently at Shift/0. The shifted CL can be left as it is. The address of CL is 0ecf5h. □

YOUR BONDWELL LISTING

Listing 1 - Alter shifted arrow key codes.

```
org 0100h
    lxi    h,tbase    ;point hl at table
loop:  mov    a,m      ;get the character
       cmp    0       ;is it a zero?
       rz    exit,otherwise
       inc    h       ;point to table
       mov    e,m     ;address entry and load
       inc    h       ;address into de.
       mov    d,m
       inc    h
       xchg    ;swap de and hl, and
       mov    m,a     ;put character at address.
       xchg    ;swap de and hl back.
       jmp    loop    ;and go get the next one
tbase: db    'A'      ;up arrow character
       dw    0ed4ch   ;up arrow address
       db    'B'      ;down arrow character
       dw    0ed4dh   ;down arrow address
       db    'C'      ;left arrow character
       dw    0ed44h   ;left arrow address
       db    'D'      ;right arrow character
       dw    0ed45h   ;right arrow address
       db    0        ;end of table marker
end
```

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One of the best places to get information and help with a particular machine is through a computer user group or club. Such little pockets of wisdom are scattered throughout Australia, as you can see from this listing which we'll be publishing every couple of months.

Australian Capital Territory

ACT Apple Users' Group, Ernie Kruck, GPO Box 1231, Canberra City 2601, (062) 86 1208.

ACT Micro 80 Users' Group, Bill Cushing, 10 Urambi Village, Kambah 2902, (062) 31 3630.

ACT PC Users' Group, Nick Hammond, PO Box 188, Parkes 2600. Meetings last Monday each month at Reid Tafe, 8.00 onwards. (062) 86 1102.

ACT VIC-20 Users' Association, Chris Groenhout, 25 Kerferd St, Watson 2602. Meetings first Monday each month at Boys' Grammar Scout Hall, Red Hill, 7.30 onwards. (062) 41 2316.

ACTARI, Chris McEwan, co-ordinator, ACTARI, PO Box E112, Canberra 2600, (062) 88 7861

Apple User Group (ACT), Jeff Brock, 1 Buckley Circuit, Kambah 2902, (062) 31 3630.

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, Meets 7.30pm on first Tues of every month at Woden Valley High School Library. Bill Horsfall (062)583193. PO Box 227, Weston Creek, ATC 2611.

Canberra Micro-80 User Group, Milt Cottey, 33 Crawford Cres, Flynn 2615; meetings third Monday each month, 7.30 pm, in the small theatre, Reid TAFE, for System 80, TRS80 and so on. (062) 58 8822.

Canberra NEC Users' Group, Mal Smith, PO Box 173, Belconnen 2616; meets first Tuesday each month at Main Conference Room, CSIRO Headquarters, Limestone Avenue, at 7.30. (062) 54 1614.

Canberra Osborne Group, c/o Geoff Cohen, PO Box 136, Kippax 2615. (062) 54 7608.

Kaypro User's Group (ACTKUG), meets on the third Thursday of each month from 6.30 pm in the J Block theatre, Canberra TAFE, Constitution Avenue, Reid. Contact

Des Ireland, on (062) 47 5330.

Micsig, Registrar, PO Box 446, Canberra 2601.

PC Users' Group (for users of IBM PC and similar machines); meets on the last Monday of each month at 8 pm in the main theatre, Building J, Canberra TAFE. Contact address: PO Box E188, Parkes, ACT 2600. Sirius/Apricot User Group, M J Sim, 253 Hindmarsh Drive, Rivett 2611; meetings 7.30 pm third Tuesday each month, 88 Wollongong Street, Fyshwick 2609.

New South Wales

Albury-Wodonga District Microbee User Group, Eric Eulenstein, 202 Kooba St, Albury 2640, (060) 25 1601.

APF Users' Group, Norm McMahon, 288 Kissing Point Road, Turrumurra 2074, (02) 44 2645.

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

Apple Users' Group, Colin Rutherford, PO Box 505, Bankstown 2200; meets 6.30 pm second Monday of each month (Tuesday after public holidays) at Sydney Grammar School, Stanley Street, Sydney. (02) 520 0926.

Atari Computer Enthusiasts, Tony Reeve, PO Box 4514, Sydney 2001.

Ausborne, The Secretary, PO Box C530 Clarence Street, Sydney 2001; meetings third Wednesday each month at 6.30 pm in the North Shore Council Chambers, Cnr Miller and McLaren Streets, North Sydney 2060. (02) 95 5378.

Ausbug, Stephen Ford, PO Box 62, Londonderry 2753.

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

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

BBC Educational Users' Group of NSW, Dick Cleary, PO Box 939, Darlinghurst 2010, meets 7.30 pm third Wednesday of each month at various locations.

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

Blue Mountains Computer Club, Ioe McKay, 25 Reserve Avenue, Blaxland 2774, (047) 39 3154.

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

Casio PB 700 User Group, Terry Gill, 35A Kent Street, Regent Park 2143, (02) 644 4115.

Central Coast Apple Users' Group, C W Lee, 662 The Entrance Road, Wamberal 2260; meetings first Tuesday each month at the Niagara Park Public School from 7.30 pm. (043) 84 3419.

Central Coast Microbee Club, Max Maughen, PO Box 36, Ettalong Beach 2257 first Tuesday every month at Applied Technology, West Gosford. (043) 24 2711.

Compucolor Users' Group, Tony Lee, 52 Cowan Road, St. Ives 2075, phone (02) 449 8824.

Cooma Microbee User Group, Phil Zikan, PO Box 92 Cooma 2630, (064) 82 3315; meets on the second Friday of the month. Cumberland Computer User Group, S O'Neil, (02) 682 3851.

dBase Users' Group, PO Box 297, Neutral Bay Junction 2089; meets every second Tuesday each month at the Cowper Room, St. Andrew's House, corner Bathurst and Kent Sts, Sydney.

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

Dubbo and District Microbee Users' Group, Coralie Taylor, 18 Cunningham Street, Dubbo 2830; meets fourth Wednesday each month at 7.30 pm in the Dubbo High School Computer Room.

Griffith Computer Association, Ron Gauci, PO Box 425, Griffith 2680, (069) 62 5877.

Hawkesbury Commodore Computer Club, Richard Farrell, 12 Inverary Drive, Kurmond 2757; meets fourth Tuesday of each month at 7.30 pm at Neighbourhood Centre, West Market Street, Richmond 2753.

Hawkesbury Microbee Computer Club, Bruce Rennie, 6 Warks Road, Kurrajong Heights 2758; workshops 7.00 pm third Friday, and general meetings 7.30 pm first Friday of each month in the Microbee Network Room, Library Building, Richmond High School, Cnr Penrith and Lennox Streets, Richmond 2753. (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 Users' Group — All Microcomputers, Secretary, PO Box 39, Broadmeadow 2298; meets on the second Wednesday of each month in Room 308, Building W, University of Newcastle, at 7.45 pm. Membership is primarily Apple II oriented, 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, PO Box 1775, Wollon-

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gong 2500.

Macarthur Computer Association, I Napier, 23 Athel Tree Crescent, Bradbury 2560; meets first Monday each month at Airs High School, Briar Road, Campbelltown 2560, at 7.30 pm 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 Enthusiasts' Group), John Whitlock, PO Box 1309, Chatswood 2067; meetings third Monday each month at rear of St Andrew's Presbyterian Church, 37 Anderson Street, Chatswood 2067, (02) 638 1142.

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, Angus Bliss, PO Box 293, Hamilton 2303; meetings 7.30 pm second and fourth Monday each month at Room G12, Physics Building, Newcastle Uni. (049) 67 2433.

NSW Primary School Microbee Users' Group, Mr Peter Stretton, c/- Hunters Hill Primary School, Alexandra Street, Hunters Hill 2110.

NSW 6800 Users' Group, 27 Georgina Avenue, Keiraville 2500.

Northern Beaches VIC User Group, E. Tuxford, 161 Barrenjoey Road, Newport 2106, (02) 997 2467.

Northern NSW MICC Chapter, Alen Hartley, Dundurrabin via Dorrigo 2433, (066) 57 8160.

Hitachi/6809 User Group, meets on the first Saturday of each month, at 2 pm; contact Robert Lohr on (02) 662 4150, after 6 pm for locations.

OSI Users' Group, Nigel Bisset, (02) 411 7142.

Pocket Computer Users' Club, George Antonijevic; for those interested in pocket computers, whatever the brand. Meetings held on the first Wednesday of each month at 7.30 pm at the Woodstock Community Centre, Church St, Burwood 2134, (02) 683 4296.

Sirius/Apricot User Group, Wayne Collom, Barson Computers, Unit D, 55 Talavera Road, North Ryde 2113, (02) 888 9444.

Sorcerer Users' Group, PO Box E162, St James 2000; meetings third Friday each month at 8.00 pm in Greenwich Community Hall, Greenwich Road, Greenwich 2065.

Southern Districts Commodore Users' Group, Lex Toms, 3 Lucille Crescent, Casula 2170; meetings first and third Wednesdays each month, API Hall, Currajong Road, Prestons 2170. (02) 602 8691.

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

Sydcom 64 (C64 User Group), Philip Dean, GPO Box 1542, Sydney 2001; meets on the second Wednesday of each month at the Abraham Mott Hall, Argyle Place, Miller's Point.

Sydney Forth Group, Peter Tregeagle, 10 Binda Road, Yowie Bay 2228; meets second Friday of each month at 7.00 pm in the John Goodsell Building, UNSW room LG19. (02) 524 7490.

Sydney Kaypro Users' Group, Hans Schneider, C/O Dr H. Schneider, Geography Department, UNSW, PO Box 1, Kensington 2003; meetings second Tuesday of each month, 8.00 pm, Burwood RSL Club. (02) 697 4400 (w) or (02) 309 2961 (h).

Sydney Lotus 1-2-3 User Group, Ron Polak, (02) 29 5316.

Sydney Microbee Users' Club, Colin Tringham, PO Box C233, Clarence St, Sydney 2000; meetings third Saturday each month 1-5 pm, Strathfield Girls' High School, (02) 92 6408.

Sydney Northside Apple Users' Group, Philip Webb, meets first Tuesday each month 6.30 to 8.30 pm, Willoughby Council Library, 411 Victoria Avenue, Chatswood 2067. (02) 419 3294.

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

Sydney TRS80 Users' Group, meetings second, third and fourth Saturday of each month at Botany. (02) 666 4716 bh.

TAG — The Access Group, Bob Dolton, PO Box 943, Orange 2800; for Access and Actrix users.

The Great Western Computer Users' Group Jim Graham, PO Box 210, Wentworthville 2145; (02) 636 9219. All micro users are welcome. A 40-minute beginner's session is held at the beginning of each meeting. The club meets on the first Tuesday of each month, at 8 pm.

Western Sydney PC and Compatible User

Group, Ben Sharif, (047) 36 4825; meets on the third Sunday of the month at 27 Cosgrove Crescent, Kingswood 2750.

TI Sydney Home Computer Users' Group, PO Box 149, Pennant Hills 2120.

Tuggerah Lakes Computer Users' Group, Frank James, 125 Woolana Avenue, Budge-woi 2262; meetings second Thursday each month at Old Primary School, Wyong, at 6.30 pm. (043) 907 339.

Wagga Microbee Users' Group, John Simmons, 47 Undurra Drive, Glenfield 2650; meetings first and third Tuesdays each month in the Tolland-Glenfield Neighbourhood Centre at 8.00 pm. (069) 31 1302.

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

ZX-Spectrum Users' Club, Craig Kennedy, PO Box 466, Epping 2121.

Victoria

Apple Users' Society of Melbourne, D Halprin, PO Box 43, Forest Hill 3131, (03) 387 3221.

AT Microcomputer Club, Grant Forest; this club has been formed for people interested in the Applied Technology DGOS Z80; (03) 879 2257 ah, (03) 699 2888 bh.

Atari User Group Melbourne, Kelvin Eldridge, PO Box 173, Reservoir 3073.

Australian Forth Interest Group, Tony Latermore, PO Box 704, Sale 3850, (051) 44 2011.

Australian North Star Users' Association, PO Box 194, Wangaratta 3677.

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

Billanook Computer Forum, Maurie Canterbury, Cardigan Road, Mooroolbark 3138, (03) 725 5388.

BUG 80 (Burwood Users' Group), PO 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, PO Box 103, Camberwell 3124; meets on the first Friday of the month at the Bowen Street Neighbourhood Centre, 102 Bowen Street, Camberwell South 3124. (03) 29 2600.

Geelong Commodore Computer Club, D Gerrard, 15 Jacaranda Place, Belmont 3216, (03) 44 2863.

Geelong Computer Club, Colin Lowne, PO Box 520, Geelong 3220; (052) 55 1232.

Meets at 8 pm, on the first and third Friday of each month in the rooms of the Geelong Amateur Radio Club, Storrer Street, East Geelong.

IBM & Columbia Computer Users' Club, Giles Bray, 22/11 Auburn Grove, Hawthorn East 3123; meets second Tuesday each

Is your club listed? Think of our tens of thousands of readers waiting to join a club just like yours. Ring Felicity Skinner on (02) 662 8888, or write to us at 'Your Computer' PO Box 227, Waterloo 2017.

month, 7.30 pm, at the Victorian College of Pharmacy, (03) 82 7632.

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

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

Latrobe Valley Colour Computer Users' Group, George Francis, 31 Donald Street, Morwell 3840; for TRS80 and MC10 users. (03) 22 1389.

Melbourne Atari Computer Enthusiasts, PO Box 133, Mulgrave North 3170; meetings held on first Sunday of each month at 11.40 am at Monash University Rotunda.

Melbourne Lotus 1-2-3 Users' Group, Robert Taylor, (03) 267 4800.

Melbourne Microbee Users' Group (MBUG Australia Inc.), President: Grant Forrest, PO Box 157, Nunawading 3131; meets at 7.30 pm on the second Wednesday of each month at Mount Waverley Community Centre, Cnr Miller Crescent and Stephenson's Road, Mount Waverley. Different types of membership, including country, bulletin board, city, and student.

Melbourne PC User Group, Stephen Wagen or Christopher Leptos, c/o Pannell Kerr Foster, 14th Floor, 500 Bourke Street, Melbourne 3000, (03) 605 2222 bh.

Melbourne Hitachi Users' Group, Branko Colavizza, PO Box 191, Rosanna 3084, (03) 434 2541.

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

MICOM (Microcomputer Club of Melbourne), PO 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, PO Box 148, Glen Waverley 3150.

National ZX80 Users' Club, 24 Peel Street, Collingwood 3066.

NEC Portable Users' Group, D Green; meetings second Wednesday of each month at Myers Computer Centre, Lonsdale Street, at 7.30 pm. (03) 611 3380.

Northern/Western Suburbs Computer Users' Group, John King (Secretary), 284 Union Road, Moonee Ponds 3039. Contact CP/M Data Systems, (03) 338 9304.

Peninsula Computer Club, George Thompson, 3 Patterson Street, Bonbeach 3196; meets second Tuesday each month at Chisholm College, Frankston 3199; many types of computers catered for. (03) 772 2674.

Seymour-Pucka Computer Club, Garry Sutton, 25 Malaya Road, Puckapunyal 3662; (057) 93 1091.

Sharp Computer Users' Association, The President, 7 Faye Street, East Burwood 3151.

Spectravideo Users' Group, Mitch Raitt, 3

Clivejay Street, Glen Waverley 3150, (03) 233 2357.

Sorcerer Computer Users' (Australia), Secretary, GPO Box 2402, Melbourne 3001. **TI-99/4A Users' Group Melbourne**, Wayne Worlidge, 123 Ashburn Grove, Ashburton 3147, (03) 25 1832.

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

Upper Yarra Computer Reference Group, for microcomputer enthusiasts and educators. Contact Albin Wallace, Woori Yallock Education Centre, (059) 64 6617.

Victorian Association of Computer Educators, Arthur Totrall, PO Box 69, Whittlesea 3757.

Victorian Osborne Users' Group, Bill Baker, PO Box 169, Camberwell 3124, (03) 850 4187.

Victorian VZ-200 User Group, Luigi Chiodo, 24 Don St, Reservoir 3073, (03) 460 3770.

Victorian Wizzard Users' Group, Barry Klein, 24 Russell Street, Bulleen 3105, (03) 850 7275.

Wizzard User Group, for owners of Dick Smith Wizzard and Funvision computers. The group operates only by mail and phone at present. Contact Barry Klein, 24 Russell Street, Bulleen 3105, (03) 850 7275.

Yarrowonga Computer User Group, Chris Younger, 10 Witt Street, Yarrowonga 3730, (057) 44 385; for all machines.

ZX81 Software Exchange, c/- Chips Taens, 5 Muir Street, Mount Waverley 3149.

Queensland

Adventure Club, Christine Ogden, 37 Samford Road, Leichhardt, Ipswich 4305; for all Adventure-type game players.

Adventure Special Interest Group, Ernie Sugrue, PO Box 594, Maryborough 4650.

Apple-Q — The Brisbane User Group, The Secretary, PO Box 721, South Brisbane 4101, meetings every third Sunday of month at Hooper Education Centre, Kuran Street, Wavell Heights 4012. Centre is open from 8.30 am till 4.30 pm; members encouraged to bring Apple along.

Australian Sirius Users' Group, PO Box 204, Chermiside 4032; looks after the needs of Sirius One and Victor 9000 computer users; (07) 350 2611.

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

Brisbane Medfly Users' Group, K J Walker, 120 Highgate Street, Coopers Plains 4108.

Brisbane Sinclair (Spectrum) Computer Club, V Lewis, 37 Samford Road, Ipswich 4305; meets third Sunday at Everton Park State High School, at 2.00 pm (07) 355 7809.

Brisbane Super 80 Users' Group, Gary Gattfield, (08) 355 3173.

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

Cairns District Microbee Users' Group, Chas Eustance, 21 Marr Street, Edmonton 4869, (070) 55 4531.

Commodore Computer Users' Group Queensland, Mrs D D Dillan, PO Box 127, Stones Corner 4120.

Commodore Users' Group, John Egan, PO Box 274, Springwood 4127; for owners of Pet/CBM and VIC-20 machines. Meetings held on the first Tuesday of the month at 130 Petrie Terrace, Brisbane 4000. (07) 287 2705.

Computer Owners' Group, Betty Adcock, 42 Lucan Ave, Aspley 4034; meets second Wednesday each month, 7.45 pm; all kinds of computer are catered for. (07) 263 4268.

DEC Personal Computer Special Interest Group, see NSW entry.

Gold Coast Microbee User Group, Col McLaren, 1/100 Imperial Parade, Labrador 4215; meetings first Sunday each month, 3.00 pm, at the Southport High School. (075) 31 4610.

IREE Microcomputer Interest Group, N Wilson, PO Box 811, Albion 4010.

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

NEC User Group, David Clark, 18 Provence Street, MacGregor 4109, (07) 343 7680; meets on the first Friday of each month.

Osborne Users' Group of Queensland Uni, Glen McBride; meetings second Thursday each month, open to all. (07) 371 4243.

Southport Commodore Computer Users Group, Bill Fitzpatrick, PO Box 790, Southport 4125, (075) 32 0061.

Superboard Users' Group, Ed Richardson, 146 York Street, Nundah 4012.

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

The Microcomputer Society, The Secretary, PO 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, South Brisbane 4101. Meetings start at 7.30 pm; if main gate is closed use the back stairway.

Townsville Microbee User Group (TMUG), Mannie Van Rijswijk, PO Box 5751 MC, Townsville 4810; meetings 7.30 pm on second and fourth Mondays each month on the Ground Floor, St Margaret Mary's Secondary School, Crowle Street, Hermit Park 4812.

TRS80/System 80 Computer Group, Secretary, 16 Laver Street, Macgregor 4109; meets first Sunday each month at Lindum Hall, Lindum Street, Lindum 4178, at 2.00 pm. (07) 343 5771.

University of Queensland Osborne User's Group, Glen McBride (president) (07) 870

1177, or Richard Duczmal (treasurer) (07) 377 3139; meets on the second Wednesday of the month, in the Axon building on campus. Membership is open to both students and non-students.
VZ-200 Pacific Region Club, I D'Alton, 39 Agnes Street, Toowong 4066, (07) 371 3707.
ZX81 Club, P Cairswell, 22 Braud Street, Bundaberg 4670.

South Australia

Adelaide Atari Computer Club (AACC), Secretary, PO Box 333, Norwood 5067; meets at Gilles Street Primary School, City, on first Monday (second if first is on public holiday) of each month.
Adelaide Lotus 1-2-3 User Group, Paul Wragg, Pannell Kerr Foster, GPO Box 1969, Adelaide 5001.

Adelaide Micro User Group, R G Stevenson, 36 Sturt Street, Adelaide 5000; for TRS80 and System 80 users.
Adelaide Osborne Group, Russell Barter, The Secretary, 410 Regency Road, Prospect 5082.
Adelaide Sega User's Group, Jamie Andersen, (08) 263 5020 (after 4 pm); meets on the first and third Wednesdays of the month, from 7 pm, at the Lutheran church hall, 137 Archer Street, North Adelaide.

Beebnet, BBC and Econet User Group PO 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 group's market requirements.

Commodore/VIC Computer Users' Association, Mr Eddie Hann, 13 Miranda Road, Paralowie 5108; the SA branch meets monthly.

Compucolor-Intecolor Users of South Australia, PO Box 86, Torrensville 5031, (08) 352 3296.

DEC Personal Computer Special Interest Group, see NSW entry.

IBM-PC South Australia Users' Group, PO Box 68, Walkerville 5081

Kaypro User Group, Ralf Engler, 16/34 John Street, Payneham 5070.

Microbee Users' Group of South Australia (MUGSA), The Secretary, GPO Box 767, Adelaide 5001.

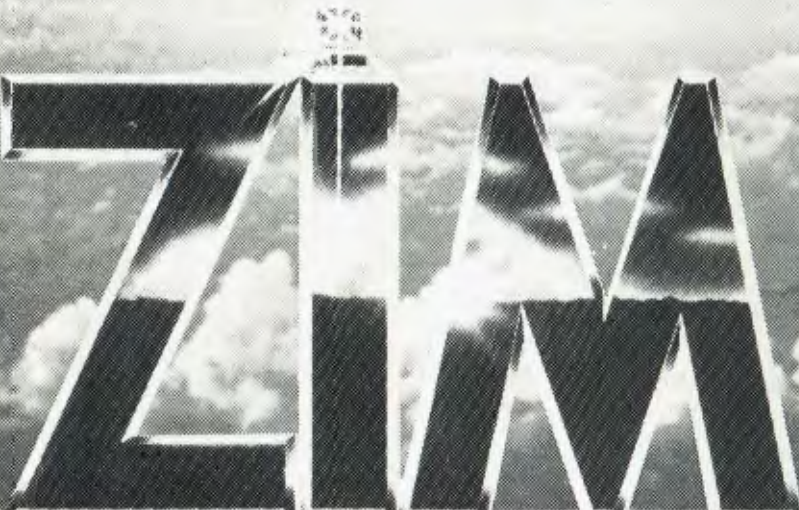
South Australian Apple Users' Club, I.H. Bagust, c/o The Bookshelf, 169 Pirie Street, Adelaide 5000, (08) 293 7183; meets on the first Friday of each month in the Prospect Town Hall.

South Australian Commodore Computers' User Group, Eddie Hann, Secretary, PO Box 427, North Adelaide 5006; meetings second Tuesday each month, 7.30 pm, at Royal Caledonian Hall, 379 King William St, Adelaide 5000. (08) 258 6367.

South Australian Foundation for Computer Literacy, Michael Kennett, PO Box 210, Norwood 5067; caters for children from six years (unaccompanied) or four years with older friend or brother or sister. Special emphasis on the needs of handicapped, educably disabled and socially disadvantaged children, but *all* children welcome. Family participation encouraged. (08) 51 5474.

South Australian Peach User Group, Geoff Drury, 27 Creslin Tce, Camden Park 5038; special interest group attached to the SA Microprocessor Group, which holds separate meetings; (08) 295 2778 ah.

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South Australian Microprocessor Group Inc (SAMG), The Secretary, PO Box 113, Plympton 5038, (08) 278 7288.

Sorcerer Users' Group of South Australia, Don Ide, 14 Scott Road, Newton 5074.
South Australian Apple Users' Club, The Secretary, c/- The Bookshelf, 169 Pirie Street, Adelaide 5000.

South East Computer Enthusiasts' Group, Glenn Mibus, 3 Millard St, Mount Gambier 5290; meetings second and fourth Tuesday of each month from 6.30 pm at Mt Gambier High School Computer Room, for all machines and interested parties. (087) 25 1046.

Northern Territory

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

Darwin Microbee Users' Group (DBUG), Felino Molina, PO Box 3111, Darwin 5794, (089) 82 5613 bh, (089) 88 1455 ah.

Northern Territory Computer Club, Ian Diss; meets at Wulagi Primary School on the first and third Thursday of each month at 7.30 pm. Users of all machines and other interested parties welcome. (089) 27 9208.

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

VZ-200 Users' Club, 7 Abbott Crescent, Malak 5793, (089) 27 2830.

Western Australia

Agriculture Users' Group, c/- Mr R Fenwick, Dept. of Agriculture, Albany 6330. For farmers and the agriculture service industries.
CU West WA CompuColor/Intecolor Users' Group, John Newman, 8 Hillcrest Drive, Darlington 6070.

DEC Personal Computer Special Interest Group, see NSW entry.

KAOS-WA, Gerry Ligtermoet, 39 Cloister Ave, Manning 6152; for Ohio Scientific Users. (09) 450 5081.

Kaypro User Group of Western Australia, Ainslie Sharpe, PO Box 91, Claremont 6010; meetings second and fourth Mondays of each month in the Canteen of the Department of Agriculture, Jarrah Road, South Perth 6151. (09) 384 5511.

Microbee Users' Group of Western Australia, The Secretary, 4 Garnkirk Road, Greenwood 6024, (09) 447 5366.

OSWEST-Osborne Users' Group of Western Australia, Mal Ferguson, PO Box 199, Mundaring 6554; meets first and third Wednesdays at the Palmyra Recreation Centre and the Subiaco Exhibition Hall re-

spectively from 7.30 pm, for Osborne and other interested computer users. (09) 295 1449.

Perth 80 Users' Group, C Powell; for System 80 and TRS80 users. (09) 457 6849.
Perth Hitachi Peach Club, The Secretary, 1 Charf Court, Riverton 6155; for Hitachi Peach and 6809s. (09) 367 5880.

Sharp PC Users' Group, John Paulic, PO Box 79, Gosnells 6110, (09) 398 6303.
Sorcerer Computer Users of Australia, The Secretary, 90 King George Street, South Perth 6151, (09) 367 6351.

The West Australian Atari Computer Club, Mr Alf Gaebler (Secretary), PO Box 7169, Cloisters Square, Perth 6000.

VIC-Ups, G. Padfield, (09) 451 4629.

Western Australian Wizzard Users' Group, John Reid, 13 Wenlock Road, Wattleup 6166, (09) 410 2359.

Western Australian ZX Users' Group, Phil Taylor, (09) 328 4111 bh.

Western Australian University Computer Club, 2nd Floor, University of WA, Guild Building, (09) 386 1455.

Tasmania

DEC Personal Computer Special Interest Group, see NSW entry.

Devonport Computer Interest Group, John Steveson, RSD 422, Sheffield 7306, (004) 92 3237.

Down Under Atari User Group; contact Robert Bronstein, 191 Rokeby Street, Howrah 7018.

Spectravideo Computer Users' Group, Mr W P Decket, 48 Heather Street, Launceston 7250; membership costs \$15, which entitles members to a newsletter and to discounts on computer equipment. (003) 44 4836.

Tandy Hobart Users' Group, Ms KJ Rees, GPO Box 1271 N, Hobart 7001, (002) 72 1426; meets on the third Thursday of each month — contact Ms Rees for details of venue.

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

Tasmanian Apple Users Group, Ray Williams, PO Box 188, North Hobart 7008, meets third Tuesday each month at 8.15 pm, 73 Murray Street, Hobart.

Tasmanian TI User Group, Co-ordinator, 1 Benboyd Court, Rokeby 7019; meetings third Sunday of each month at University of Tasmania, room 373. (002) 29 4009.

TAS-Micro, Peter Deckert, 1/456 West Tamar Road, Riverside 7250.



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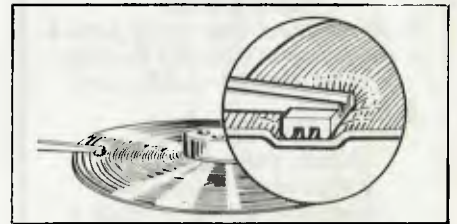
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Results E

Hewlett Packard LaserJet

At recent computer exhibitions there has been a spate of laser printers shown — even though most have been for display only. One that has been released and is definitely available, although in rather short supply, is the Hewlett Packard LaserJet, priced at about \$6300. This compares favourably with other laser printers, and although the price may seem high, you get a lot for your money.

One big advantage of Lotus 1-2-3 is its ability to send printer setup strings with a minimum of fuss. Following are the steps to produce professional letter-quality output, complete with headers and footers, when printing a worksheet from 1-2-3 with the LaserJet. Without going into the gory details, you can't print graphics on the LaserJet from an IBM PC, although I believe you can with H-P's own computers.

Because the printer uses a serial port, you must add two lines to your AUTOEXEC.BAT file. The lines are:

```
MODE COM1:9600,N,8,1,P
```

```
MODE LPT1:=COM1
```

Then, from the 1-2-3 program, type /WGDP to select Worksheet, Global, Default, and Printer. To select the first serial port, type I28; to select the second, type I48.

Note that while you can type all the commands mentioned so far in either upper or lower case, they have different meanings in the print strings, so you must type these exactly as shown. First, type S027E<Enter> to reset the printer. Then set page length to 64 and top and bottom margins to 0 (the LaserJet leaves three blank lines at top and bottom of each page). Finally, set the right margin to a maximum of 78. You should then save your new configuration.

Users of this printer will also be interested in its ability to print sideways. I recommend leaving the setup string at 027E at all times and simply adding to this the appropriate strings for vertical or horizontal printing, referred to by H-P as Portrait Mode and Landscape Mode respectively.

Now for the setup strings for sideways printing; Hewlett-Packard has gone out of its way to make things difficult for us by using two sets of characters that are extremely hard to distinguish either on the screen or on hard copy. These sets are the lower-case l and the number 1, and the upper-case letter O and the number zero (0).

To change to Landscape mode, the string is 027E027&110.

To return to Portrait mode, the string is 027E027&100.

If you also have the optional font cartridge 92286A, guard it carefully, because they are hard to get (I had to get mine second-hand). This cartridge has the ability to print in compressed mode, 16.66 characters to the inch, which should allow you to print 176 columns to the page.

To select this mode, the setup string is 027E027&110027&k2S. To return to the default 10 characters per inch, the setup string is 027E027&110027&k0S.

I'll leave it to you to work out what margin settings to use and the setup strings for other possibilities. Because they're so difficult to type, I'd recommend you set them up as macros either in 1-2-3 or using a program such as ProKey.

The /Copy command

There is a shortcut to copying a long formula that you want to be absolute, but

have not entered with the \$ signs that turn it from a relative to an absolute reference. Edit the original formula to include a label prefix character, copy, and then edit both formulae to take out the label prefixes.

Here's a small example you might like to try out:

Go to cell F15.

Enter the formula +BI+DI.

COPY to cell A11.

The formula should now read +IS2045+IV2045. This happens because the formula has wrapped around to find an area located to the left of Column A and above Row 1.

The /Move command

When you MOVE data from a formatted cell or range, the format moves with the data. However, the original cells are no longer formatted unless you have been using a Global command.

If you MOVE an absolute formula that refers to a range, the formula will still refer to the same location.

/File Save and /File Retrieve

Don't use asterisks (*) in file names; typing /FSave* will erase all .wks files on the default data disk! Typing /FR* will retrieve the first .wks file in the directory.

/File Combine

If you globally protect a worksheet (/WGPE) you can still retrieve an entire file or a named range by the command File Combine Copy. If you /FCCopy an entire file, the combined information is protected. If you /FCCopy a named range, the combined information is not protected, and you must reprotect the worksheet if you want this new information protected.

/File Combine Copy works differently in Release 1 and Release 1A of 1-2-3. In Release 1, blank cells brought into the worksheet will write over any information previously entered in that cell. In Release 1A, blank cells do not alter the contents of existing cells.

Releases of 1-2-3

The only releases I am aware of are 1, 1A and 1A*. However, I understand that within these releases there may be some differences where Lotus has made changes to the copy protection. These changes should have no effect on how the program runs; they should cause you trouble only if you are trying (illegally) to defeat the copy protection scheme. □

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GLOSSARY

A

Accumulator: The major register of a CPU, in which arithmetic and logical functions are performed. Some computers have several registers which can function as accumulators; in others, some registers can perform a subset of the full set of operations.

Acoustic Coupler: A device for connecting the telephone handset to data communications equipment.

Address: A memory location which can contain data or an instruction.

AI: Artificial Intelligence.

Algol: Algorithmic Language. An early computer programming language for mathematical applications. Widely used in Europe, it embodied early structured programming concepts and was a precursor of Pascal.

Algorithm: A set of instructions which define a method of obtaining some result (usually mathematical). A cooking recipe is an algorithm, as is a knitting pattern.

Alphanumeric: Composed of letters or numbers or both.

Analogue (Analog): Representation of a value by a voltage or some other measurable datum, rather than a binary or other representation based on counting.

Application: What you do with your computer. For example games, word processing and graphics.

Array: A set of values under a common variable name, accessed through a subscript. For example A[1] is the first item in array A, A[2] is the second, and so on. A[N] is the Nth item.

ASCII: American Standard Code for Information Interchange; a common system for representing character information.

ASM: Assembler. Also a suffix added to assembly language file names under CP/M to distinguish them from other files with the same name.

Assembler: A program which converts assembly language into its corresponding machine (or object) code, which can be executed by the computer.

Assembly Language: A language in which each machine code instruction is represented by a short mnemonic which is much

more comprehensible to the programmer. For example, the 8080 machine code instruction: 10010110 is: SUBL(subtract contents of register L from accumulator) in assembly language. Each line of assembly language becomes one machine instruction.

Assign: To make one thing equal to another; for example, [AB] assigns the value of B to A.

Attribute: A property possessed by some object, such as a file being read-only.

B

Background Task: In a multi-programming environment, a low-priority program which runs when the processor has nothing else to do.

Backup: An extra copy of a disk, tape or file taken as a precaution against damage to the original.

Bandwidth: The range of frequencies that can be carried by a communications channel.

Base: The lowest number inexpressible as a single digit in a given number system.

BASIC: Beginners' All-purpose Symbolic Instruction Code. Invented in 1970 at Dartmouth College by Kemeny and Kurtz as a teaching language, it has since been enhanced in its more exotic forms into one of the most sophisticated yet easy-to-use languages available on personal computers. Its major rival is Pascal, which has the added virtue of stressing structured program design.

Baud: The number of bits transmitted per second along a data communications line.

BCD: Binary Coded Decimal, a 4-bit binary representation of the digits 0 through 9, with two BCD digits usually packed in a byte.

BDOS: Basic Disk Operating System. The major functional component of the CP/M DOS.

Binary: The base 2 system of counting used by digital computers.

Binary Search: A method of finding an entry in a table by successively halving the table until all that's left is the desired entry.

Binary Tree: A form of data structure in which entries are tagged on at the end of the appropriate branches.

BIOS: Basic Input/Output Sys-

tem. The part of the CP/M operating system which is different for each type of machine and provides any special I/O routines for disks, terminal, printer, and so on.

Bit: Binary digit, being the basic unit of data storage. Either 1 or 0, off or on, true or false.

Block: A physical division of data in a logical record.

Boot: To load the operating system into the computer from a disk or tape, either initially or subsequently after running a program.

Bootstrap: To use one short program to load a longer loader program which then loads the operating system.

Branch Instruction: A program instruction which causes the computer to jump to another instruction.

Buffer: An area of memory used for temporary storage while transferring data to or from a peripheral such as a printer or a disk drive.

Bug: An error in a program. Makes programmers itch.

Bus: A set of wires over which data, addresses, or control signals are transferred between the central processor and memory or I/O devices.

Byte: A computer word eight bits wide. A byte in memory can hold a character or a binary number between zero and 255 (or -128 and 127), or a computer instruction.

C

C: A programming language, developed at Bell Labs, which is particularly convenient for writing system utility programs.

Call: A jump to a subroutine which leaves the return address on the microprocessor stack so when the subroutine is finished executing control returns to where it left off.

CBASIC: A commercial version of the BASIC language, running under the CP/M operating system. Doesn't use line numbers on every line, and is compiled rather than interpreted like Microsoft BASIC.

CCITT: Consultative Committee on International Telegraphy and Telephony. The committee sets standards for various aspects of telephone and telegraph usage.

CCP: Console Command Proces-

sor. The part of the CP/M operating system that reads a command line and sorts out what it means.

Chain: To automatically run one program after another.

Character: A letter or number, or in some circumstances a control code such as 'carriage return'.

Checksum: A running total of the characters in a file, recorded or transmitted with the file so that errors can be detected.

COBOL: Common Business Oriented Language; a high-level language, mainly used in business applications.

Code:

Absolute Machine instructions which are intended to be loaded and executed in a particular area of memory.

Object Machine instructions, as distinct from the source code from which it was generated.

Re-entrant Code which may be called by more than one program at a time.

Relocatable Code which can be loaded and run anywhere in the computer's memory.

Source code: A program written in assembly language, or a high-level language such as BASIC, which must then be assembled or compiled to produce the object code which can actually be executed.

Cold Boot: To start up a system from scratch, loading the operating system from disk or tape.

Cold Start: See Cold Boot.

COM File: In CP/M parlance, a command file, that is, a machine code program that can actually be run.

Command: An instruction from the console for the system to do something.

Comment: A note added into a program to help the reader (or programmer) to understand its operation. Does not affect the program's execution in any way.

Compiler: A program which accepts as input a source file written in a high-level language, and produces as output an object file containing the machine instructions which are actually executed.

Concatenate: To join two strings together, one after the other.

Conditional: A test; for example, is X greater than Y:

IF X > Y THEN GOSUB 500 (BASIC)

GLOSSARY

Conditionals are one of the most powerful features of any computer language.

Configure: To organise the I/O or other aspects of a system.

Console: The keyboard and screen from which the operator controls the computer.

Control Characters: Codes which perform functions like acknowledging correct receipt of a message or requesting retransmission of an erroneous message. Control characters are defined as part of the ASCII and similar codes.

CP/M: A disk operating system for 8080- and Z80-based microcomputers. Allows the user to store information and programs in named files, as well as managing disk storage and input/output functions. Other disk operating systems include TRSDOS (on TRS-80), DOS 3.3 (for Apple) and MSDOS on many 16-bit micros.

CPS: Characters Per Second.

CPU: Central Processing Unit. The part of the computer responsible for fetching, decoding and performing instructions.

Crash: A situation where the system becomes inoperative, due to a hardware or software error.

CRT: Cathode Ray Tube. Usually refers to the screen of a video terminal.

D

Daisywheel Printer: A high-quality printer which has a print-head in the shape of a daisy.

Data: Information to be processed by, or output from, a program.

DBMS: Data Base Management System. A program which manages the systematic storage and retrieval of a centralised data pool.

DDT: Dynamic Debugging Tool. A program that assists the user to find errors in machine code programs.

Debug: To locate and fix errors.

Decimal: Based on ten.

Device: A piece of equipment such as a printer or tape drive which the computer uses.

Directory: A list of the programs on a disk (or occasionally tape) together with necessary information, such as length and location.

Disk: A flat, circular magnetic surface on which the computer can store and retrieve data and

programs. Is fast compared with tape, particularly when information is not stored sequentially.

Disk Drive: The mechanical assembly which rotates the disk and positions the read/write head.

DOS: Disk Operating System.

Disk Operating System: A program which operates one or more disk drives automatically and manages the system.

Display: The computer's output device at the console, usually a TV-like display of letters and numbers; sometimes the computer can produce graphics (charts and pictures) on the display.

Distributed System: A system in which information is stored in several computers; peripherals may be shared, but the information storage is decentralised.

Dot Matrix Printer: A printer which creates a text image from a cluster of dots; produces relatively low-quality, high-speed text and graphic output.

Double Density: A method of recording twice as much information on a floppy disk, requiring a higher-quality recording surface than on a single-density disk.

Driver: A program which controls input and output to a device.

E

EBCDIC: Extended Binary Coded Decimal Interchange Code; an 8-bit character coding system — IBM's answer to ASCII.

ED: An editor program; part of CP/M.

Editor: A program which lets you alter and correct source files and other documents.

Error Message: Tells you something went wrong, and sometimes what.

Execute: To run a program; to follow its instructions.

F

FIFO: First in, first out. A technique used in memory management procedures, or a device used in buffering data flow between two asynchronous devices operating at different speeds.

File: A continuous collection of characters (or bytes) saved on a disk or tape for later reloading.

Fixed Point: Counting in integers

only. Usually limited to small values, and restricted in accuracy, giving rise to ridiculous answers such as 9/5 1.

Flag: A variable, sometimes a single bit, which can have only two values and is used to indicate some condition.

Floating Point: The kind of arithmetic used in scientific calculators.

Floppy Disk: A disk, made of thin, flexible mylar, and enclosed in a card jacket, which can be used for magnetic storage. There are three varieties, 9 cm, 13 cm and 20 cm. These can typically store somewhere between 140,000 and three million bytes (characters).

Flowchart: Symbolic representation of the sequence of instructions in a program.

Focal: Formula Calculator. A simple language rather like a small BASIC, found on some mini and microcomputers.

FORTRAN: Formula Translator. One of the first computer languages, and beginning to show it, although still the king of the scientific or number crunching languages.

Function: A sub-program that processes variables in some well-defined way.

G

Garbage Collection: The process of going through memory or disk space, reclaiming all the redundant used space.

Gigabyte: One thousand megabytes (1,024,000,000 bytes).

Glitch: A pulse of electronic 'noise' which may cause a system failure.

Global: A variable which is known to all the parts of a program. See local.

H

Handshaking: A technique for controlling data communication between two devices; data flow only occurs when the receiving device sends a signal indicating it is ready to receive.

Hard Disk: A disk made of hard material, which is larger, faster and more fragile than a floppy disk, but capable of storing 70 million bytes or more.

Hard Copy: Printout.

Hardware: The bits of a com-

puter you can kick, as opposed to the programs you can only swear at.

Hashing: A method of reducing the size of a table which otherwise would have mostly empty entries.

Hexadecimal: The method of counting to the base sixteen or the method of splitting binary digits into groups of four, which is the same thing. In hex, you count: 0 1 2 3 4 5 6 7 8 9 A B C D E F 10 11 12 13 14 15 16 17 18 19 1A 1B 1C 1D 1E 1F 20 21 22.

I

IC: Integrated Circuit.

Identifier: A label, or the name of a variable.

Index: A variable which usually points to an entry in a table or list.

Index Register: A processor register which is used to access tables and lists in memory.

Indirect Addressing: Referring to a variable which actually contains the address of another variable.

Inkjet Printer: A device which prints by electrostatically aiming a jet of ink onto the paper.

Input: To get data into the computer.

Instruction: A step the computer can perform.

Instruction Set: The range of commands which can be performed by a particular processor.

Integer: A whole number.

Integrated Circuit: A circuit built on a single chip of silicon.

Interface: The (hardware or software) connection between any two devices.

Intermediate Code: A special kind of object code which cannot be run directly on the computer, but must be interpreted.

Interpreter: A program which examines source code a line at a time, decides what it means, and then does it. Compare with compiler.

Interrupt: To electronically drag the computer away from what it is doing in order to respond to some time-critical situation.

I/O: Input/Output.

I/O-bound: A process in which the performance speed is limited by the speed of input/output.

GLOSSARY

J
Jump Instruction: Normally, control proceeds from one instruction to the next, one after the other. A jump instruction passes control, not to the following instruction, but to some other. Jumps can be conditional.

K
Kilo-: Prefix meaning one thousand.
Kilobyte: 1024 bytes (Kbyte).
Kilobaud: 1000 baud (Kbaud).

L
Label: A word which identifies the destination of a call or jump instruction, or simply identifies some location in memory.
LAN: Local Area Network
Language: The set of instructions, and rules for stringing them together, which you use to instruct the computer what to do.
Laser Printer: A printer which works a bit like a photocopier, but uses a laser to draw an image directly onto the printing drum.
LCD: Liquid Crystal Display.
Library: A set of programs, or sub-programs, that can be called from your program so you don't have to waste space with a block of commonly used code; for example, a date routine can be held in a library.
LIFO: Last In, First Out. A device or data structure in which the most recent item stored is the first available for retrieval. A stack is a LIFO.

Line Number: A number at the beginning of a line, which identifies it in a similar way to a label.
Line Printer: A high-speed printer for computer output.
Link: Part of a data item in a list, which tells the computer the location of the next data item.
LISP: List Processor. A language much favoured by the artificial intelligence community.
List: A sequence of consecutive data items.
Load: To transfer some data or program into the computer memory.
Locate: To 'fix' a relocatable code so it will only run if loaded in a particular location.
Local Area Network: A system of

interconnected computers, within a limited geographical space (usually in a single building).

Logical Device: A device as the computer 'sees' it: what the computer regards as the 'list device' may be one of several 'physical devices', such as a line printer or teletype.

Loop: To repeatedly execute a sequence of instructions; part of a computer program that is so executed.

M
Machine Language: The binary codes the machine actually executes.

Macro: A user-defined sequence of instructions which can be inserted anywhere in a program. See Library.

Macro-assembler: An assembler which can utilise macros.

MBASIC: Microsoft BASIC, the BASIC used in the TRS-80, PET, Apple II and so on.

Megabyte: One thousand kilobytes — 1,024,000 bytes (Mbyte).

Memory: Where the computer stores data and programs internally for fast access.

Menu: A display which offers the operator a choice of alternatives.

Microcomputer: A small computer based on a microprocessor.

Micro-floppy: A 9 cm 'floppy' disk, produced with a rigid plastic case.

Microprocessor: The central processing unit of a computer, built into a single silicon chip.

Millisecond: One thousandth of a second

Mini-diskette: A 13 cm floppy disk.

MIPS: Million Instructions Per Second. A measure of processor speed.

Modem: Modulator/Demodulator. Device used to link a computer to the telephone line. It encodes digital bits into frequencies, and vice-versa.

MOS: Metal Oxide Semiconductor. Technology used for manufacturing high-density semiconductors. CMOS (complementary MOS) technology is characterised by low energy consumption, and is increasingly used in portable computers.

Mouse: A device connected to a computer which, when moved around on a desk, moves a pointer on the computer screen.

MP/M: A multi-user version of

CP/M.

Multiplexer: Device used to divide a communications line among a number of users.

N
Nanosecond: One billionth (0.00000001) of a second
Nibble: Half a byte (4 bits).

Node: A connection point on a network.

Network: A system of interconnected computers.

O
Object Code: Machine code.
Object File: A file containing object code.

Object Module: An object file containing part of a program, ready to be linked to others.

Octal: The system of counting to base eight, or grouping bits in threes.

Offset: To give the operating system the characteristics of a file so that it can subsequently read or write it.

Operand: The number an operator (+, -, and so on) operates on.

Operator: An arithmetic function or some other function which alters variables.

Optic Fibres: Cables made from thin fibres of glass (or similar material). Signals are encoded as light and transmitted along the cables.

Optimisation: Making a program work better (or faster, or using less memory).

Output: What the system produces.

Overlay: A technique for efficient use of memory space, in which different routines use the same memory locations. Routines using the same area are held in a backup store, and transferred into memory when needed.

P
Packed Data: Data which shares the same address, and has to be unpacked before use.

Packet Switching: A system of communicating data by dividing it into small packets addressed to particular receivers.

Page: A length of memory, typically 256 bytes.

Parallel Transmission: A method of moving data so that all elements of a compound unit are sent simultaneously. For exam-

ple, the eight bits in a byte may be sent at the same time by using eight channels. This is the method used within the computer, and with some printers. Fast and expensive.

Parameter: A constant which sometimes has to be varied.

Parity: An extra bit on the end of a character or byte for error detection.

Pascal: A modern structured language which may eventually rival BASIC in popularity for micro-computers.

Password: A secret word the system may demand of you before allowing you access to certain (or all) programs or data.

Patch: A temporary (ha, ha) fix on a bug.

Peripheral: A piece of equipment the computer uses, like a printer, disk drive, or modem.

Physical Device: See Logical Device.

Picosecond: One trillionth (0.00000000001) of a second.

PIP: Peripheral Interchange Program. A CP/M utility for copying files between devices.

PL/I: Programming Language One. A good general purpose commercial language.

Pointer: A variable used for indirect addressing.

Polish Notation: A method of separating operators and operands; for example, + 5 4 is Polish notation for 4 + 5.

Poll: To ask a peripheral if it requires service. For example, a processor will regularly check a terminal to see if it has output ready to be processed.

Port: A physical input/output connection point.

Postfix Notation: Also known as Reverse Polish Notation, this is similar to Polish; + 4 5 means 4 + 5.

Preprocessor: A program which does part of a job to make life easier for the program which follows; for example, a macro processor before an assembler.

Priority: The resolution of which interrupt is serviced first if two should arrive at the same time.

Process: A program.

Processor-bound: A process in which the limiting performance factor is the speed at which the processor can perform the required computations.

Program: A sequence of instructions which can be understood ▶

GLOSSARY

and ultimately followed by a computer.

Prompt: A message asking the operator or user to supply information.

Protocol: The rules governing the exchange of information between two devices.

Q

Queue: A list in which entries are made at one end, and removed from the other.

R

R/O: Read Only; cannot be overwritten.

RAM: Random Access Memory.
Random Access Memory: The computer's internal memory, which is used to hold running programs and data. The computer can write and read RAM.

ROM: Read Only Memory.
Read Only Memory: Internal computer memory used to store programs, which cannot be erased or overwritten.

Reader: Paper tape input device.
Read/Write Head: The small coil which reads and writes on the surface of a disk.

Real-time: A system in which the processing of data input to the computer takes place virtually simultaneously with the actions which generate the data.

Record: A set of related data items. For example, an employee's name, address, payroll number and pay rate.

Recursion: The ability of functions in some languages to call themselves.

Re-entrant Code: Code which can be used by several programs simultaneously, keeping separate data for each.

Register: A location in the processor capable of performing logical or arithmetic functions on the contents.

Relocatable: Capable of being moved in memory.

Relocatable Object Module: Part of a larger program consisting of many such modules, all tied together and located identically.

Permanent: Permanently in the memory.

Polish Notation: See Reverse Polish Notation.

Registered: Also RS232C. Registered feature RS232C. A widely used standard for connecting com-

ponents in a computer system.
Run: To execute a program.

S

SI00: A popular 100-line micro-computer bus, originally developed for the first 8080-based computer.

Save: To store a program on disk or cassette (particularly BASIC).

Screen: See CRT.

Sector: A section of data on a disk.
Serial Transmission: Movement of data one bit at a time. One byte will be sent as eight bits, one following the other. Cheap and slow.

Simulation: Making one system behave like another.

Software: Programs.

Source Code: The original text form of a program.

Source File: A file of source code.

Source Language: The language the source code is written in; for example, BASIC, Assembler, C.

Sort: To arrange items of data in order.

Spool: Simultaneous Peripheral Operations Online. A method of outputting information by queuing information for low-speed output devices, while simultaneously continuing other computer operations.

Stack: A list in which both entries and removals are made at the same end. A microprocessor usually has a hardware stack which is used to save subroutine return addresses, for temporary storage of data, and to pass variables between subroutines.

String: A sequence of characters.

Submit: To put the system under control of a file of system commands.

Subroutine: Part of a program which can be accessed from several points within the program.

Symbol: The name of a variable or a location in memory.

Symbol Table: A table constructed by an assembler or compiler to give the addresses of all variables and labels in a program.

System: A collection of hardware and software, possessed of the property that the whole is greater than the sum of the parts.

System Disk: A disk carrying the operating system.

T

Teletype: An electro-mechanical printer/keyboard.

Terabyte: One thousand giga bytes (1,024,000,000,000 bytes).

Timeshare: Running several programs on a system simultaneously.

Track: The area under the read/write head during one rotation of a disk.

Transient: A program that is only in memory for a short time before being overwritten. Often, the only program that is not a transient is the operating system.

Tree: A list in which each data item may refer to several others.

TTY: See Teletype.

U

UART: Universal Asynchronous Receiver/Transmitter. A device which handles the serial-to-parallel and parallel-to-serial conversion of bits in a data message.

Unix: A multi-user, multi-tasking, multi-programming operating system.

Utility: A program of use to most users.

V

Variable: Named quantity that can take on different values.

VDT: Video Display Terminal.

VDU: Video Display Unit.

Verify: To check that data written on a disk or tape can be read again correctly.

Viatel: Telecom Australia's videotext system.

Videotext: Also known as view-data. A technology which uses slightly modified domestic television sets to access data from a computer database along the telephone lines. Prestel in the UK was the first such system. Australia's version is called Viatel.

Virtual Memory: A technique allowing programs larger than RAM to run. Only part is in memory. Parts are swapped from an online storage device as required.

W

Warm Boot: To reload the operating system a second or subsequent time.

Window: A part of a computer screen which has been divided into sections for displaying distinct information. On some systems which run a number of processes at once, each concurrent process may be displayed in its own window.

Word: The amount of data fetched from one memory location. Typically one byte, but can be two on recent processors.

Word Processor: A system for manipulating, editing, printing and formatting text files.

WordStar: A proprietary word processing program.

Word Wrap: A word processing function which automatically breaks lines exceeding the set right margin limit, and begins placing the words on the next line.

Write Protect: To remove the cover from the notch in a 20 cm floppy disk, so it cannot be written on. With 13 cm mini-floppies, the reverse action (that is, covering the notch) will write-protect the disk.

Z

Z80: A popular 8-bit microprocessor.



LETTERS TO THE EDITOR

We are happy to receive your comments and, if they are of interest to other readers, publish them. Letters will only be considered for publication if they include your name and address, although we can withhold such details from publishing on request. Note that we reserve the right to (and probably will) edit all letters for the sake of brevity, clarity or accuracy.

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Contributions to *Your Computer* are welcomed and will be given every consideration*. Please read these notes carefully to get an idea of the style and format we prefer.

All Contributions: should include your name, address, and home and office phone

numbers (in case we need to check details). Each page of your submission, and any material sent with it, should also carry your name.

Contributions by Telephone: Contributors who have modems and suitable software (in the MODEM7/YAM mould - see our stories on Christensen Protocols in the May and June 1983 issues) can arrange direct transfer to our computers through our Bulletin Board system, which is on-line 24 hours a day, seven days a week. Contact our office by phone for details on transferring material in this way.

Contributions on Disk: Contributions can be accepted in a wide variety of disk formats, although some have to be converted outside our offices, which will add to the (often lengthy) delay between receipt and acknowledgement. The preferred medium is IBM standard format single-sided, single-density, 20 cm CP/M disks. We can also handle, in-office, Kaypro II and Osborne 13 cm disks, and 13 cm Apple DOS or Apple CP/M disks. Please pack them extremely carefully if posting and label all disks with your name, address and phone number.

Listings: Unless it is absolutely impossible, we want listings produced on the computer. This reduces the risk of error - if the computer typed it, the computer probably accepted it. Print listings with a dark - preferably new - ribbon on white paper, and try to format the output to a narrow (40-characters) width. If they can't be produced on a printer, borrow a good typewriter - hand-written material is likely to sit around the office for a year before someone can find time to type it all out for you! Please provide an account of what the program does, how it works and so on. Any comments on the program should refer to the address, line number or label rather than to a page number. Any comments on modifying the program to work on other machines will be appreciated. Try to include a printout of at least part of a sample run if possible.

Style: All items should be typed (or printed) and double-spaced on plain white paper. We will only accept original copies - no photostats. Include your name, address, telephone number and the date on the first page of your manuscript (all manuscript pages should have your surname and page number in the top right-hand corner). Be clear and concise, and keep jargon and adjectives to a minimum.

*Although the greatest care will be exercised with contributions, no responsibility can be accepted for the safety or return of any letters, manuscripts, photographs or other materials supplied to *Your Computer* magazine. If return is desired, you should include a stamped, self-addressed envelope. If return is critical - say it's something you can't afford to lose - then don't send it; we are careful, but we're not perfect. □

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YOUR computer

SILICON BRAINS

September's *Your Computer* will see us don our (plastic) thinking caps — we're going artificially intelligent. We'll ignore the people who say that's the only way we can show *any* smarts and present you with an analysis of *Artificial Intelligence Developments on Micros*. How do they make these dumb tin boxes — which can't even add two numbers together without detailed instructions — 'think' for themselves? Can they really make the right choice? Can they really *learn*?

There are a lot of people who think they can, and they're working hard to prove it. We'll look at their results so far — in the form of *working* software — in our overview of *Expert Systems in the Real World*. We'll look at some of the products already on the market, and give you the lowdown on what to expect in the future.

We'll look at *How to Write Your Own Expert System* in a feature by Tim Hartnell, Australian educator and author of several books dealing with the practical exploration of Artificial Intelligence (We've

avoided calling it AI since we received a letter from a farmer pointing out computers can't have calves). Tim's feature includes a listing for an Expert System in BASIC, with guidelines on how to develop it further.

September will cover some of the useful 'fringe' areas of Artificial Intelligence — for example, Human Edge Software's series which analyses prospective customers (or employees, business associates and so on) based on your opinions of them. It's not really an Expert System, but it gives a hint of things to come.

We'll also continue our Computing On The Cheap theme from this issue — we never can fit in everything we want to give you each month! We'll have part three of *Software on the Cheap*, covering packages between \$50 and \$100, and a review of Toshiba's MSX machine, the HX10.

JAZZY NEW PRODUCTS

Reviews planned for September include Lotus Corporation's jazz, the integrated package for Apple's Macintosh — after being pre-released, pre-released, previewed and promised for a long time, it's finally here. We have a copy in our hot little hands (we usually won't talk about a product until we do have it) but whether it makes the September deadline will depend on how heavily we can exercise it in the time available.

Other reviews should include the new Commodore 128 and Toshiba's amazing 1100 — a briefcase portable with full-size LCD screen and built-in microfloppy like the DG-One (but at a mere \$2900), it even runs Flight Simulator on the standard display.

Then there's Programmer's Workbench and Bit Bucket, with half a dozen mini-reviews of products like the NDK Printstar, Commodore's PC10, Flashprint, Diskwasher and more; the Great Database

Search, Breeze Retail Software (Les says shop owners who don't take a look at it have rocks in their head); and the latest version of the Norton Utilities.

You'll get a chance to test your computing knowledge in September with our *Trivia Quiz* — and win a copy of Charlie's Cashbook, an accounting program for the IBM PC, just by guessing which question we've given the wrong answer for.

Still haven't had enough? Well, you'll also get *Pocket Programs* (including Supermail, a mailing list manager which creates Mailmerge-compatible files and produces mailing labels, envelopes and personalised bulk mail); a look at the fascinating future in store for the electronic secretary (as it exists *today* for the lucky few); and tutorials on *Structured Programming* and *Using PCs in Marketing*.

ADVANCE WARNING

After September comes our Do-It-Yourself issue, October, where you can learn how to install an aftermarket hard disk in your IBM PC, make your own RS232 cables (saving \$50 or more at a time), and write your own C programs — Les has written a new tutorial series, and it's just the thing for all those people who want to learn this powerful and increasingly popular language.

There'll be more to do yourself, of course — they just happen to be the three features we've already prepared. Any distributors with products or services should let us know about them now.

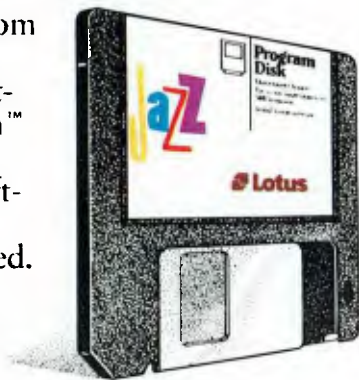
Further into the future we have our Christmas Buyers' Guide and features on Supermicros and comparisons of multi-user systems.

We need to repeat our disclaimer here: remember, what we tell you on this page is what we are planning for future issues, but for a whole lot of reasons we can't guarantee it will happen exactly as we say. This column should be taken as a guide to upcoming features, not a promise.

For example, we said here last month that this issue would carry the YC annual index. There just wasn't room. Now we've decided not to print the index at all — but we *will* be putting it up on the *Your Computer* bulletin board, and we'll have it available in printed form as well. If you want a copy, just write to us.

We're going to Jazz™ up your business!

Introducing Jazz™ from Lotus®, the first multi-functional business software for the Macintosh™ 512K. Jazz could quite possibly be the only software you and your Macintosh will ever need. Jazz offers worksheet, graphics, word processing, database and communications. Perform each function independently, or combine functions as you need them.



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Microsoft draws your attention to a word most word processing software doesn't want to know about.

To AVOID TENOSYNOVITIS, you might begin by avoiding technology.

But that's a little like avoiding food poisoning by avoiding food.

Technology, like food, is here to stay. The benefits tend to outweigh the problems.

Word processing is a good example: It has made the typewriter obsolete to virtually all who work with words.

But conventional word processing software has a major weakness: It sentences the fingers and tendons to hard labour at the keyboard.

Without relief.

(The old manual typewriter offered the fingers escape from the keyboard via the carriage return.)

Many argue that this unnatural repetition encourages tenosynovitis ... Repetition Strain Injury.

Announcing a dedicated word processing programme not dedicated to repetition.

Microsoft WORD offers, uniquely, *the option of the Microsoft Mouse*. We do not claim, mind you, that the Microsoft Mouse prevents Repetition Strain Injury.

Merely (and clearly) that it provides relief from repetition.

Our Mouse lets your fingers escape from the keyboard.

Added to which, it simplifies a whole range of previously tedious, time consuming and complex word processing tasks.

So much so, that there's one form of strain

it definitely relieves:

Brain strain.

Microsoft Word makes your IBM an Indispensable Business Machine.

If you work with an IBM PC (or compatible) you can access the new Microsoft WORD 2.0.

And you can access - from day one - its powerful and advanced features. Thanks to the Mouse.

The no-skills-needed Mouse lets you seek, select, edit and format text with the flick of a wrist.

And without touching the keyboard.

(You always have the option, of course, of operating WORD sans Mouse and with far fewer keystrokes and much greater speed than a conventional word processor. But why be a martyr?)

Extraordinary features you can put your finger on.

With WORD your formatted document is there on the screen - complete with **boldface**, underline, *italics*, superscript and subscript.

You can *scroll* through text, open multiple windows (and work with up to eight documents at once), cut and paste within or between documents, file frequently used phrases in the Glossary, create style sheets and customise your own character and paragraph formats (or use immediately your choice of several pre-designed style sheets), set tabs (centred, decimal, left and

right), key-in footnotes (same page or end of document), print text in columns (newspaper style), and get Microsoft Spell - built into new WORD 2.0 - to check for literals.

You can even add your own names and technical terms, say, to Spell's 80,000 word English (not American) Dictionary.

There's much more.

And to ensure you efficiently explore all the possibilities, we provide a computer-assisted disk that makes learning easy.

New Microsoft WORD 2.0.

It's technology working for you. Rather than you working for technology.

For more information, call now on Sydney 922 5088 or toll-free (008) 226 850. Or write to us at Microsoft Pty Ltd, Freepost 3, Forestville, NSW 2087.

MICROSOFT



Tenosynovitis