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SEPTEMBER 1984 MAGAZINE FOR BUSINESS AND PLEASURE

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—for business and fun



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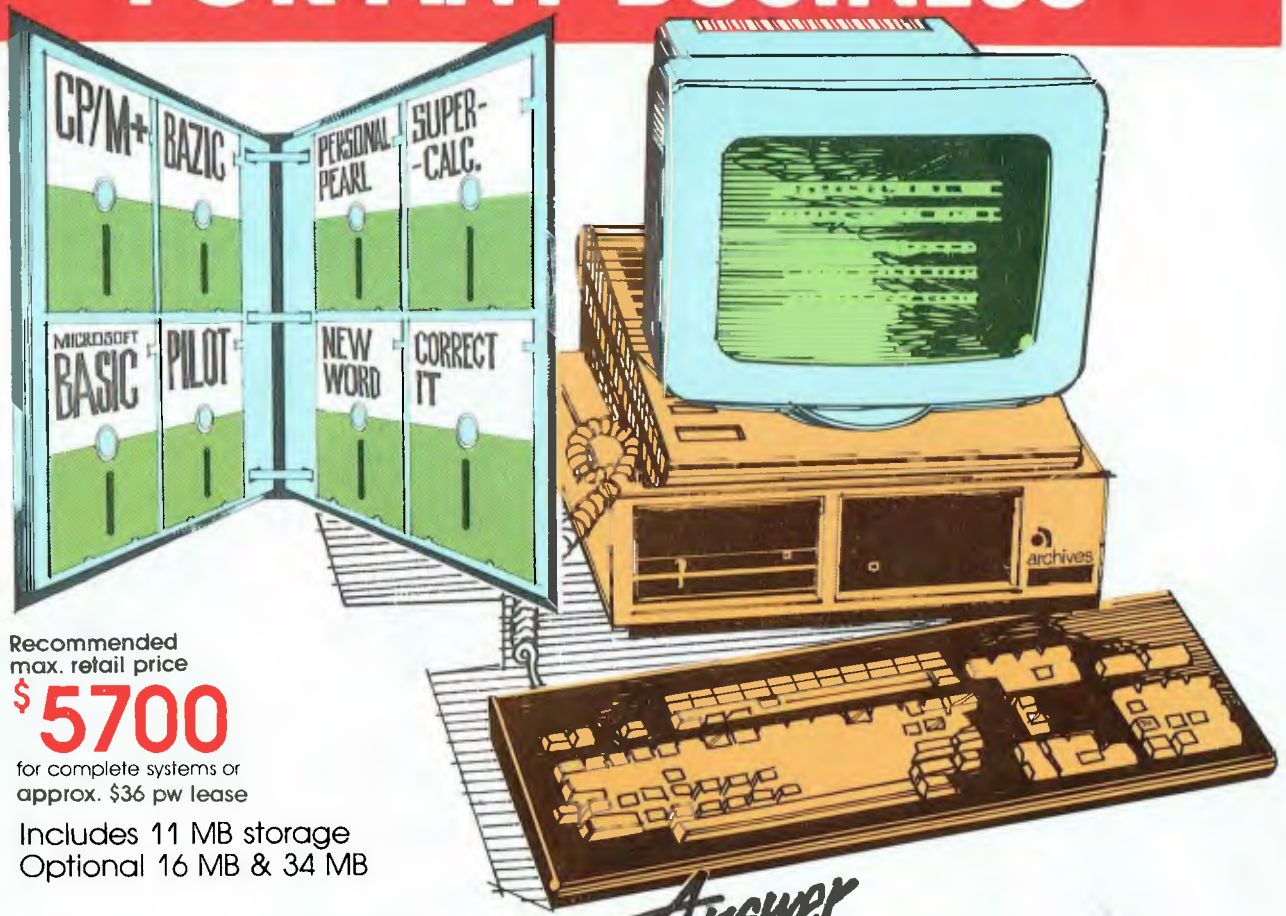
Courseware reviews • Apples aid Aborigines



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GREAT AUSSIE SOFTWARE COMPETITION

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The fact that the best one will also offer a free 3-month warranty plus, for a token amount for registered users, an additional 9-month warranty, and the maintenance back-up of Sigma Data that enables on-site care is quite unique.

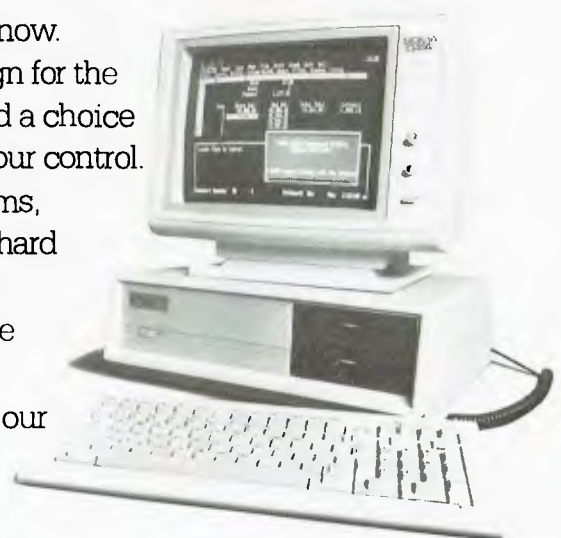
Most of the remaining roses are looking very tired now.

The best one will also offer a more functional design for the users' ease. A footprint that takes up less desk space. And a choice of screens that tilt and swivel with push-button mono/colour control.

The best one will offer a choice of operating systems, including the latest Concurrent CP/M-DOS[†], an optional hard disk model, and an extensive range of business software.

If you could find two roses offering all this, then the best one would be the least expensive.

And that's the Elite from Sigma Data. To compare our rose with the rest of the garden, phone Sigma Data, Sydney on (02) 439 6211.





The Biggest Aspidistra in the World?

One liability of having to write editorials is the awesome responsibility of being controversial each month. As my articles gradually get done and the deadline draws closer, I feel the need to get angry about something. But this month, it seems that all is well with the world, and I can't quite raise the adrenalin to be controversial. So I'll just have to be nice to everyone for a change!

One thing did catch my eye recently that not so much angered as puzzled me. It's not really related to microcomputers, but it is about computers, and Australia's ratings in the technology stakes, so it fits within the purview of this column.

It seems the scientific johnnies at CSIRO have got themselves a new computer, a Cyber 205 or whatever. Anyway, it's the biggest supercomputer in the southern hemisphere.

And I'm very glad we have it. This makes Australia a force to be reckoned with — Mrs Thatcher would be proud of us. If we'd bought the second-biggest supercomputer in the southern hemisphere that might have meant bowing to Argentinian supremacy in number-crunching. But with one clear stroke, Australia has leapt to international (well, hemispherical) domination of the field of supercomputing.

What puzzles me, though, is what we are going to do with it. Evidently, it puzzles the minds at CSIRO as well. For last month, in the computing press, and even in the daily press, I saw a series of advertisements calling for expressions of interest from organisations who might have suitable projects for the new toy at CSIRO.

I mean, if they didn't really need it, and don't actually have a use for it, why buy it? I could have lent them a computer if they were caught short.

It rather smacks of megalomania, as though someone in CSIRO personally wanted the biggest toy on the block — only now he's being forced to share it.

But there are serious undertones here. In any commercial organisation, the purchase of new hardware is delayed until the last minute, until it's impossible to do without it. Yet here we have a government organisation which has got so much computer capacity it literally doesn't know what to do with it.

Whatever happened to the spirit of the razor gang? If the Public Accounts Committee starts looking into this little escapade, who knows what it might find?

If CSIRO is still stuck for something to occupy its hardware, perhaps we could use it to train the national team for the World Space Invader Championships. It's better than nothing.

Who said the difference between men and boys is the price of their toys?

Les Bell

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Nashua

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ROLAND DXY-800 PLOTTER

22

As business people find graphs more and more helpful in aiding comprehension of complicated financial and statistical data, so the need for good-quality, affordable plotters to produce the hard copy has emerged. The Roland DXY-800 eight-pen plotter provides both the required quality and value for money.

LES BELL

VIVA LAS VEGAS!

92

Frank Lee braved the blistering heat of Las Vegas to attend the annual US National Computer Conference this July. His report gives an idea of the new models and innovations we can expect to see in the computing world in the next few months.

FRANK LEE

PROGRAMMER'S WORKBENCH

113

In his jaunts about the Australian computer world, Les Bell picks up all sorts of useful information that doesn't fit handily into an article, but which is of interest to anyone concerned with computers. In this new occasional series he gets it all together on paper in a pot-pourri of odds and ends of data.

LES BELL

SPECIALS

POCKET PROGRAMS

81

More programs from readers covering everything from games to business applications.

THE GREAT AUSSIE SOFTWARE COMPETITION

134

This is your last chance to enter this competition and have the chance of winning a Labtam computer and peripherals worth over \$14,000!

YOUR COMPUTER DIARY

144

Starting this issue, we'll be bringing you a list of events in the computing world for the coming month, to help you plan your agenda and avoid missing out on happenings right around the country.

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YOUR COMPUTER WIPED OUT!

129

*One momentous day, two men descended on the **Your Computer** offices and wiped us clean! ... All our dirty terminals and printers came out sparkling and pristine. What do you know about the importance of computer cleaning and maintenance?*

EVAN McHUGH

REVIEWS

TURBO PASCAL

107

As you'd expect from its name, 'Turbo Pascal' is a fast new compiler that in effect supplies you with a complete Pascal development environment.

DAVID MORE

BOBCAT

122

This file directory program is designed to keep track of CP/M files and disks — invaluable if you can never remember exactly where you wrote that WordStar program last week, or what you called it!

MARIA LENGAS

MBASIC HANDBOOK

124

Some time back, several readers asked if we knew of a good book about MBASIC; here's one for your collection.

MIKE MURRAY

BC BASIC

130

This new BASIC is said to enhance the capabilities of a Commodore 64.

ANDREW FARRELL

TUTORIAL

GETTING DBEST FROM DBASE, PART X 100

This month our Les looks at editing and string handling.

LES BELL

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Audited by
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to March 31 1984

AVERAGE NET PAID SALES
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THE GREAT DATABASE SEARCH: FIRST REVIEWS

DATAFLEX

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MATT WHELAN

KNOWLEDGEMAN

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ROSE VINES

Both these database management programs contain features on every dBase II user's 'wish list'; could either be the winner of the 'Great Database Search'?

COMPETITION — WIN A DATABASE PROGRAM!

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COMPUTERS IN EDUCATION

TEACHERS: MUST THEY BE COMPUTER-ILLITERATE?

51

There's a lot of talk about the impact of technology on teaching, but nothing much seems to get done. Will Australian education just keep slipping further and further behind when it comes to computers?

PROF. A. H. WILLIS

BREACHING CULTURAL BARRIERS

57

A school in the Northern Territory which has a largely Aboriginal student population has found its Apple computers a phenomenal aid in breaking down the barriers that often exist between Aboriginal culture and western-style education.

CLOSE-UP ON THE ACTION

60

Last month we printed a summary of what each of the Australian states is doing in the field of computer education. This issue we look more closely at a few education groups in various states, both government-run and privately organised.

NATALIE FILATOFF

MORE COURSEWARE REVIEWED

68

The rush of educational software pouring into our office for review hasn't abated since last month; the response to our education feature has been so great that we're planning a separate book on the subject! In this issue you'll find reviews of another dozen or so pieces of courseware.

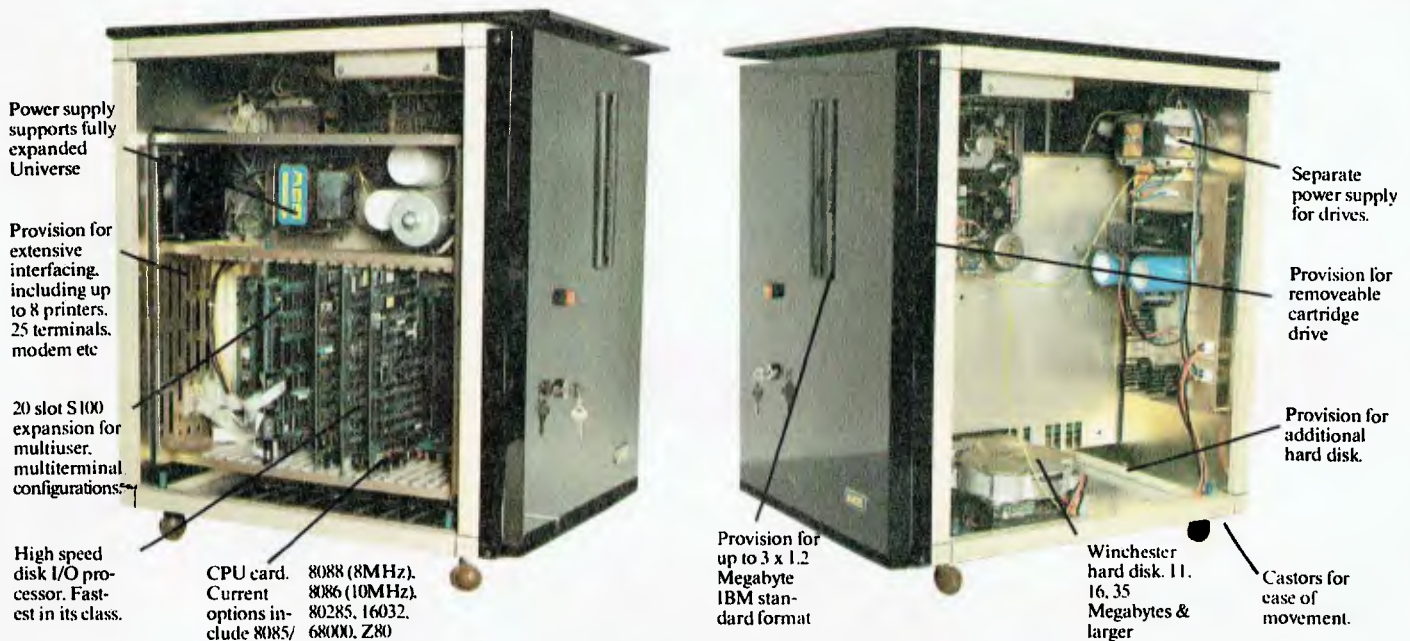


NEXT MONTH

Communications is probably the fastest-growing area of computing, with potential to expand the availability of information over the whole globe at the press of a few keys. In our October issue we'll be looking at all aspects of communications, from modems and local area networks to Midas, Minerva and talking to the world.

In *Your Business Computer* there's a comprehensive feature on terminals: what they are, different kinds of terminal, what they do and so on. Any business person who's ever wondered if the salesman is talking about him when the words 'smart' and 'dumb' come up shouldn't miss this issue!

Starts small, thinks big



Universe is the right computer for large *and* small businesses. Totally modular design means it's right for your needs *this* year yet able to grow inexpensively *next* year.

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than you need right now. As new developments come along they are available *first* on Universe and they plug straight in.

2. If there is a program dead right for your business there is more chance it runs on a Universe. You have access to over 75% of available application software. Most PCs give you access to less than one third of this software.

3. Universe can expand to help your whole business. Adding extra workstations is fast and easy. A few PCs offer 'networking' where several small computers share the data storage. This arrangement is *unworkably slow* in the majority of business

applications. Universe provides the right solution. Our Multiuser system gives everybody fast access to information.

4. Universe lets you do several things at once. Other computers only let you do one thing at a time. Swapping between programs is slow. Using our unique MPS (Multiple program facility), Universe lets you move between any 10 programs almost instantly - an incredible time saver.

5. Universe gets its work done faster. On industry standard sorting tasks (which relate to many tasks you will probably use the computer for) Universe runs 3 times faster than an IBM PC and twice the speed of and NEC APC.

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Aztec-C11
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C-Basic
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Basic Interpreter
Cobol Compiler
Access Manager
Animator for Cobol
Fortran 77
C-Basic 86

DATA MANAGEMENT

Friday
Rescue
FMS-80
Data Minder
Datastar
Dbase II
Dbase II (report writer)
Quickecode
Condor
Knowledgeman
Mdbs III
Infostar
Dataflex
Delta

COMMUNICATIONS

BSTAM
BSTMS
Hite
Term 2
YAM
XMODEM
XYAM

WORD PROCESSING

Wordstar
Spellstar
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Star Index
Spellguard
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DEVELOPMENT

Wordmaster
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Canberra: 217 Northbourne Ave., Canberra ACT (062) 47 3403

W.A.: AED WA, Computer Services of WA (09) 450 5888

Changes at Commodore

A NEW COMPANY structure, a few new computers, a business boost for the Commodore 64, talking machines, a daisywheel printer and a touch of magic – Commodore really took the lid off the popcorn at the Melbourne PC show in July, launching a major offensive into the business market, while also giving the hobbyist something fresh to think about.

Having been in business in Australia for four years, and having sold over 200,000 computers during that time, Commodore has established a corporate structure to support increasing sales in Australia.

Said Managing Director Nigel Shepherd, "We have been too busy in the past trying to maintain our supplies into Australia to be over-concerned with the company structure, but the time has come to formalise our structure."

With its house in order, Commodore released the three new computers we've all heard something about from one source or another: the Commodore 8296-D and Plus/4 business computers, and the Commodore 16, described as 'Vic's brother'.

The **Commodore 8296-D** has dual 13 cm disk drives (1.06 Mbytes each) built into the Porsche-designed(!) cabinet; 128K of memory; an 80-column display; the full range of Commodore graphics and alphanumeric set; a tilting, swivelling screen and a detachable keyboard. It takes five milliseconds for the disk drive to access from track to track, and up to 224 files can be stored on each of the disks. The company also says it has an extensive range of software for the machine.

The **Commodore Plus/4** is so named for the four application programs – word processing, file management, spreadsheet and graphics – in its read-only memory. These packages can share and exchange information, and the Plus/4 also has a split-screen function which allows viewing of two packages simultaneously. The machine has 60K of RAM, a 'help' key, and an advanced version of BASIC. It will operate in conjunction with many Commodore 64 and VIC-20 peripherals, and has a recommended retail price of around \$599. While aimed initially at the smaller business market, the Plus/4 is also expected to appeal to home computer buffs.

Managing Director Nigel Shepherd describes the **Commodore 16** as an alternative computer to the VIC-20, in the popular \$200 price bracket. The VIC-20 will not be discontinued, or discounted.

The Commodore 16 is not fully compatible with the VIC-20 or the Commodore 64 in terms of software, but was conceptualised rather as a completely new machine supposedly sporting features normally found on computers in higher price brackets. It has an advanced BASIC programming language with more than 75 programming commands, including full graphics plotting and program editing; a 'help' key which activates searches for syntax errors in programs; 16K of RAM, with 12K available for BASIC programs; comprehensive manuals written in the form of a training course; and the ability to be linked to Commodore peripherals.

The **Commodore 64** has not been neglected in the distribution of new products. It has been encouraged to try harder for the custom of small business people, with a new range of business applications software.

This range, marketed under the umbrella title of Meridian



The Commodore 8296-D computer, flanked by printer, slimline disk drive and 8296 model.



Commodore's 1101 daisywheel printer.

The new Commodore Plus/4 micro with four applications built into its ROM.



The Commodore 16 computer.

Software, includes programs which help small business people handle their debtors, undertake sales analysis and carry out invoicing, maintain creditors listings, keep a general ledger and undertake detailed stock control. To start a Commodore 64 business system would cost around \$2200, which includes a 64, a Commodore disk drive, a Commodore dot matrix printer, a colour monitor and two Meridian programs.

Also new from Commodore are **Magic Voice**, a speech synthesiser with 234-word built-in vocabulary for the 64; **Magic Desk**, which allows you to make the Commodore 64 perform various functions using a joystick-controlled pointer on the screen (\$64 on cartridge); and a new daisywheel printer called the **DPS 1101**.

For more information, contact your local Commodore dealer, or Commodore Business Machines, 5 Orion Road, Lane Cove 2066; phone (02) 427 4888. □

1-2-3 Adds 4 and 5

ON A wet Thursday at the end of July, Imagineering released Symphony, Lotus's upgrade to Lotus 1-2-3, with great fanfare at the Sydney Opera House. Imagineering is Lotus's main distributor in Australia, and was concerned to promote both the new product and Lotus's image as a dynamic young company whose first concern is the consumer's needs.

The product is touted as the best thing for general office needs since the invention of the silicon chip, and it was presented with plenty of razzamatazz, including a video clip of an office full of Americans breaking into dance when they discover Lotus 1-2-3, and another of various Lotus key employees extolling the virtues of the company (quite credibly, all things considered!).

Symphony itself contains five interactive modules: word processing, spreadsheet, database manager, graphics and communications. The word processor in particular is a great step forward from the original Lotus package, as it enables reports and analyses to be attached to spreadsheets and graphs without changing programs.

As well as the five interactive applications, Symphony makes use of windowing, enabling the user at all times to see exactly what is happening in other modules as a result of whatever he or she is doing at the time.

Each individual application program is said to be "full-featured", so that users would have to have very special needs before they'd have to turn to, for example, a dedicated word processor rather

than Symphony's version. The communications package in particular enables access to other computers within or outside the company, making a huge amount of information potentially available to Symphony users.

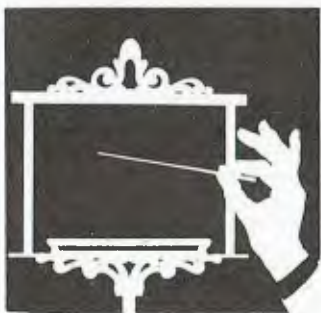
Symphony comes with three manuals both to help the user start up and to answer later, more involved questions, and dealers will also have available a range of material to help train Symphonists.

At present Symphony is available for the IBM-PC and compatibles such as the Compaq computer, but Lotus plans to release the package for other computers within the next few months. You'll need MS-DOS version 2.0 or later, a minimum of 320K RAM and one DSDD disk drive; additional RAM and a second drive can be used if available, and Symphony will run on a variety of monitors and other peripherals.

Great news for Lotus users who would like to upgrade to Symphony is Imagineering's exchange program, which started on August 1 and will run until September 30 this year. All a Lotus user has to do is return his/her Lotus disks and manuals to their dealer, and they will receive a complete Symphony package for only \$300, the difference in price between the two programs.

Imagineering has also started up a 'Hotline' help service for Lotus 1-2-3 and Symphony users, giving them direct access to prompt and educated answers to all kinds of questions. Adrienne Erwin and Mike Jones will be managing the Hotline, and will be able to give advice on upgrades, peripherals and compatible machines as well as answering both general and technical questions. The number for the Hotline is (02) 211-4462.

Your Computer published a preview of Symphony in our August issue, giving more detail about all of its capabilities, and you can be sure we'll be printing a comprehensive review of the package just as soon as we can get our hands on a copy (judging by the value of orders Imagineering claims to be taking for it, it could be in as short supply as emeralds for a while!).



ALL THE WAY FROM THE USA ...

COMMODORE 64 BASIC PROGRAMS

Timothy Orr Knight and Darren La Batt

This comprehensive guide gives the Commodore 64 user 30 ready to run programs in the following areas of interest – education, games, graphics, personal, sound and utilities. A sample run of each program is shown, explaining each program by line numbers, listing important variables and providing suggested program modifications.
rrp \$13.95.

THE TOOL KIT SERIES – COMMODORE 64 EDITION

Ted Buchholz and Dave Dusthimer

To become computer literate and to keep your Commodore 64 in functioning order, you must have the correct tools. The 'tools' in this book are short 5-to-15 line subroutines that combine colour, sound and music, graphics and animation to form a variety of educational programs and computer games.
rrp \$13.95.

INTRODUCING THE APPLE IIc

Philip Lieberman

This is an introductory guide to the Apple IIc – the complete, compact, low cost/high capability computer for the home or office that enables you to use the vast assortment of existing Apple II software.

Subjects covered include compatibility with other Apples and the new features of the Apple IIc, setting up and expanding your system – hardware and software and using built-in Applesoft – writing programs, using graphics and desk storage.
rrp \$25.95.

SAMS
The Tool Kit Series
Commodore 64 Edition



SAMS
Introducing the
Apple IIc
Philip Lieberman



SAMS
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NEWS



Arcom Pacific, the Brisbane company distributing the new Framework interactive software and dBase III, is known to us already as having rather more than its fair share of eccentrics working for it; our very own CP/M writer Bill Bolton, for example, is one of them.

When Arcom unveiled Framework at the Melbourne PC 84 show, then, we weren't too surprised to discover that the release wasn't quite in the usual staid style. In fact, Arcom hired the old Melbourne Gaol for the occasion, put on a show reminiscent of the music halls (see photos), and sent round 'Wanted' posters of members of the company instead of invitations, in which they were accused of 'pushing' products in an 'International Framework Syndicate'.

Of these products it was said: "It is known that they are soft and have caused euphoria in businessmen. Some are quoted as saying: 'It was mind-blowing. In outline it was fantastic. In depth, unreal, the colours, the words, the relationships'."

If you want to know more about the actual products - Framework and dBase III - you'll have to risk your sanity and contact Arcom Pacific on (07) 52-3862.



Quorum. A cologne for the other man lurking inside you.

Eau de toilette,
spray cologne,
after shave.





Qantem Audio's duplication plant for cassette-based software.

On Cassette ...

DATA copying is usually not a problem with diskettes, but the cassette copying world is full of bad copies. High-speed copying devices can copy in seconds but often lose data in the process. For commercial suppliers of cassette-based software such errors are unacceptable.

One company considers there is a niche in the marketplace for a company supplying high-quality cassette copying services. Qantem Audio has built up a new duplication plant

consisting of a large bank of modified cassette decks fitted with special heads and running at standard cassette speed.

All computer recording levels and electronics can be accounted for, right up to the new fast-loading system for Commodores. Any size of production run can be handled, from small to very large.

For more information contact Qantem Audio, 38B Scotsburn Avenue, South Oakleigh 3167; phone (03) 544 7301. □

Do You Copy?

A DISK-copying service is being offered by the Automated Office for fast, inexpensive transfer of disks from one computer format to another.

Over 90 disk formats for CP/M 13 cm and 20 cm disks, the four IBM PC-DOS formats.

Sirius, Vector Graphic and ICL formats are supported.

A typical transfer costs only \$9 if the disk is supplied. For more information contact Deborah Morton at the Automated Office, PO Box 490, Chatswood 2067; phone (02) 411 1892. □

FILE TRANSFERS

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- IBM 3740 datasets, DEC RX01
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TETRAD SYSTEMS

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Disk Doubling

IF YOU are one of those computer owners who are continually chopping holes in double-sided disks so you can use both sides in your single-sided disk drives, then here is a product for you.

The Disk Doubler, from a Queensland company of the same name, will chop the right-sized hole in just the right spot on your diskette, allowing you to use both sides with a minimum of hassle.

The Disk Doubler will sell for around \$20 and should pay for itself with a couple of boxes of diskettes.

For those of you who do not know the scam with single-sided diskettes, it works like this. A box of single-sided diskettes might cost around \$32, and double-sided diskettes around \$41. So if you buy double-sided diskettes and flip the

diskette over to use both sides it cost you \$9 per box more, but you get twice the memory. By buying one box of double sided diskettes instead of two boxes of single-sided diskettes you save \$23.

However, people have been creating their own double-sided diskettes out of single-sided ones for years, despite howls of warning from disk companies and computer manufacturers alike. You just have to cut a little read-write notch and you are in business. What the disk doubler does is cut the little notch for you in exactly the right place and at just the right size — and hey presto, you've saved even more money.

For more information contact Disk Doubler, PO Box 372, Southport 4215; phone (075) 32 0254. □



Part of Centre Industries' workshop at Allambie Heights, in which handicapped and non-disabled people work side by side.

Disabled in Computing

CENTRE Industries, a division of the Spastic Centre of New South Wales, has landed a contract with Datapoint for the manufacture of a sophisticated telephone system.

The contract is initially for 600 printed circuit boards for Datapoint's Automatic Call Distributor (ACD). They will be assembled at Centre Industries' Allambie Heights workshop.

Centre Industries employs 700 people, of whom about 300 have cerebral palsy. The company's philosophy is to employ as many handicapped people as possible in as many aspects of the manufacturing process as

possible. The handicapped staff work side by side with non-disabled people in the manufacturing process, performing the less difficult tasks where a high level of co-ordination is not involved.

Much of Centre Industries' work comes from Telecom, but an increasing number of companies is cashing in on some highly competitive prices. Centre Industries exists not only as a workshop for the disabled but also as a profit-making organisation. It has some of the most sophisticated manufacturing equipment of its kind in Australia, including wave soldering and trimming equipment. □

PORTA PAK COMPUTER

...other computers cringe

PortaPak comes with its sleeves rolled up. It was designed in Australia to get the most work done in the least time and at the lowest price.

If you want results, sheer computing power, trouble free performance, then PortaPak is the only choice. If you want prestige, if you need to stroke your corporate ego, we suggest you buy something else. Something that costs more, isn't as powerful but has a lot of "image."

Put PortaPak up against imported machines costing \$5000, \$6000 even \$7000. The other machines cringe with embarrassment.

PortaPak has 800K of formatted space on each disk drive. The expensive machines which boast about having 360K suddenly look rather silly. With PortaPak you'll be able to handle much bigger data files and have far more programs on hand without having to fiddle around changing disks.

Reliability is often thought of in terms of machine breakdowns. Nowadays, the big problem isn't with breakdowns it's with hangups - when your machine turns out to be incompatible with your software. This is an enormous, widespread problem.

It's why we teamed up with Australia's software geniuses - Software Source Pty Ltd, the top suppliers of business and professional programs in the country. First, they specially customized PortaPak's operating system so it works with exceptional speed and simplicity.

Then they customized all their CP/M products to run perfectly on the PortaPak - products like dBASE II, SuperCalc, all the major languages, accounting

systems, etc. Most importantly, they stake their reputation that all these products will work without hitches. No other computer in Australia can offer this total software support.

As for electrical and mechanical reliability, look inside a PortaPak. There's a striking difference. The PortaPak is completely modular. We didn't scrimp by putting all the circuits on one board. We use *three*. Servicing is simpler, quicker and cheaper. It's why the leading national computer service company, TCG Pty Ltd, is pleased to offer a 12 month service contract on PortaPak in all capital cities.

Take an extra close look at the Canon disk drives. If Rolls-Royce built computers, they'd use Canon drives. See the massive head protection shield? Hear the way the heads lock away every time they deselect? The designers had an unusual attitude to reliability - fanatical.

Now carry out some speed tests. On a standard benchmark test using BASIC routines*, the timings are: PortaPak 12.9 seconds, IBM PC 16.4 seconds, NEC APC 19.7 seconds and Sirius 16.4 seconds. Using a standard dBASE II routine**, the timings are: PortaPak 8 minutes 11 seconds, IBM PC 11m 52s, Sirius 17m 9s and NEC APC 19m 16s.

The expensive imports really cringe at this because they make so much of being "16-bit" machines. PortaPak is an 8-bit machine and proud of it. Not only is an 8-bit machine inherently better suited to jobs like word processing, accounting, spreadsheets, etc, but the 6MHz clock rate ensures it can run rings around the others even in complicated mathematical tasks.

Now to really rub it in, look at PortaPak's stunning additional features:

- Compact portability. It needs only half the desk space of its nearest rival. It goes with you on business trips, at night, on the weekend. *In one hand, you hold the concentrated working power of an entire office.*
- 9-inch screen, 80-characters wide but with 35 lines instead of 24. You see more of your work and the characters are the normal shape - not elongated. Much more readable.
- 640 x 304 high resolution, dot addressable graphics.
- Free software including Spellbinder word processing and office management system (the most powerful available), EBASIC compiler, MENU to make life easy for new users, MODEM for telephone communications, and Speed Print which lets you continue working while you're printing.
- Universal terminal emulation lets your PortaPak mimic the screen handling of other computers and run the programs installed for them. Your PortaPak can act as a terminal for any computer you care to name.
- Ability to read and write to other 5.25-inch disk formats - e.g. Kaypro and Osborne. Lets you exchange software directly with owners of different computers.
- User definable character set lets you work with foreign alphabets, scientific symbols, etc.
- Five input/output ports for connecting to printers, modems, etc.
- Wide range of peripherals including 5 and 10 Mbyte hard disks, built-in world modem, RAM drive, EPROM programmer, A/D converter, etc.

Radically different, distinctly Australian design using industry standard software.

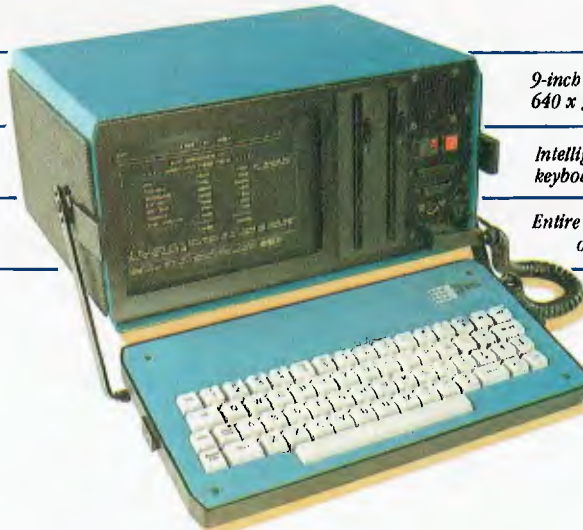
Two one-megabyte disk drives - total formatted capacity = 1.6Mb.

Z80B processor running at six megahertz.

*9-inch screen, 80 characters by 35 lines
640 x 304 graphics.*

Intelligent, capacitive, spill-proof keyboard.

*Entire system including software and sales tax -
only \$3,555!*



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CO.**

For the name of your nearest PortaPak dealer contact:
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80 Beauchamp Rd, Maraville, 2036.
Phone (02) 661 4877. Telex AA71063

*See Australian Personal Computer, Feb., 1984.

**See Australian Micro Computerworld, Nov., 1983.



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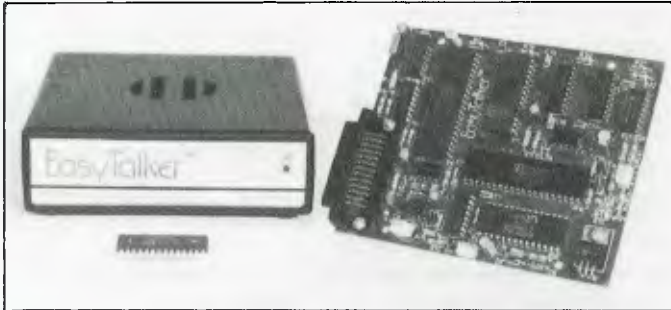
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Speech Made Easy

A NEW product from Robotron can be interfaced with a wide range of computers to convert text to speech. The EasyTalker operates using allophone-based architecture and is built around the General Instruments SPO256-AL2 chip.

Allophone-based speech units such as this can generate non-speech sounds like laughter and coughing. The Easytalker features a sophisticated text-to-speech conversion algorithm, automatic inflection,

inbuilt speaker and remote volume control.

The Easytalker can be used in games for home computers, educational computer projects and aids for the handicapped, as well as spoken alarms, data transmissions and remote data monitoring. It is based on a Z-80 microprocessor and has an inbuilt RS-232C interface.

For more information contact Robotron, PO Box 232, Mooroolbark 3138; phone (03) 720 2173.

Lower Import Duties

THE Federal Government has announced drastic reductions in import duties on computer products, and bounties for local manufacturers. The announcement was made by the Minister for Industry and Commerce, Senator Button, as a step towards developing a domestic computer industry.

Under the new arrangement the duty on computers will be reduced from a range of five to

24 per cent to a minimum of two per cent. Computer software will be duty-free, down from a range of five to 35 per cent.

The bounty scheme will pay 25 per cent on the value-added component in the local manufacture of computers. This is hoped to encourage the local manufacturing industry, which ranges from the giant IBM to the small specialist equipment manufacturers.

The Phone Company Strikes Out

LOOK out, IBM, the phone company is on the loose. American telephone giant AT&T has announced a number of computers that will compete directly with the likes of the IBM-PC.

The AT&T Personal Computer in particular offers a high degree of compatibility with the PC, but with many superior features. It is faster than the PC, offers true 16-bit performance, high-resolution graphics and multiple-printer outputs in the basic machine. A wide range of IBM software is also considered compatible with it.

AT&T PC can also operate in an integrated computing envi-

ronment with AT&T Unix-based 3B computers. This lets the PC work as one of up to 16 workstations with the 32-bit 3B minicomputers.

AT&T has also announced the Information Systems Network (ISN), a local area and campus network that combines fibre optics and existing, standard copper wire to link workstations, CPU and peripherals into one system.

The software available for the 3B and PC was also revealed, including word processing, spreadsheets, and industry-specific software such as retailing packages.

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Compute! in Australia

THE Compute! range of books has hit the Australian market through Australian publisher Holt-Saunders.

Compute! books are based on the same editorial standard as the parent magazine, and often appear on the best-seller computer book lists in the US.

The editorial style tends to be interactive with readers in order to achieve a high level of understanding and relevant information.

For more information on the Compute! range contact Holt-Saunders, 9 Waltham Street, Artarmon 2064; phone (02) 439 3633.

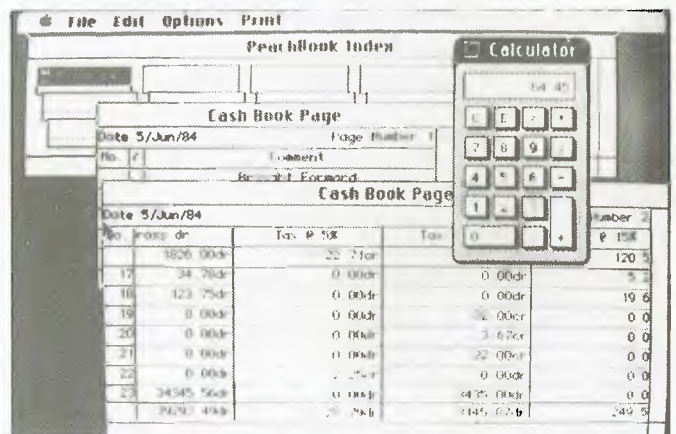
Software Hunters

WHERE do you go to get that elusive piece of software? Do you tear your hair out because it is only available in the United States? One company, Computer-Aided Graphics and Software Importers, has devised a solution to just such a problem.

If you can give them the name of the package, its manufacturer's name, address and phone number, they will track it down and get it for you, usually within a month.

Computer-Aided Graphics also puts an emphasis on the home-grown product, so if somebody in Australia is producing the package you want, they will try to get the software from here if they can. That not only means cheaper software, it helps the Australian industry and puts you closer to the producer in the event of something going wrong.

For more information contact Computer-Aided Graphics and Software Importers, 808 High Street, Thornbury 3071; phone (03) 480 3768.



MacAccounting

ACCOUNTING software for the Macintosh has been announced by JBA Micro. The software, the first of its kind for the Macintosh, is called MacAccounting and is from Peachtree Software.

The package is considered very quick to learn, with about 30 minutes claimed to be required to get up and running. The package consists of two modules at the moment, MacCash and MacLedger.

MacCash operates as a cashbook that takes full advantage of the extensive use of

graphics and mouse-driven functions. It looks like a simple cashbook on the screen but offers a speed and immediacy which is not possible with a manual system.

The MacLedger module also operates using graphics and mouse functions, and lets you maintain a sales/purchase ledger system.

The MacLedger package costs \$385 and MacCash \$275. Both modules will operate on a standard Macintosh with a single 400 Kbyte floppy disk drive. For more information contact Jenny Taylor at JBA Micro, 4th Floor, 8 Help St, Chatswood 2067. (02) 411 1144.



NECworking

... WHICH means that the NEC Advanced Personal Computer, winner of *Your Computer's Personal Computer of the Year Award* for 1983, has had a system built for it that will allow it to be built into a local area network.

The network is known as KANnet, developed by Kantek Inc in the USA. Among its features is the ability to run all existing single-user software in a multi-user environment transparent to the operating system. The network provides file security and does not require a dedi-

cated machine.

The network operates using a board plugged into each APC, which itself uses low-cost loops of video grade coaxial cable. The system allows one computer to access a device, such as a printer, disk or modem, that is connected to another computer, without any interruption to its operation.

KANnet will be supported in Australia by Entercom Computer Company, 136 Bridge Road, Richmond 3121. Entercom can be contacted on (03) 429 5883.

Osborne Casts a Web

LOCAL area networks are taking off in Australia, if the current surge of announcements of LANs for nearly all business machines is any indication. The latest announcement comes from Osborne, which has brought out a new product called the WEB. This lets 31 Osborne Executives and Osborne 1s connect into a LAN, with simulated multi-user capa-

bility obtained through the record-locking built into the software.

The system can be expanded by way of junction boxes, with each box permitting up to a 100-metre radius separation for each user station.

For more information contact Osborne Australia, 1st Floor, 93 York Street, Sydney 2000; phone (02) 290 3344.

Case-ing the Printers

CASE Communications has just announced the addition of three new printers to its product range. The printers, which are made in Japan, include a full-width daisywheel called Powertype and two near-letter-quality machines called Radix-10 and Radix 15.

The Powertype operates at 18 characters per second and

costs \$1775. The two dot matrix printers operate at 200 cps and cost \$1280 and \$1560 respectively. They feature single-sheet, continuous and roll paper feeding.

For more information contact Michelle Cahill at Case Communications, 1-3 Rodborough Road, Frenchs Forest 2086; phone (02) 452 5231.

MicroBee Games



BUNYIP ADVENTURE

Are you tired of adventures set in unfamiliar exotic locations? Well, now there is a truly Australian adventure set in our sunburnt outback.

The aim is to catch the bunyip and on the way you will encounter no end of Australian flora, fauna and folklore. Can you catch the jumbuck by the billabong? What is the significance of the black stump? And what was that swagman doing by the coolibah tree? As night approaches and you boil the billy, you hear the howl of the dingoes as the bunyip approaches. Will you be able to catch him?

\$20.00

GROTNIK WARS

Grotnik Wars is a high-speed three-dimensional video-game set in the surreal wastes of deep space. *Grotnik Wars* is more a simulation than a game. All objects conform to the laws of physics. You control the acceleration of your space ship.

What you see on your screen is what you would see if you looked out of a window of a space ship. In the background, the stars of the universe beyond provide a reference for your movement. Asteroids drift past eerily. A cluster of star dust floats by. All is peaceful. Suddenly sights appear on your screen. A fighter screams past and in the distance you see dots. You move forward to take a closer look. More sights appear on your screen as the enemy approaches from behind. As you accelerate to maximum speed you are thrust into the tumultuous crucible of a full-scale space-battle.

Grotnik Wars is uniquely inventive in the situations that it presents to the player. Even the author, after weeks of debugging and testing, still plays it and finds it challenging. He's hooked!

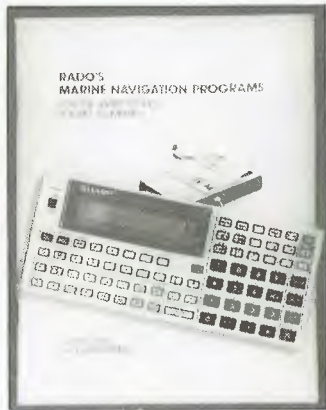
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Sharp goes Aquatic

AND now for the computer product that every reader has been waiting for ... the sort of product that only comes along once in a lifetime. Yes, all you Sharp PC-1401 owners can now turn yourselves into denizens of the rolling blue, as Rado Enterprises has announced its charge at the international navigation market with the Marine Navigation Programs.

The programs were designed for maximum ease of operation, require no knowledge of computers and only a basic knowledge of navigation. The complete package includes the computer already programmed, printer/cassette interface unit, a manual and cassette tape.

Rado, fully realising the potential of the product, plans to market it in the UK and Europe and the USA and Canada.

The program takes the drudgery out of navigation. All you have to do is plug in the variables and out comes the

answer. The major programs include voyage planning, dead reckoning, sun and star sights and position fixing, moon and planet sights and position fixing, time of twilight and meridian passage, star and planet finder, star and planet identification, great circle sailing, fix by distance off and bearing, fix by bearings of two objects and running fix by bearings of one object.

For more information contact Rado Enterprises, PO Box 5629, Gold Coast Mail Centre 4217; phone (075) 32 0527. □

Briefly . . .

■ The BBC Acorn will soon be supported by hard disks. The new drives are due to arrive at the Australian distributor, Barson Computers, based in Melbourne, and advance orders have already been taken from Queensland Newspapers, who will take the first two units for use in editorial applications.

■ The 1984 Edition of the *Medical Computer Systems Guide* is now available. Published by Business Technology, it details 25 systems relevant to GPs, specialists, hospitals, pathologists and homeopaths. There are checklists for buyers, and courses available through the company to aid the medical computer buyer. Business Technology also offers a tele-

phone hotline for advice on buying computers for medical use. For more information contact Business Technology, 97 Bradfield Road, Lindfield 2070; phone (02) 467 2155.

■ BF&N Publishing has announced the third volume in the highly successful *Wildcards* series. In the same style as the previous two volumes,

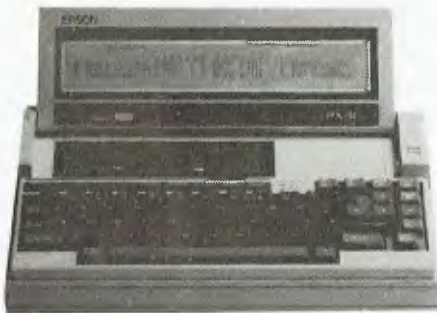
Wildcards Volume Three offers help for Microbee users in the areas of Tips and Techniques, Applications, Graphics, Utilities, Machine Language Game Tutorial and Small Business. It will retail for \$16 and is available from bookshops, Microbee dealers and others. For more information contact BF&N Publishing, PO Box 85, Williamstown 3016. □

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REVIEW

One of the major reasons PCs are finding a home on executives' desks is their number-crunching ability, particularly coupled with the ability to present numeric data as graphs for swift comprehension. Les Bell reports on the latest device for producing take-away graphs ...

Roland DXY800 Plotter

ROLAND HAS been in the electronics business for quite a few years, but is a recent entrant to the computer game. Musos, especially, will know the company for its excellent music devices, ranging from conventional analogue synths to vocoders and computer-controlled music boxes.

This Japanese company has now decided to enter the computer peripherals market, and is starting to make its presence felt with a range of video displays and plotters. At the recent PC 84 Show in Melbourne, the displays were much in evidence, but this article is devoted to its top-of-the-range plotter, the DXY-800.

This is a particularly neat and attractive unit which compares well with much more expensive machines. Most low-cost plotters are based on drum or pinchwheel designs, which move the paper in one direction while the pen moves at right angles. The DXY-800, however, is a flat-bed plotter; in this design the paper is clipped into place on the drawing surface and an arm, which carries the pen, moves over it.

The DXY-800 is of modern and stylish design, and is quite compact at 496 by 435 mm, with a height of just 77 mm. If space is at a premium, the plotter is supplied with a leg stand which allows it to be tilted to 60 degrees, reducing the footprint markedly. The unit is also quite light, at just over 4 kg.

Down the left side of the paper bed is a rack of eight coloured pens. This is the feature that distinguishes the DXY-800 from its kid brother the DXY-101; the DXY-800 can plot a chart or graph in up to eight colours with no manual intervention to change pens. The result is faster, more

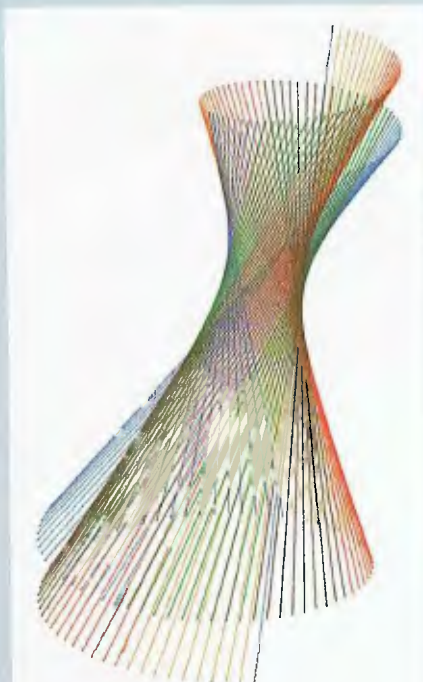
accurate and more convenient drawings.

At the top of the plotter surface is the electronics housing, which also covers the drive mechanism. The plotter movement is controlled by a pair of stepper motors in here, together with associated electronics. Also at top right is the home switch and a pen up/down switch, together with power/error and pen-up indicators. Pressing the home button causes the plotter to replace the pen it is holding and return to the home position, while the pen up/down switch does what you might expect.

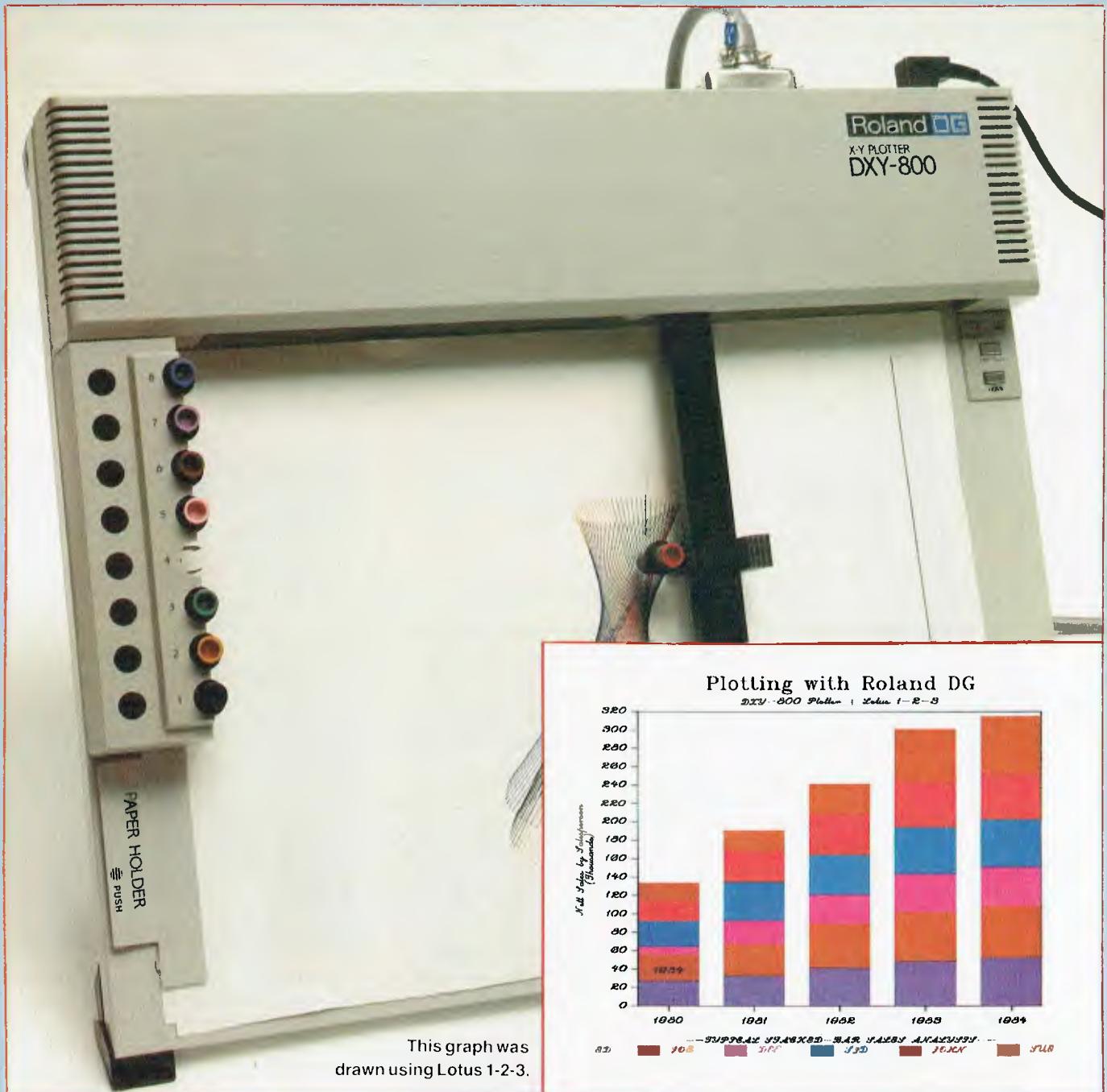
At the rear of the machine are various connectors and switches. At the extreme left (looking from the rear) is the power inlet, and next to it the power switch. Then comes a small slide switch controlling drawing speed, and one for seven or eight-bit data. Then comes the parallel connector, followed by the baud rate and related switches for the serial port and the serial connector itself.

Having both types of interface on the system makes for far greater versatility; for example, the parallel interface on one of our systems refused to talk to the DXY-800, so we simply switched across to the serial type. This could also be important in applications where the plotter must be shared by several users with different computers.

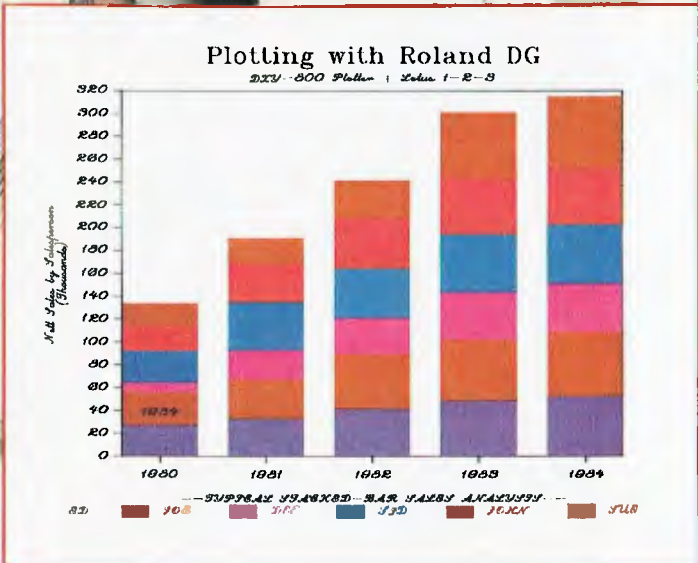
The serial interface is slightly non-standard, however, and so attention must be paid to the correct connection of the handshaking channel and the appropriate status bits in the computer's UART. Actually, the problem is not so much that the interface is non-standard, as that the RS-232C 'standard' does not actually say what goes where,



An example of a design achieved by simple programming with the DXY-800.



This graph was drawn using Lotus 1-2-3.



instead suggesting that 'here are a bunch of signals, and what you use them for is up to you'.

For some machines, such as the Apple IIe, special interface cards are available, but others, such as the IBM-PC, will operate with the plotter connected in place of the regular printer. No special cables are required. This has the added benefit that commands can be sent to the plotter using BASIC's LPRINT statement.

While the plotter is attached to the printer port of the computer, that doesn't mean that you can't get listings, for example. By switching the plotter on while holding the home

button down, one can force the plotter into printer mode.

In this mode, the plotter simply prints everything that is sent to it, rather than trying to interpret it as graphics commands. Lines of up to 123 characters can be printed, with up to 53 lines per page; at the end of each page, the pen resets to the top left corner, ready for the paper to be changed. In this mode, the DXY-800 is not a serious printer, but it could be handy on occasion. The major reason for using this mode is in debugging programs by examining exactly what strings are being sent to the plotter.

Commands

The DXY-800 has a particularly rich set of commands. In the early days of plotters commands consisted of moving the pen to a particular position, dropping it, moving it elsewhere and raising it. In other words, all you could draw was straight lines, and shapes like circles and arcs had to be achieved some other way.

Today, even relatively low-cost plotters boast commands for all kinds of drawing activities, including arcs, dashed lines, cross-hatching and printing.

All commands are sent to the

SPECIFICATIONS AND REPORT CARD

Unit: Roland DG DXY-800 plotter
 Made By: Roland Corp
 I/O: Serial and parallel
 Graphics: Yes
 Best points: Excellent value for money
 Worst points: None found!

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

Extras included: Eight colour pens
 Options: Pen holders
 Price: \$1395.00
 Review unit from: Roland Corp. Australia, 39 Victoria St, Fitzroy 3065. (03) 417-1800.

plotter as ASCII character strings, and in most cases consist of a single letter to identify the command, followed by various parameters which may be required. Commands are terminated by a carriage return/line feed pair.

The commands are summarised in Table 1.

The simple commands are fairly obvious. The home command returns the pen to the 0,0 co-ordinates (which are established by the position of the pen when the plotter powers up), but unlike the home button, does not return the current pen to its holder. The move command simply moves the pen without drawing, and the draw command drops the pen and draws a line between the current position and the co-ordinates listed.

An alternative to drawing lines between absolute co-ordinates is the use of relative movement with the R and I commands, which are relative versions of the M and D commands respectively. The x and y data here are not co-ordinates to which the pen should move; they are, instead the distances through which the pen should move to its new co-ordinates.

For line drawing, the DXY-800 can be set up to draw either continuous or dotted lines. The L command takes two forms: L0 sets continuous line drawing (the default) and L1 sets the plotter to draw dotted lines. The B command sets the pitch of the dotted lines in 0.1 mm increments.

Printing can be achieved using the

P command, which prints everything that follows on the command line. Fifteen character sizes are available through the S command, and print can be rotated through 90 degrees at a time to allow vertical and upside-down printing.

Circles are available through a number of commands. The C command (Cx,y,r,φ1,φ2) draws a circle or arc with centre x,y and radius r, starting at angle φ1 and ending at φ2. Another command, E, draws a circle or arc at the current pen position, so that the co-ordinates need not be respecified for continuous drawing.

Three other commands are used for drawing concentric circles, pie charts and the like. The A command sets up the centre co-ordinates for subsequent G and K commands. The G command works just like the C command, and draws a circle with its centre at the co-ordinates given in the A command. The Kφ, I1, I2 command draws lines radially from that point, starting at I2 and continuing outward to I1.

Axes can be drawn, with tick marks, using the X (Xp,q,r) command, which draws the axis (p=0 for y and p=1 for x) with r tick marks spaced every q x 0.1 mm.

The N command draws one of ten special characters at the current position; this is particularly useful for labelling graph lines when multiple graphs are overlaid.

The J command makes the plotter return the current pen to its holder

and pick up the specified pen, while the escape sequence ESC0 (or 1 or 2) puts the plotter into plot, print or self-test mode respectively.

Finally, the T command (Tn,x,y,d,t) is used for cross-hatching areas, and is particularly useful on bar-graphs. With n=1, it simply hatches the specified area, with n=2 it just draws a rectangle, and with n=3 it does both. The d parameter is the space between hatches, while t is the hatching angle.

Table 1. DXY-800 commands.

Command	Input Format and Data
A Circle Centre	Ax,y
B Line Scale	Bl
C Circle	Cx,y,r,φ1,φ2
D Draw	Dx1,y1,x2,y2,...,xn,yn
E Relative Circle	Er,φ1,φ2
G A + Circle	Gr,φ1,φ2
H Home	H
I Relative Draw	Ix1,y1,x2,y2,...,xn,yn
J Pen Change	Jn
K A + %	Kn,I1,I2
L Line Type	Lp
M Move	Mx,y
N Mark	Nn
P Print	Pc1c2...cn
Q Alpha Rotate	Qn
R Relative Move	Rx1,y1
S Alpha Scale	Sn
T Hatching	Tn,x,y,d,t
X Axis	Xp,q,r
ESC Mode	ESCn

A sample program (listing 1) shows how the plotter commands are used.

Listing 1.

```

10 REM PRINT AXES
15 CS="M200,200"
20 GOSUB 2000
30 CS="X0,100,20"
40 GOSUB 2000
50 CS="M200,100"
60 GOSUB 2000
70 CS="X1,100,10"
80 GOSUB 2000
100 REM LABEL THEM
110 CS="M1200,1420"
120 GOSUB 2000
130 CS="P100,140"
140 GOSUB 2000
150 CS="M720,2100"
160 GOSUB 2000
170 CS="P100,2000"
180 GOSUB 2000
190 CS="M500,1400"
200 GOSUB 2000
210 RESTORE
220 READ Y
230 WHILE Y <= 8
240 CS="X1,100,"+STRS(Y)+"",20,2"
250 GOSUB 2000
260 CS="P200,2"
270 GOSUB 2000
280 READ Y
290 WEND
300 CS="H"
310 GOSUB 2000
320 DATA 550,400,650,175,0
3300 END
3400 REM SUBROUTINE TO OUTPUT PLOTTER STRINGS
3500 PRINT CS
3600 RETURN
    
```


Performance

The DXY-800 has fairly good overall performance. Its specified resolution is about one-third that of the Hewlett-Packard HP 7475A plotter, but actual performance seemed to be better than that. Step size is 0.1 mm and the repetition accuracy is claimed to be 0.3 mm or less. In tests we did, overdrawn lines were marginally darker, but there was no visible evidence of misalignment.

The plotting speed is more than acceptable. People who complain endlessly about slow printers never seem to worry about plotters, perhaps because they are mesmerised by the plotter's motion!

Software Support

Roland is not simply waiting for the world to beat a path to its door with this product, but is keenly aware that the success of a plotter depends upon software to drive it. To this end, the company has organised a number of software packages for business graphics and other applications.

Paramount among these is a DXY-800 driver for Lotus 1-2-3. This is quite simple to install on your Lotus disk, and enables you to plot 1-2-3 graphs on the DXY-800 with no need for all the programming referred to above. A couple of sample plots we did came up simply with all the labelling and other niceties provided by 1-2-3. The Lotus driver is available free from Roland dealers.

Also available from Roland dealers is the BPS Business Graphics program with plotter drivers. This is a large system, with a massive manual to match, but much to my relief, the manual reflects not the complexity of the program but the excellence of the documentation. Unlike most graphics programs, which are menu-driven (what was that comment about trainer bicycles?), this program is command-driven.

BPS can handle a number of graphic formats, including bar, line, pie charts and various combinations, and has a wide range of options for shading and solid colour. Best of all, it comes with a number of comprehensive examples with which the user can learn all about the system while working through the tutorial part of the book.

Table 2. Software programs compatible with the Roland DXY-800 that are already available.

Company Name	Program Name	PC/Operating System
Lotus Development Corp	Lotus 1-2-3	IBM PC-DOS
BPS Inc	Business Graphics	IBM PC-DOS
Decision Resources	Chartmaster	IBM PC-DOS
IMSI	4-Point	IBM PC-DOS
Sorcim Corp	Supercalc 3	IBM PC-DOS
Apple Computer Inc	Apple Bus. Graphics*	Apple DOS 3.3
West Coast Consultants	Curve II	Apple DOS 3.3
Autodesk	Autocad	IBM PC-DOS/MS-DOS
Robocom	Robographics	Apple DOS 3.3
Ess Consultants	Ess 2D	MS-DOS 1.25 upwards
Ess Consultants	Ess Plot 2	MS-DOS 2.0 upwards
ACS/Tamsys	4-Point Graphics	MS-DOS 2.0 upwards
GCS/Intelligence UK	Micro Supergraph	MS-DOS 1.25 upwards
Pace/Byte Shop	Business Graphics	MS-DOS 2.0 upwards
Grafox	Data Plot 3	MS-DOS/CPM-80/86
Free with Columbia	Fast Graphs	MS-DOS 1.1 upwards
Carrington	Tek 4010 Emulation	MS-DOS 1.25 upwards
Hydrotechnica	Watchem-1	MS-DOS 1.25 upwards
Hydrotechnica	Aquifier Test Pack	MS-DOS 1.25 upwards
Hydrotechnica	Gino-Graphics	MS-DOS 1.25 upwards
Hydrotechnica	General Plotting	MS-DOS 1.25 upwards
Hydrotechnica	Regression Analysis	MS-DOS 1.25 upwards
Hydrotechnica	Time Series Analysis	MS-DOS 1.25 upwards
Grafox	Data Plot +	MS-DOS/CPM-80/86

*Apple Business Graphics requires Apple Pik for Roland DG plotters; available from Roland.

Table 3. Software programs soon to be compatible with Roland DXY-800 plotter.

Company Name	Program Name	PC/Operating System
Graphic Communications	Graph Writer	IBM PC-DOS
Transparent Data System	U-Graph	IBM PC-DOS
Advanced Computer System	Bar Graph	IBM PC-DOS
Abacus Software	Chartpak	Commodore 64
Roland DG Corp	Logo Graphics Pack	Apple IIe

In the educational sphere, plotters and Logo's turtle graphics are a serendipitous combination, and a company called Perceptive Systems has come up with a translator program which allows Apple Logo to drive the DXY-800. With this package, standard Logo packages and procedures will drive the plotter with no side-effects, other than the obvious limitations of wrap boundaries and an inability to erase.

Also from Perceptive Systems is a package called 'KidKad', which may be released by the time you read this. This rubber band graphics

system allows the user to 'freehand draw' on the plotter using a joystick for control.

A wide variety of other software packages, under virtually all operating systems, can also drive the Roland plotter, so there's no chance of it collecting dust for want of things to do.

As well as the DXY-800 and its little brother the DXY-101, Roland is planning to release a new model of the plotter later this year, which will have additional features to the DXY-800, and in early 1985 we should see an A1 version too. □

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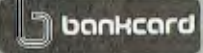
WORDSTAR word processing package and your professional editor and layout artist.

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PROCESSOR:

Z80A running at 3.375 MHZ

KEYBOARD:

60 key FULL SIZED QWERTY layout with full travel.

DISPLAY:

Direct video to external monitor.

80 by 24 and 64 by 16 character display modes, high resolution PCG graphics to 512 by 256 pixels. Upper and lower case with full

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INPUT/OUTPUT:

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

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THE

Great Database Search

CONTINUES...

The Great Database Search continues in earnest even if, in monthly magazine terms, the 'episodes' are spread out. Believe us, it takes a l-o-n-g time to get right into some of these packages.

This month Matt Whelan takes a closer look at DataFlex, which has been given a solid workout in the Federal Publishing offices handling advertising bookings for Revs Motorcycle News (they're our favourite guinea-pigs: they publish fortnightly, have a high booking volume, use multiple related files and need instant information retrieval based on multiple keys ... it is a complex application. Every time they get used to a system, we switch them to a new test package just to confuse things – and they soon tell us if the new program doesn't do the job.)

Rose Vines, a staff programmer who, like most of us, has a love/hate relationship with dBase II, has been sitting at her terminal muttering unfriendly phrases since we gave her Knowledgeman to review – its extra features would have halved the work she has just put into a dBase system for the company's printing division. Starting on page 42, she explains why it's the most impressive single-user database package we've seen. (We've even heard people from Ashton-Tate, the company behind dBase, express quiet admiration of Knowledgeman. They seem quite relieved that what they see as 'marketing deficiencies' are keeping the product from gaining the recognition it deserves).

Meanwhile, the office is slowly filling up with further database packages which will grace these pages in coming months. Already we have dBase III, Optimum, Condor 3, Superfile, T/Maker III, Omnis, and Sensible Solution crowding our desks, with several more packages either on the way or on offer (we're trying to surface from under the current pile before we volunteer to take more. How did we ever get ourselves into this, anyway?).

Naturally, one of the most interesting of these is dBase III, which is dBase II with everybody's wish-list included. It has major extensions to its specification, and significant additions to its programming language

– it's a very nice looking package indeed.

We do have one major reservation. We object particularly strongly to Ashton-Tate's decision to release it for the IBM-PC and workalikes only. While that might be a commercially sound decision given the IBM dominance of the industry, it is also a commercially greedy decision given Ashton-Tate's position in the industry. Yes, we may be a little biased, but we're also convinced Ashton-Tate's position is hard to justify for these (three of many) reasons:

- dBase III is written in a modern, high-level language which is easy to port to different machines/operating systems. Development cost for non-IBM releases should be negligible.
- An awful lot of people who helped Ashton-Tate get where it is have been left out in the cold by this decision. In many cases they have stuck with dBase II despite its limitations because of the promise of new and better versions. Now they are faced with a choice of three unacceptable alternatives: stick with dBase II, even though it's not really up to the job on some of their more complex applications; scrap dBase and all their current applications and start afresh with another database manager; or scrap their hardware and step up/down to an IBM.
- Most of Ashton-Tate's competitors support multiple machines/operating systems. One of the first things we look for in evaluating a product is such wide support, because we don't believe users should be 'locked in'. If I spend a lot of time, trouble and money developing database applications on my IBM-PC and then find my office needs a multi-user machine (just to provide more computer access, not necessarily to allow multi-user database work), what do I do? I don't really want to buy anything which doesn't provide an upgrade path.

The Great Database Search started out looking for a viable alternative to dBase II. dBase III may well be the 'winner' for some, but for others this series has been turned into a search for an alternative to Ashton-Tate ...



Dataflex

REVIEWED

DATAFLEX isn't really what you'd call a dBase II competitor. It is at the same time both too elegantly simple, and too complex and powerful, to be considered alongside the Ashton-Tate product.

In fact, DataFlex isn't a database package at all if you consider dBase the 'popular' definition of the term. For example, it doesn't allow you to just fire it up and inspect/manipulate your data with interactive, direct commands.

According to Data Access Corporation, the people behind DataFlex, the package is 'Application Development Software' rather than just a database manager. And they're right: DataFlex



DATABASE SEARCH

Dataflex

SOFTWARE REPORT CARD

Program:	Dataflex			
Made by:	Data Access Corporation			
Hardware required:	Just about anything with an Intel processor!			
Best points:	Proper relational database, enormous power, simplicity of standard data-handling tasks			
Worst points:	No interactive mode; manual			
Ratings:	Excellent	Very Good	Good	Poor
Documentation:			•	
Ease of use:	•			
Functionality:	•			
Support:		•		
Value for money:			•	
Price:	From \$900 to \$2000, depending on version			
Review package from:	Intelligence Australia, 4th Floor, 204 Clarence St, Sydney 2000. (02) 267-1711.			

you were used to writing in dBase. Until this realisation dawns on you, you will be uncomfortable with DataFlex; afterwards you'll love it.

Data Access Corporation has at least two distributors in Australia: Intelligence Australia, in Sydney, and Australian Microcomputer Solutions, in Geelong. We've found both of them dedicated to the product, and both are doing good jobs of supporting and promoting it.

Power, at a Price

The power of DataFlex doesn't come cheap; the single-user version for eight-bit machines is almost \$1000, and the price climbs to around \$1800 for a multi-user 16-bit version.

While figures like that might be reasonable for such a powerful development system, the fact that runtime versions (the basic package which allows you to run pre-configured applications, without being able to create new files or develop your own data entry/edit modules) range from \$500 to \$1000 is a worry; it puts DataFlex out of the 'mass-market' class that micros have created and suggests it could only be used to develop high-cost vertical market applications or custom packages for individual contracts.

On anything but custom, one-off systems, the developer would have to think long and hard about giving Data Access \$500 to \$1000 out of every sale made when development tools like Digital Research's Access Manager and Display Manager (which involve no runtime licensing fees) are available for high-level languages like CB-80/86, PL/I, and Pascal/MT+ (DataFlex, incidentally, is written in MT+).

Admittedly DataFlex would make most jobs easier, but whether it would make a job \$10,000 easier – the extra cost involved in selling between 10 and 20 copies of your application – is questionable.

Overall, I feel Data Access Corporation's pricing strategies are a little (maybe even a lot) out of touch with the micro market if you evaluate DataFlex purely as a development system.

Taken as an end-user product, the steep pricing is more realistic – there is little, if anything, on the market to match its power, its multi-user



is an extremely powerful development tool that is ideal for programmers developing their own software packages.

However, a few little extras thrown in with the DataFlex package to make the development programmer's life that little bit easier also turn it into an easy-to-drive data handler for the less expert.

These extras – like pre-written macros to handle data entry and reporting, plus 'auto-pilot' file definition and program creation – give the newcomer instant access to the sort of power that would require an in-house programmer in the case of dBase.

If you cut your programming teeth on dBase II, you'll hate DataFlex – for a little while. Eventually you'll hate

yourself, for failing to discover DataFlex sooner.

The initial problem will be the fact that you'll approach DataFlex from the wrong angle. Your preconceived notions about how to get results from database packages will cause you to dive in at DataFlex's 'deep end', writing reams of code that make full use of the extensive language.

It will all be a waste of effort, as DataFlex requires a fresh approach. The simple bits at the front of the manual – the ones you moved straight past on your way to the 'advanced' sections – are all you need for most applications.

It's hard to come to grips with at first, but the basic, auto-pilot-produced programs are more powerful than those – 10 or 20 times the length –

Vice President of New Technology, Ashton-Tate — Wayne Ratliff said:
“Although we have kept all the features of DBASE II
that have made it so popular, we rewrote DBASE III in 'C' language from the ground up
to have greater capabilities, storage, speed, power and ease of use,
and to take advantage of the power and technology of 16 bit and larger computers.”

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3. Variable length text field up to 4K bytes per entry
4. 4,000 bytes per record
5. 10 data base files in use simultaneously
6. Fast internal sort and improved indexing
7. 16 digits of numerical accuracy
8. Enhanced reports capability
9. On line help system
10. Full screen formatting

System Requirements

1. IBM PC XT and all PC compatible computers
2. Minimum 256K bytes RAM, two 5¼" floppy disc drives
3. Monochrome or colour display, any printer with at least 80 columns
4. PCDOS 2.0 operating system

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Address

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AMS AUSTRALIA


```

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Surname             : _____
Company Name       : _____
Address Line 1     : _____
Address Line 2     : _____
Suburb             : _____      Postcode : _____
Last Purchase      : _____      Amount: _____
Total Purchases    : _____
    
```

Figure 1. All you need to do about screen design.

```

FILE DEFINITION LISTING FOR FILE #7
*****
FILE ROOT NAME      = MAILLIST
USER DISPLAY NAME   = MAILLIST
DATAFLEX FILE NAME = MAILLIST
*****
RECORD LENGTH = 170 (USED = 157)
MAX NUMBER OF RECORDS = 10000 (USED = 01)
DELETED SPACE IS REUSED
MULTI-USER RE-READ ACTIVE
*****
FIELD  FIELD  FIELD  FIELD  DEC  MAIN  RELATES--TO
NMBR   OFFSET  LEN   TYPE  PTS  INDEX FILE  FIELD
-----
1      1       15   ASCII  0    0    0      CNAME
2      16       20   ASCII  1    0    0      NAME
3      36       31   ASCII  2    0    0      COMPANY_NAME
4      67       31   ASCII  0    0    0      ADDRESS_1
5      98       31   ASCII  0    0    0      ADDRESS_2
6     129       15   ASCII  0    0    0      SUBURB
7     144        4   ASCII  3    0    0      POSTCODE
8     148        3   DATE   0    0    0      LAST_PURCHASE
9     151        3  NUMERIC  2    0    0      PURCH_AMOUNT
10    154        4  NUMERIC  2    0    0      TOTAL_PURCHASES

INDEX 1:  FIELD SEGMENTS: <2> <0>
INDEX 2:  FIELD SEGMENTS: <3> <0>
INDEX 3:  FIELD SEGMENTS: <7> <0>
    
```

Figure 2. The file definition Autodef produced from Figure 1.

capabilities, or its support for a wide range of operating systems.

You can get DataFlex for CP/M, CP/M-86, MP/M-86, MS-DOS, PC-DOS, TurboDOS, Novell Sharenet, PC-Net, 3COM, DMS Hi-Net, Molecular N-Star, Televideo MmmOST, Action DPC/OS, Omninet, Network, and IBM PC with Corvus – a useful selection both for the applications developer and for the user who might need an upgrade path.

DataFlex has impressive specifications (where differences exist between 8- and 16-bit systems, the 8-bit figures are in brackets): each 'system' can have 125 data files (you could have other systems on different disks), of up to 65,535 records each and 255 fields per record; each file can have nine indexes (four) plus one 'ad hoc' index, of up to six (four) elements each; record size is limited by available memory, but should be more than 4000 bytes, while the number of data files which can be open at once is also memory-limited to at least 10 (five) plus associated indexes; maximum program size is 32,000 lines, and you can have up to

32,000 variables, depending again on available memory. Memory requirement for eight-bit systems is 52 Kbytes, for 16-bit systems 100 Kbytes.

Instant Applications

It's pretty easy to put DataFlex to work immediately you get it out of the wrapping. Just by following the steps in the introductory section of the manual (the latest one is a significant improvement) you can have a working system up and running the same day.

You don't even have to formally create or define your data file structure – just draw your data entry screen using the supplied editor or your favourite word processor. You start the 'page' off with a slash, followed by a screen name, and then put your prompts wherever you like, followed by underline characters where you would like data to be entered.

If a field will contain numbers, you signify that by putting a dot in place of one of the underlines (at the end if you don't want decimals, or in the position you would like the decimal

point). If it will be a date field (DataFlex has a special Date data type; it stores dates as Julian numbers, allowing direct date calculations), you draw it with the slashes between day, month, and year.

You end the screen design with a slash and an asterisk, and that's just about it – you 'feed' the screen file to Autodef, which asks you a series of questions and then creates the necessary file, indexes, and DataFlex entry configuration (they're called configurations, not programs, in this system) for you.

For example, I drew the screen in Figure 1, and when I ran Autodef it put the design up in front of me and went through the fields one by one, asking me what I would like to call them, and then asked me which fields I would like as index keys.

It then created the data file, the necessary indexes, and the data entry/editing program ready for compilation. Figure 2 shows the file definition Autodef came up with.

There are a couple of points worth noting in this file definition. The first is the figure for the maximum number of records – it asks you how many records you will have and, if you like, it can pre-initialise the disk space for them. This option can be used to ensure your data doesn't spread all over the disk as the file grows. The number isn't a limit – it can be changed at any time.

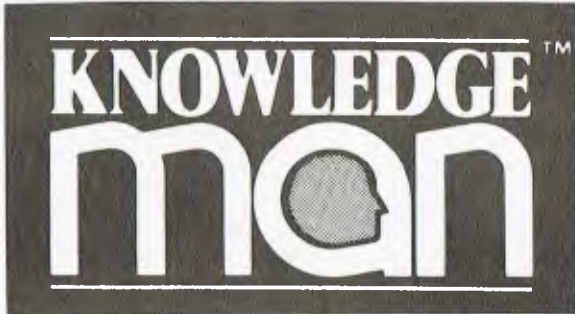
Note also the last two columns before the field names – you can define here the relationships between files (you have to use Filedef to do this – Autodef can't manage it), and from then on DataFlex 'knows' them and will automatically bring related records to the screen for you when needed. It is this automatic handling of related files which makes DataFlex so easy to use in complex applications.

All key fields in DataFlex indexes must be unique, which is why the indexes in this sample are specified as having field 0 as their second element – if you tell Autodef you may be entering duplicate data, it will include the record number (field 0) in the index.

Something you can't do with Autodef, but can add later with Filedef, is include 'overlap' fields – fields which don't take up file space,

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but instead point to combinations of other fields. This feature is particularly useful as it can be used to eliminate any limitation on the number of elements in an index.

The last thing Autodef does is to produce the source code for your data maintenance program, ready for the DataFlex compiler. Figure 3 shows what it looks like.

Unbelievably simple, right? Well, it's not as simple as it looks – the line 'ENTER MAILLIST' invokes the ENTER macro, which is 60 lines worth of programming: the bit that follows is just a subroutine called by the macro, which is why it is followed by a RETURN statement.

As far as the user is concerned, however, it *is* unbelievably simple. If you run that .FRM file through the compiler, and then execute the resulting .FLX file, your screen design appears in front of you ready for data entry. If you want to edit an existing record, you just place the cursor in one of the key field windows, type the name or other detail you are looking for (or part of it), and hit the FIND key.

You can also hit the FIND key on an empty field to get the first record, and use the NEXT and PREVIOUS keys to step through the records.

The nice thing about these keys – *flexkeys* as they are called – is that you can define them yourself during installation if you don't like the defaults. You can use this feature to set DataFlex up to operate with the same editing keys as your word processor, for example, or to make use of your terminal's function keys.

Once you've done so, using the SETSCREE.COM/COM installation utility, you can print the current definitions for both key assignment and terminal configuration to a file or the printer for future reference.

The flexkeys can all be 'trapped' by your programs, and their behaviour modified (or even disabled) to give you complete control over data entry.

Adding Bells and Whistles

The Autodef-produced data entry program is fairly basic, but with little work you can take the ENTER macro a lot further before you need to think about adding any serious programming of your own.

Each 'ENTRY' command line can

```

/MALLSCREEN

First name/ints : _____
Surname         : _____
Company Name   : _____
Address Line 1 : _____
Address Line 2 : _____
Suburb         : _____ Postcode : _____
Last Purchase  : _____ Amount:  _____
Total Purchases : _____

/*
OPEN MAILLIST
ENTER MAILLIST
AUTOPAGE MAILSCREEN
ENTRY MAILLIST.CNAME
ENTRY MAILLIST.NAME
ENTRY MAILLIST.COMPANY_NAME
ENTRY MAILLIST.ADDRESS_1
ENTRY MAILLIST.ADDRESS_2
ENTRY MAILLIST.SUBURB
ENTRY MAILLIST.POSTCODE
ENTRY MAILLIST.LAST_PURCHASE
ENTRY MAILLIST.PURCH_AMOUNT
ENTRY MAILLIST.TOTAL_PURCHASES

RETURN
ENTEREND
ABORT
    
```

Figure 3. The source code for a data maintenance program.

be followed by a number of options, single or combined, including: automatic 'find' of a record matching entered data, skipping a window if a previous field's FIND has filled it, forced find (that is, data matching a current record must be entered, and the record found, before proceeding), upper case conversion of entered data, mandatory entry (no skipping to the next field), range and validity checks, and specifying windows as display-only, so that information in those fields cannot be changed.

Values in windows (on-screen fields) can be calculated from other windows, and the order of entry can be changed by naming the windows explicitly (mailscreen.1 is the first field, and so on) instead of using the AUTOPAGE command, which works through the fields sequentially.

Multiple related files can be accessed simultaneously by simply OPENING all the required files, including them on the ENTRY command line, and using their field names in the appropriate places on the screen.

For example, Figure 4 shows a multi-file data entry screen that takes full advantage of DataFlex's relational capabilities. It is part of a test system being run by an associated magazine group in this office, handling advertising bookings from common advertisers across a range of titles.

The details are kept in three files – the advertisers file (the information is used hundreds of times, but only has

to be entered once), the magazines file (same here), and the bookings file (which need carry only the information relating to the individual booking, plus a couple of small fields which point to each booking's related records in the other two files).

In this case, the operator enters a magazine number, and the magazine name is found and placed in the next field. Then an account number is entered, and the advertiser's full details are brought to the screen. None of this name and address-type data is duplicated in the bookings file, yet as far as the operator is concerned it might as well be – since any time the booking is referenced, the extra information is *automatically* provided by DataFlex as long as the screen design requires it.

Moreover, the information required to identify the relationship (such as account number and magazine number) is saved in the appropriate fields in the bookings file record automatically, even though this program makes no mention of doing so! DataFlex knows, through the file definition, that the relationship is based on these fields, so it moves the information brought to the screen from the related files into the bookings file record without ever having to be told to do so by the programmer.

In this particular module, the RETAIN options allow multiple similar bookings to be entered for an advertiser without having to retype the common details – the operator

DATABASE MANAGEMENT SYSTEMS

d foreign language. 2 or 3

```
.list files
  DATABASE FILES NBRRCDS LAST UPDATE
  HOMES DBF 1005 11/01/83
.use homes
.list homes selling for < 50000
*** SYNTAX ERROR *** RE-ENTER
.list structure
  FLD NAME TYPE WIDTH DEC
  001 ADDRESS C 025
  002 SELLPRICE N 009 002
  003 AGENT C 025
.list for sellprice < 50000
```

R language.

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```

/BOOKFORM
Enter an account number and hit the FIND key to find that advertiser.
    <<< Hit the CLEAR key TWICE to clear record for new advertiser >>>

Magazine : _____ (Title: _____)
Account   : _____ Advertisers file record number: _____
Issue Date : ____/____/____ Order Number: _____ Order Starts: ____/____/____
Size      : _____ Shape : _____
Product   : _____ Repeat : _____
Dollars   : _____

Key Number : _____ Today's Date: ____/____/____
Authority  : _____

Advertiser : _____ City : _____
Contact    : _____
Agency    : _____ City : _____
Contact    : _____

/*
INTEGER HOURS
INTEGER MINS
DATE TODAY
SYSDATE TODAY HOURS MINS
OPEN ONE
OPEN ONESHOTS
OPEN ADNAMES
MOVE TODAY TO BOOKFORM.15
ENTER ONE ONESHOTS ADNAMES
AUTOPAGE BOOKFORM
ENTRY ONESHOTS.MAG_NUMBER {AUTOFIND,FINDREQ,NOPUT,RETAIN}
ENTRY ONESHOTS.MAG_TITLE {DISPLAYONLY,RETAIN}
ENTRY ADNAMES.ACCOUNT {AUTOFIND,FINDREQ,NOPUT,RETAIN}
ENTRY ADNAMES.RECNUM {DISPLAYONLY,RETAIN}
ENTRY ONE.ISSUE_DATE {RETAIN}
ENTRY ONE.ORDER_NUMBER {RETAIN}
ENTRY ONE.ORDER_STARTS {RETAIN}
ENTRY ONE.SIZE {RETAIN}
ENTRY ONE.SHAPE {RETAIN}
ENTRY ONE.PRODUCT {RETAIN}
ENTRY ONE.DOLLARS {RETAIN}
ENTRY ONE.REPEAT {RETAIN}
ENTRY ONE.KEY_NUMBER {RETAIN}
ENTRY ONE.AUTHORITY {RETAIN}
ENTRY ONE.TODAYS_DATE {RETAINALL}
ENTRY ADNAMES.ADVERTISER {DISPLAYONLY,NOPUT,RETAIN}
ENTRY ADNAMES.ADVERTISER_CITY {DISPLAYONLY,NOPUT,RETAIN}
ENTRY ADNAMES.ADVERTISER_CONT {DISPLAYONLY,NOPUT,RETAIN}
ENTRY ADNAMES.AGENCY {DISPLAYONLY,NOPUT,RETAIN}
ENTRY ADNAMES.AGENCY_CITY {DISPLAYONLY,NOPUT,RETAIN}
ENTRY ADNAMES.ACCOUNT_EXEC {DISPLAYONLY,NOPUT,RETAIN}

RETURN
ENTEREND
ABORT

KEYPROC KEY.USER
OUTPUT BOOKFORM
ENTAGAIN
RETURN

// DISABLE FWD AND BACKWARD KEYS

KEYPROC KEY.NEXT
ENTAGAIN
RETURN

KEYPROC KEY.PREVIOUS
ENTAGAIN
RETURN

ABORT
    
```

Figure 4. A multi-file data entry screen taking full advantage of Dataflex's relational capabilities.

only changes the altered fields, then hits the SAVE key. The form can be cleared for an all-new booking by hitting the CLEAR key twice.

A Hint of the Power to Come

The fact that a large, quite complex system like this can be handled by such apparently simple programs (this is one of the most 'complicated' — the others in the system are straight single-file maintenance screens and similarly straightforward reports) is testimony to DataFlex's elegant, easy-to-use power.

More significantly, the fact that there is a large and powerful programming language ready for those who need to venture further indicates

that DataFlex should be able to handle just about any project one could dream up.

The DataFlex language has 15 command 'groups', several of which simply don't exist in other database systems. Of the groups that are common to other systems, the DataFlex command set seems noticeably richer.

For example, the DataFlex 'system group' supports file copies, renaming files, erasing files, directory listings, running an operating system-level program, obtaining the date and time from the operating system, and issuing operating system function calls.

The structured control group

includes BEGIN...END, FOR...FROM...TO, REPEAT...LOOP, REPEAT...UNTIL, and WHILE...END — you're lucky to get as much as that in many 'real' languages, let alone other database systems.

Direct console I/O commands include clearscreen, clearxy, gotoxy, inkey, input, keycheck, show and showln — all of which are 'extras' for special applications, as normal screen handling is automated by the 'forms' commands. These include accept, autopage, blankform, clearform, display, format, name (allows naming of individual windows if you prefer that to addressing them by screen-name.window-number), outfile (to redirect output to screen, printer or named file), outclose, output (sends the current screen to output device), page and print.

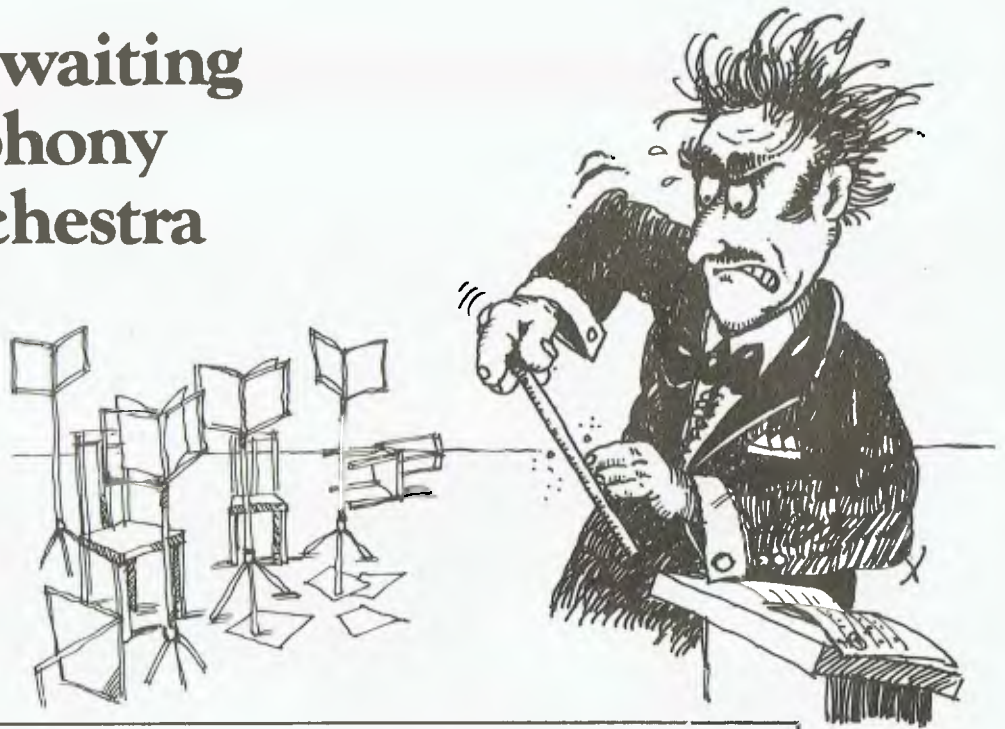
The 'control group' — commands further to the structured control group above — includes commands such as error [number] (prints that number error message from user-expandable FLEXERRS.DAT file on last screen line, clearwarning (clears error line), chain (another .FLX configuration), abort, debug, goto, gosub, on...goto, on...gosub, and return. The return statement can act as a normal subroutine return, or if specified can return to a labelled routine.

Sequential I/O commands include direct_input, direct_output (plus associated close commands), read, readln, write and writeln. String-handling commands are extensive, and include cmdline (returns the command line tail passed by the operating system when the program was first fired up), append (string concatenation), ASCII (string to number), character (number to string), left, mid and right (like BASIC's LEFT\$, MID\$ and RIGHT\$), length (of a string), pad (either fills a string with blanks to target length or, if target length is shorter, cuts it to length), pos (finds the position of one string in another), trim and upper-case.

There are several other groups of commands, for element processing (calculate, increment, moveint, movenum, movestr), multi-user commands (despool, ifchange, lock, unlock, reread), commands for use with the enter and report macros, database commands (attach, clear, delete, find, open, relate, save,

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saverecord, zerofile), key processing commands, and type definitions (date, integer, number, string, indicator).

Logical Indicators

Indicators are heavily used in DataFlex configurations to control program flow. They are, in fact, logical variables — they evaluate as either true or false. If an indicator (or combinations of indicators) is included in square brackets at the start of a program line, the line will only be executed if the indicator is true.

For example:

```
INDICATOR OWES MONEY, COUNTING
INDICATE OWES MONEY AS CUSTOMER.BALANCE GT 0
[OWES MONEY] GOSUB CHECK_CREDIT_LIMIT
// dummy example
[COUNTING] REPEAT
                INCREMENT COUNTER
                MOVE COUNTER TO WINDOW.1
[NOT KEY.ESCAPE] LOOP
```

In this case, the OWES MONEY indicator is set to true if the balance field in the customer file is greater than 0, otherwise it is set to false. The counting example is a dummy which simply serves to illustrate how indicators can be used to decide whether we enter a control structure like begin/end or repeat/loop — and whether or not we exit it. KEY.ESCAPE is one of 38 indicators DataFlex sets internally under certain circumstances; others include FOUND, FINDERR, SEQEOF, ERR, MULTIUSER (to assist developers in producing operating system independent configurations — they can ensure certain commands happen only under multi-user versions), SELECT, KEYPRESS and LASTIF.

DataFlex uses LASTIF internally in its interpretation of IF statements. For example, a program line like:

```
IF BALANCE_DUE GT 0 THEN GOSUB CREDIT_CHECK
```

would be converted to the following by the compiler:

```
INDICATE LASTIF AS BALANCE DUE GT 0
[LASTIF] GOSUB CREDIT_CHECK
```

Getting The Data Out

Reporting in DataFlex is as elegantly simple as entering data — and, thanks to its use of the same forms concepts as the entry methods, is substantially more powerful than any database report generator I've seen.

There are two ways to produce reports: directly with QUERY.CMD(.COM), or from within a DataFlex configuration, using the REPORT macro.

Query is a particularly easy way to

produce ad-hoc reports. It prompts you all the way, putting the field names on the screen for you to select from, allowing you to make the report selective, then offering a choice of indexes and a choice of subtotal breakpoints. Once it has the spec sorted out, it will let you write the report to the printer or to a file.

If you tell it to write to a file it will give you a choice of output formats. You can produce it as a standard report, output it in delimited format for importing into another database or language, or write a report configuration which can be compiled for permanent use.

If you ask it to write a report configuration, it does so using the REPORT macro format which you can then edit as required. The only problem with Query is that it will only operate on a single file — however, the report macro will operate on multiple related files so the usual process is to generate the basic format with query, then to add to it before compiling.

REPORT uses a form design format, like ENTER, so you can make multi-line, multi-file reports in a matter of minutes. Figure 5 shows a simple example REPORT configuration produced in a few seconds with Query.

The basic report has three sections — header, body, and total. It can include several breakpoints with their own subtotal format if desired.

Because the program lines simply PRINT to the data fields in the form design before each is output, you can adjust the appearance just by moving the fields around with the editor, just as if you were doing a screen design.

DataFlex 'knows' about keeping track of the various subtotals and totals (it's all in the macro), and simply outputs the header at the top of each page, then loops through the BODY routine until the page is full, a subtotal break is reached, or the data is exhausted, at which stage it prints the TOTAL form.

You can send the report to the console by specifying CON: on the command line invoking the report, or to a file by putting a filename on the command line. Otherwise, it defaults to printer output.

DataFlex Utilities — by DataFlex

Many of the useful utilities which come with DataFlex are themselves DataFlex 'configurations'. For example, the brilliant menu system is a Flex program which stores its menus in a database file.

Each record has nine menu selection lines available, with a description (the bit which appears on the menu screen), a field listing the action to be taken when that option is selected and, optionally, password and 'question' fields.

If a password is specified, you'll have to know it to be able to run

```

/HEADER
                                Big-Spending Customers
NAME                               CNAME           TOTAL PURCHASES
/BODY RESIDENT
-----
/TOTAL
TOTAL PURCHASES
RECORDS PRINTED = _____
/SELECTION
SELECT TOTAL PURCHASES GREATER THAN: _____
/*
OUTFILE
OPEN MAILLIST 1
PAGE SELECTION
ACCEPT SELECTION.1
REPORT MAILLIST BY INDEX.1
INDICATE SELECT AS MAILLIST.TOTAL_PURCHASES GT SELECTION.1
SECTION HEADER
OUTPUT HEADER
SECTION BODY
PRINT MAILLIST.NAME
PRINT MAILLIST.CNAME
PRINT MAILLIST.TOTAL_PURCHASES
OUTPUT BODY
SECTION TOTAL
SUBTOTAL BODY.3 TO TOTAL.1
PRINT RECCOUNT TO TOTAL.2
OUTPUT TOTAL
REPORTEND
ABORT
    
```

Figure 5. A simple example REPORT configuration produced easily using 'Query'.



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that selection. The optional questions allow you to obtain further details from the operator – they provide a prompt for the operator (for example, asking which device to send a report to) and accept a response, adding it to the command line in the 'action' field before passing it through for execution.

Each menu has a header, and a default menu number to return to if the operator hits the RETURN key instead of making a selection (you can make the current menu the default if you need to). If you want to chain to another menu from any of the menu selections, you simply put the command MENU (along with the menu number) in the 'action' field.

Another DataFlex configuration, MENUDEF, allows you to set up and maintain your own custom menus quickly and easily.

The READ configuration, also written in DataFlex, is a good example of the use of the language's direct I/O statements. It is a fully-prompted program devoted to reading data from text files of various formats into DataFlex databases – it doesn't actually do the READ, but generates Flex programs to do the job as required.

Machine-level utilities include programs to convert DataFlex 1.6 programs and reports to the much-changed 2.0 format (2.0d and 2.0e were the versions used for this review, incidentally), the editor, the compiler, and a reindexing program which also allows the creation of ad hoc indexes as well as providing for occasional rebuilding of on-line indexes and regular rebuilding of 'batch' indexes.

A utility program called FREL checks data integrity and puts deleted records back on the free list for re-use.

An Expandable Language

DataFlex allows you to define your own commands and macros, either individually within applications or universally, by including them in the system file FLEX.CFL, which is read by the compiler each time it does its job.

The contents of FLEX.CFL are provided in source code form in a file called FMAC, which is where you can add commands if you want them

available universally. A utility called PACK compiles FMAC to produce FLEX.CFL.

If you're really serious about using DataFlex for development, you can buy the Pascal Libraries for around \$2000.

The Ultimate Solution?

So far I've spent a lot of time telling you how good I think DataFlex is, but there are a few things I don't like.

The first is simply a petty annoyance: every program and utility in the suite automatically chains to the main program on completion, whether you want it to or not. I'd prefer to have to specify that specifically, rather than having it forced onto me all the time.

My next concern is more basic, and relates to the concept of the program rather than an individual item of behaviour. DataFlex revolves around having a record in its buffer – either FOUND, or entered. If you want to operate on an existing record, it has to be FOUND, which precludes the use of any command which operates over a range of records.

In dBase, for example, I can issue commands like DELETE NEXT 50 (records), or REPLACE ALL DATE WITH TOMORROW FOR DATE=TODAY – most dBase commands accept a scope in this fashion. I miss that with DataFlex; such operations require a program which will loop its way through the file.

The lack of any method of getting direct access to your data files is also frustrating. If you want to edit a file's contents in any way, you need a program to do it – even if it's a super-simple entry macro like the first example above. Similarly, if you want to test any DataFlex command to see how it behaves, you have to write it into a program, a time-consuming task if you don't understand the syntax and botch it a few times ...

This isn't really a criticism, I suppose – it's just a side-effect of the fact DataFlex is more like a traditional development language than most database packages.

What is worthy of criticism, I feel, is the manual. What's there is, in the latest version, clear and concise – there just isn't enough of it. It's like the first half of a top-class manual:

what it needs now is a reference section, which goes through each of the commands in alphabetical order with a detailed explanation of syntax and usage, and which shows examples in a range of applications.

Whenever I used DataFlex, I found myself continually hunting back and forth between the index and the body of the manual. The explanations of the commands are divided into their groups – a good way to introduce them to new users, but hardly a good quick-reference format.

dBase II gets a lot of criticism for its documentation, but I find its manual far more useful now that I am familiar with the program. Whenever I want to check the syntax or use of a command, I go straight to it in the alphabetically arranged reference section, the second half of the manual.

As I said, what is there is good. The new manual, provided just in time for this review by Australian Microcomputer Solutions of Geelong, seems a lot better organised, and a lot clearer in its introductory tutorial, than the previous version. And the company seems serious about continuing to improve it – a note in the front offers a 'reward' for suggestions on how to improve the documentation, a commendable approach.

Will it be the Winner?

Is DataFlex going to 'win' the great database search? It's certainly a front runner, but it's too early to say for sure. Database packages are still piling up on my desk, each with apparently valid claim to the title of dBase's successor.

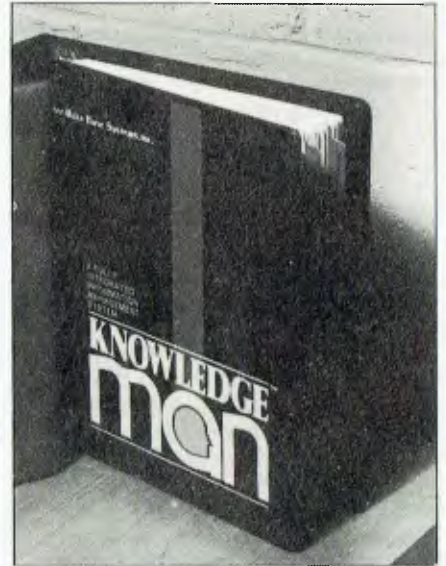
I'll reserve judgement until we've worked our way through them all, but I will say this: if there's an easier way of getting a complex, multi-file database application up and running, I've yet to see it. And its multi-user capabilities, which are also provided 'automatically' in normal use, put it a step ahead of the others at the start line.

Once you overcome the initial (self-induced) problems with DataFlex, come to understand its simple elegance and ultimate power, and approach it correctly, it is a pleasure to work with. It really is 'Application Development Software' that is easy to use – and worth using ...

Knowledgeman

REVIEWED

Rose Vines has been using dBase II for some time now, and has what she calls 'the common love/hate relationship' with it. Its programming language has many features which make it a delight to use, but it also has limitations (and bugs) which can be a real pain – resulting in programs contorted with clever tricks nested within clever tricks to get around these limits. With KnowledgeMan, Rose thinks she might finally have found a substitute for the legendary dBase II.



KNOWLEDGEMAN's specifications are enough to make a dBase II user drool. The designers have created a system in which many of the limitations are determined not by the program itself, but by the type of computer system on which it is run. Some of the features which immediately caught my eye were: unlimited tables (database files) open at any time; unlimited memory variables (with a maximum variable size of 65,535 characters); file security down to individual field level; a useful selection of numeric, string and logical functions; and an integrated spreadsheet. 'Unlimited' in this context means limited only by your hardware.

General Overview

KnowledgeMan has two levels: an interactive mode, which allows you to use features simply by typing single 'English-like' commands after the KMAN prompt, and a procedural level, where you create series of commands in a procedure file, and then run the procedure. In interactive mode it's possible to create, modify, sort, index and retrieve information in a variety of ways. The procedural level allows you to use all these commands, plus KMAN's internal programming language. In this way, it is possible to build complex systems to handle data, design customised input screens and produce reports.

I thought I might have trouble swapping from dBase II's syntax to KMAN's, but on the whole KMAN's



KNOWLEDGEMAN TECHNICAL SPECIFICATIONS

Records per table	65,535 max
Characters per record	65,535 max
Fields per record	255 max
Characters per field	65,535 max
Numerical accuracy	14 digits
Command line length	unlimited
Indexes per table	unlimited
Index key length (characters)	65,535 max
Tables open at once	unlimited
Elements per screen or printed form	unlimited
Program length (lines)	unlimited
Security code combinations	65,535 max
Rows per spreadsheet	255 max
Columns per spreadsheet	255 max
Foreground, background colours per screen form	8 max
Control breaks	65,535

(Note: Practical limits are a function of RAM size, disk storage capacity and so on.)

syntax is a comfortable and logical shorthand version of English, which is fairly easy to learn and remember. To set up a table, you type DEFINE, and then KMAN prompts you through naming the table and naming and defining fields. Fields can contain character, numeric or logical data, and it is possible to define exactly how each field will be displayed with the USING statement. There are six placeholders which determine what sort of input will be allowed:

- a – any alphabetic character
- c – any alphanumeric character
- d – any digit or sign (+ or -)
- r – any ASCII character
- l – any ASCII character (which

KMAN automatically converts to lower case)

u – any ASCII character (automatically converted to upper case)

Any other character is regarded as a literal constant, and is displayed and stored as is. An example would be:

```
FIELD? JOBCODE STR 12 USING
"Aa/dd/uu(l)r"
```

In this example, 'FIELD?' is KMAN's prompt, 'JOB-CODE' is the name of a field, 'STR' indicates that it is a character type field, and the characters enclosed in quotes indicate the type of data that may be input. When the user is inputting data, the following picture will be displayed.

```
"A / / ( )"
```

– allowing input only to where the placeholders were in the original picture, and with automatic checks to ensure that the data input matches

the USING picture.

A powerful feature is the ability to define virtual fields. A virtual field is one whose value doesn't actually exist in the table, but which is computed when KMAN retrieves the data. These fields are defined as string, numeric or logical expressions which may contain constants, variables and/or fields from the table. Say you have a table which contains the costs for various items – instead of defining an actual field for the total costs (which someone will then have to fill in manually), you can define a virtual field which will add the costs (and do any other calculations such as adding profit margins) automatically.

It is also possible at this stage to set write and read access codes for the table and individual fields. At the beginning of each session, KMAN asks the user for a valid USER NAME and PASSWORD. These can be set using the built-in USRMAN utility. Each user is also assigned read and write access codes (any combination of the letters a-p). A user is then allowed access only to those tables and fields whose read/write access codes are a subset of their own. Additionally, KMAN automatically encrypts table data, preventing casual prying eyes from examining your valuable information. This security system gives an enormous amount of flexibility, and is something which is totally lacking in dBase II.

Here's what a brief table definition session with KMAN might look like:

```
LET PROFIT = 123/100
DEFINE COSTCARD
FILE? COSTCARD.ITB READ "b-p"
WRITE "e,h,l-p"
FIELD? JOBCODE STR 12 USING
"Aa/dd/uu(l)r"
FIELD? COST1 NUM USING
"dddd.dd" READ "b-p", WRITE "o,p"
FIELD? COST2 NUM USING
"dddd.dd" READ "d-p", WRITE "p"
FIELD? JOBTOTAL NUM =
(COST1 + COST2 * 105/100) *
PROFIT USING "dddddd.dd"
FIELD? ENDDF
```

If you forget a vital field when DEFINING a table, there's no need to worry. KMAN allows you to REDEFINE any aspect of the table or its fields without destroying data already stored (as is the case with dBase II).

Once you've set up a table, records can be added using the CREATE command, and then SORTED or INDEXED. I found sorting and indexing to be quite fast, even when using multiple key fields.

When you want to retrieve stored data, there's a choice of five commands – OBTAIN, PLUCK, SELECT (also called LIST), STAT and CONVERT. OBTAIN finds a record in a specified position or a record which satisfies specific conditions. PLUCK will do the same, but works with indexed files for fast access. SELECT or LIST will display *all* records which match specified conditions, allowing you to control how the output is displayed (with the USING command), produce a sorted output table with the ORDER command, and/or control breaks to GROUP records in specified categories. There's lots of scope for producing lists in a variety of ways (including printing any output); the one thing that got on my nerves was having to type all the fields I wanted to see – even when I wanted to see every field in the table. In dBase II, 'LIST' with no operands will default to showing all fields – a shorthand version which I constantly use. There is a way around this in KMAN by using macros to store frequently used command lines, but I still found it a bore.

The final two ways of obtaining data perform special functions. CONVERT lets you store output in a file, with the choice of a number of formats, and STAT produces statistics for requested data – including mean,

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sum, standard deviation, minimum, maximum and number of observations. This is a feature I really appreciated and one that shows how much scope KnowledgeMan gives you in processing information. Also, SELECT, CONVERT and STAT can all be used with multiple tables.

In addition to getting information from tables, KMAN gives extensive information about any tables in USE (as long as you have READ access to the table and its fields) such as field names, types, access codes and pictures, expressions used to evaluate virtual fields, creation and modification of dates and lists of tables in use, including which is the current default table.

The Working Environment

At any time in a KMAN session, the user has control over a range of 'environment' variables. These can be manipulated to determine how information is stored, displayed and printed; whether statistics are automatically computed for LISTED tables; colours for spreadsheet display; bell ringing on invalid input; automatic updating of indices in USE and so on. They are all in the form 'E.XXXX', where XXXX represents up to four alphabetic characters.

For example, typing 'LET E.DECI = 3' will set the number of digits to the right of the decimal point to 3, and 'LET E.IMAC = TRUE' will suppress macro expansion. This naming convention, although succinct, may be somewhat daunting to the new user - there are fifty such environment variables waiting to be used.

Macros are another tool which can ease the workload when working with KMAN. In dBase II macros are often used to simulate arrays; in KMAN this use is unnecessary, as it has real live arrays you can use. However, macros have other vital uses. Suppose you will frequently need to use a command such as this:

```
'LIST JOBNUM, TITLE, JOBCODE,
PREPWORK, COST1, OUTWORK,
COST2, TOTAL, TAXCODE FROM
COSTCARD GROUP BY JOBCODE
ORDER BY AZ TITLE'
```

One mistake and you have to enter the whole rotten thing again!

Using the MACRO facility, you could type:

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Worst points:	No multi-user version

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

Price:	\$847 (including tax)
Review copy from:	DataBase Management Services, Suite 6, 83 Gleneira Rd, Rippontlea 3183. (03) 523-5947.

MACRO LCOST macrotext (where macrotext is the complete command line as above, and LCOST is the shorthand name I chose for the macro's name), and then each time you need to do a listing as above all you type is the macroname - in this case LCOST. What a relief!

Trial Run

In order to give KMAN a bit of real work to do, I converted part of a job costing system I've been developing in dBase II to KMAN. This is one of those systems which really *shouldn't* have been written in dBase II in the first place - the record structure requires 250 fields with 2300 characters. In dBase II I came up against just about every limit there is, and finally ended up with the record divided between nine database files. This meant that simple tasks like adding a new record to the system took minutes, because so much time was spent opening and closing files. It also considerably complicated the programming logic needed for file processing. Security for the system was very much on an ad hoc basis, due to the lack of inbuilt security facilities in dBase II.

In KMAN, everything was different - the complete record structure fitted neatly into one table (the number of fields required was actually less than in dBase, because I didn't have to have any fields purely for programming tricks, which were needed in dBase to get around its two-file limit). This made processing straightforward

throughout the program. It was also a delight to be able to use working variables with abandon - no suffocating limits to worry about. The use of GLOBAL and LOCAL variables helped to streamline the use of memory variable space and names (LOCAL macros are also allowed).

The programming language of KMAN is pretty similar to dBase II's, so for anyone with dBase experience the conversion is not too painful. Apart from similar programming structures (IF-THEN-ELSE, WHILE-DO, TEST-CASE), screen input and printed forms use familiar commands like:

```
@ 2,10 PUT JOBNUM
@ 3,10 GET JOBCODE
```

There is no utility such as dBase's ZIP, which assists in screen design, incorporated into KMAN; however, there is a separately available product, KPaint, which can be integrated with KMAN and which automates this process and relieves the tedium of writing dozens of PUTs and GETs. You can set up your forms with a variety of special effects (if your terminal permits), including different screen colours, blinking fields, reverse video, invisible entry (which prevents data from being displayed as it is input) and warning bells on specified fields.

On the whole, KMAN's scope and power made programming quite enjoyable. The diagnostic messages were usually a little less cryptic than dBase's, but the debugging tools weren't as good.

More Power

I didn't spend much time with KMAN's inbuilt spreadsheet, but it certainly seemed impressive, with up to 255 rows by 255 columns, and KMAN's programming language available for cell definition. This means that you can use IF-THEN-ELSE, WHILE-DO and other programming structures when setting up cell formulae.

Information from database tables is usable in the spreadsheets and vice versa, and it is easy to move from database to 'CALC' processing and back.

This combination of database/spreadsheet makes KMAN a very powerful package. In addition, it is possible to buy other modules which can be integrated with KMAN: the above-mentioned KPaint (an interactive form generator) and KGraph are available now; KText (a text processor) is scheduled for release in September. These modules allow you to perform further functions from *within* KMAN.

For example, with KText you will be able (amongst other things) to test and modify procedure files without having to constantly exit and return to the operating system. Thank goodness.

Documentation

Very few programmers seem to enjoy the task of documenting their programs. Although quite happy to devote endless hours to ensuring that they have found the neatest solution to a programming problem, every minute spent on documentation is begrudged.

All too often, this dismal tradition is reflected in the manuals which accompany commercially produced software, and it can drive you nuts. At times I've had to use 500-600 page COBOL reference manuals with *no* index. In a mainframe environment, there are usually other resources to overcome these deficiencies; with micros, the documentation is often the only support you have, so it needs to be good.

I've no complaints about the general design and indexing of KnowledgeMan's documentation, but the company's claim that KMAN is "easy to get to know" is true only on the most superficial level. KMAN's documentation comes in two parts — a beginner's guide and a reference

The reference manual's introduction of spreadsheets (underneath), compared with the 'cutesy' approach of the beginners' guide.

IX. HOW TO CONSTRUCT AND USE SPREADSHEETS

KnowledgeMan provides a command for entering the spreadsheet mode of information processing. When you are in the spreadsheet mode you can execute any of the KnowledgeMan commands described in other chapters by prefacing that command with a backslash (\) symbol. There are two exceptions: BYE and STOP. When these are prefaced by a backslash, they have a different meaning as described in this chapter. Beyond these normal KnowledgeMan commands, there are several special commands that are pertinent to spreadsheet processing within the spreadsheet mode. Each of these commands can be used only within the spreadsheet mode. If you are in the normal mode, use the value of E.SCMD instead of a \ while in a spreadsheet command.

Spreadsheet commands:

- CALC enter spreadsheet
- \SAVE save a content
- \LOAD load a content
- \WIDTH specify a width
- \COMPUTE compute up to
- \= reposition
- \PROTECT protect content
- \UNPROTECT unprotect content
- \EDIT edit the content
- \UNDEFINE undefine content
- \USING assign
- \STYLE declare
- \ACTIVATE content
- \DEACTIVATE content
- \COPY copy
- \COMBINE combine
- \COLUMN a column
- \ROW a row
- \BORDER border
- \DISPLAY display
- \CONCAL calculate
- \REVEAL reveal
- \DUMP dump
- \STOP stop
- \BYE bye

What is a spreadsheet?

A spreadsheet is a table of numbers 1, 2, 3, ... Z, AA, AB, ... ZZ, and so on. The width of the table is the number of columns, and the height is the number of rows. The table has row borders and column borders.

```

1- :A 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

```

SPREADSHEET ANALYSIS

III. SPREADSHEET ANALYSIS

A. Introducing Spreadsheets

What is a spreadsheet?

A spreadsheet is a worksheet that makes it easy for people to work with numbers. (Spreadsheets often contain words, also.) Why not take a look at a spreadsheet right now? KnowledgeMan has one ready for you.

But didn't I leave KnowledgeMan when I entered BYE at the DATA MANAGEMENT?

You're right. Start another session now by entering KnowledgeMan. Enter:

```

KMAN
KNOWLEDGEMASTER
MDBS

```

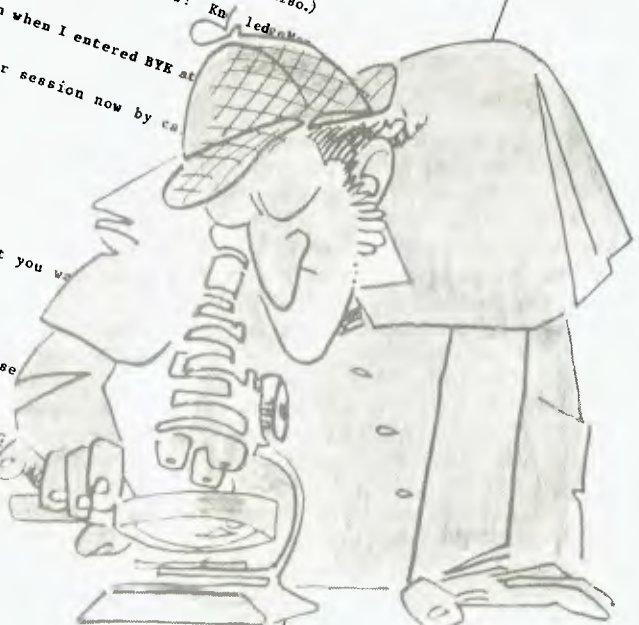
Then, just tell KnowledgeMan that you want spreadsheets. Enter:

```

_CALC

```

Notice the change in your screen. (Those spreadsheets are for the dramatic.)



manual. The beginner's guide is certainly easy to read and assumes very little knowledge on the part of the user, but its *style* is awful. It seems the authors are unable to get down to basics without being cutesy-pie and patronising.

The 'business end' of the documentation – the reference manual – abandons the tone of the beginner's guide. Allowance has been made for beginning, intermediate and advanced users, but there is quite a gap between the user's guide and the 'easy' sections of the manual. Due to the power of the system there's a lot of information to be absorbed, and at times I felt I was sinking under the technical barrage. The reference manual is really a user's guide/reference manual combined, which is its downfall. Hopefully, if there are future editions, these two functions will be split so that there is less clutter and more clarity. In any case, be prepared for some hard slogging to go beyond the absolute basics with KMAN.

Conclusions

I think KnowledgeMan is a great package. I came to it with all the prejudices and preferences of a confirmed dBase II user, along with a lengthy 'wish list' of things I've been yearning for. It answers many of my needs, and the things I don't like about it are not critical faults: the lack of a shorthand LIST command; an inconsistency in syntax when having to specify which file to use in a command (sometimes you don't have to name the table if it's the default table – KMAN will make that assumption for you – other times you do); the lack of a multi-user version (multi-using would make it almost an ideal system – although for some users this will be an irrelevant consideration); and the manual could be improved.

Perhaps one of the dangers with a system as powerful as this is that it can lead you into profligate use of memory space. The program uses a lot of space as it is, so if you're

going to get the most out of KMAN you'll need a hard disk and a heap of internal memory. The program is slowed a bit because it is frequently moving overlay files in and out of memory; depending on the amount of internal memory available to you, you can use the supplied MOMAN utility to merge some of these overlay files so they are resident in main memory all the time.

What's it going to cost? KnowledgeMan itself will set you back \$847 (including tax). If you want the optional KPaint, KText or KGraph they'll cost you another \$260 or so for the first two and \$447 for KGraph. It's not peanuts, but you get a lot for your money (although I reserve my judgment on the options, as I haven't had a chance to use any of them).

If you have that sort of money and the appropriate hardware and you're looking for a database and/or spreadsheet, give KnowledgeMan a try. I think you'll be impressed.

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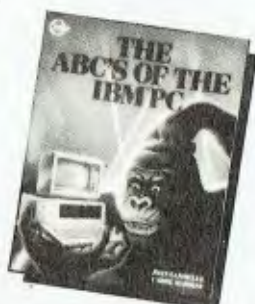
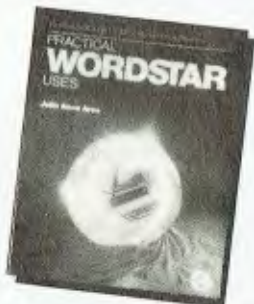
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The Prize: KnowledgeMan KPaint KGraph

The Prize

As you'll have seen from our review, KnowledgeMan is a powerful database package containing many of the features on the average dBase II user's 'wish list'. It runs on most computers using PC-DOS, MS-DOS or CP/M-86, with a minimum RAM of 192K and two 500K disk drives. In fact, most of KnowledgeMan's limitations come from the machine on which it is run, not the program's own innate limits; as our reviewer said, its specifications are "enough to make a dBase user drool".

KPaint integrates with KnowledgeMan to automate the process of screen and form design. Using KPaint you can set up your forms with a variety of special effects (your terminal permitting), including different screen colours, blinking fields, reverse video, invisible entry (which prevents data from being displayed as it is input) and warning bells on specified fields.

KGraph allows the production of high-resolution colour graphics with KnowledgeMan; you don't even need to exit from the spreadsheet to produce a graph. KGraph can produce bar graphs (clustered, stacked and three-dimensional), scatter diagrams, line graphs, area plots, pie charts and high-low-close graphs. It also enables the user to draw free-form diagrams, and symbols, logos or pictograms can be incorporated into the graphics. Split-screen graphing is supported, with up to four graphs appearing simultaneously on a single screen.

These three modules are all being presented to the winner by Micro Data Base Systems of Prahran, Victoria, with the aim of inspiring creative interest in the wider use of database management programs, be it in business, education or simply for fun.

Closing date for entries is October 31, 1984; entries received within seven days of that date will be accepted if postmarked on or before October 31, 1984.

You've read the excellent review of KnowledgeMan in this month's *Your Computer* — now you can win a copy of this database management program for your own use, plus two additional modules to help you use it to its fullest extent: KPaint and KGraph. The value of this prize is over \$1000!

To win this great prize, you have to put your creative mind to work. We want to hear about your ideas for an interesting and innovative use for a database management program. It needn't necessarily be a serious business application; as long your idea is both novel and useful, we're interested in hearing about it.

When you've worked out your database application, write an outline of its use and purpose, clearly set out in, say, a one-or-two-page document, and send it to us. Our panel of judges, which includes Matt Whelan, former Managing Editor of this magazine and chief arbiter in the Great Database Search, and a member of staff of Micro Data Base Systems, the company providing the prize for this competition, will evaluate all the entries and pick the most innovative and interesting application as the winner.

The competition will run in *Your Computer* for two months, September and October 1984, and we'll announce the name of the winner and the nature of the winning application in our January 1985 issue. The winner will be notified as soon as the judges make their decision.

Please fill in the attached coupon and send it with your entry to: **Your Computer 'Database Applications Competition', PO Box 227, Waterloo NSW 2017.**

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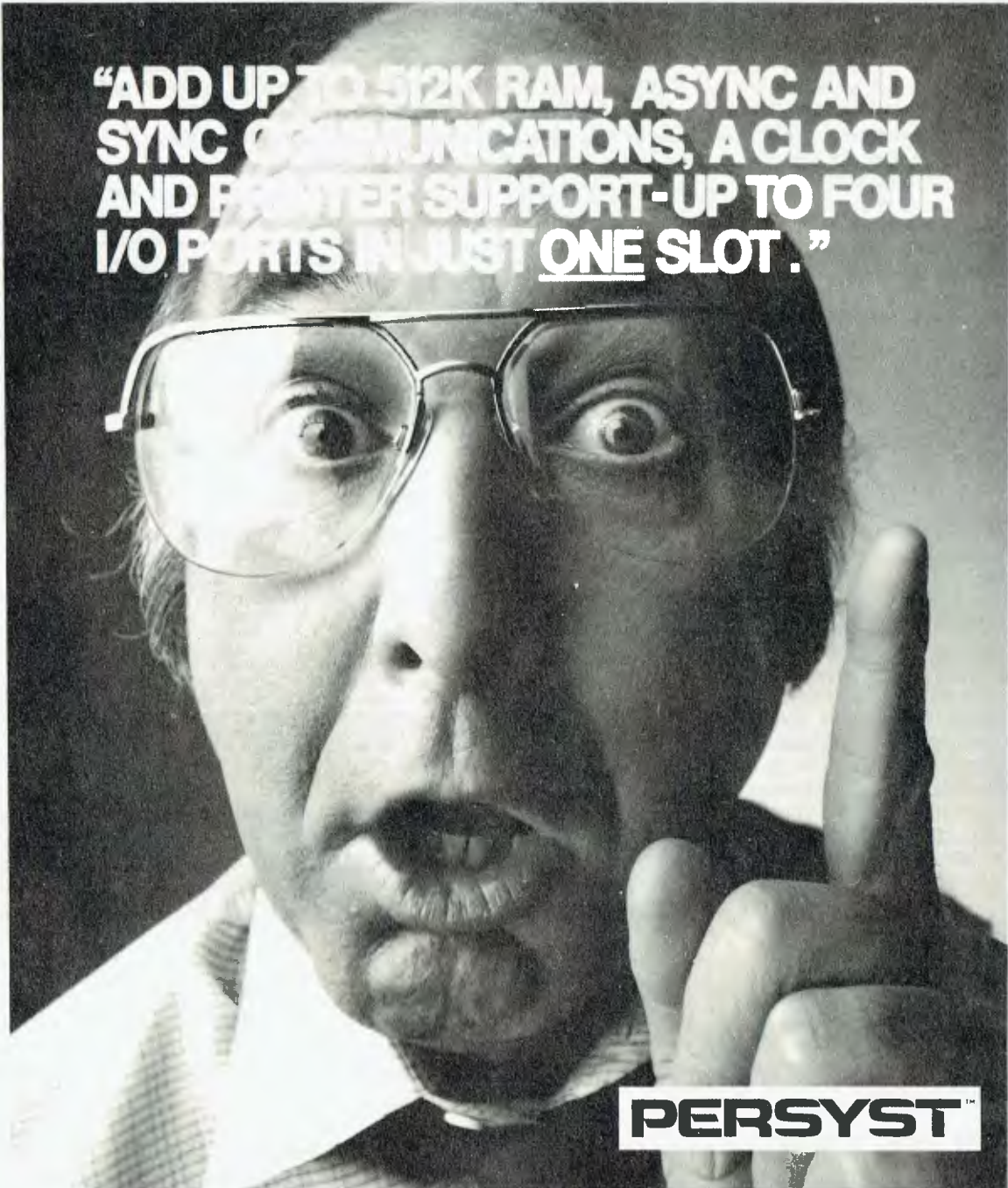
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Australia is far behind other western countries in computer policy – and is in danger of slipping further toward the back of the field. This is the view of University of New South Wales Emeritus Professor A.H. Willis, who recently completed a major Commonwealth Government study on the impact of technology on teaching. Here he discusses his findings.

Teachers: Must they be Computer-illiterates?

"WE DON'T have a national computer policy in this country," says Al Willis, "and even State policies vary widely – with New South Wales and Queensland the most backward."

It is an opinion shared by many experts and laymen alike (Willis says of himself: "For a layman, I am an expert"). And on the face of it, the Willis argument runs along the lines which are becoming familiar to most Australians.

He says, "We are damn good at a lot of things – we make fine mathematicians and astronomers. But we aren't damn good at manufacturing, that's for sure. There aren't enough of us and we haven't got enough of a market. Meanwhile computer science experts are making out a very convincing case that we can sell software."

Professor Willis, though, is not one of the increasingly vocal merchants of sexy hi-tech who want to build Australian Silicon Valleys.

Computer Science As a Service Industry

He would like to see the country earning foreign exchange from high technology, certainly. But first he wants the vast potential of computer science to be realised in Australia as a service industry – especially to education.

That requires, he argues, a strenuous campaign for computer

literacy – nowhere more urgently than within the educational system itself. In an age where most primary school children have some access to computers, there are thousands of teachers who are less computer literate than their eight-year-old pupils.

"There are lots of bright kids whose fathers have a computer at home, perhaps bought by the company," he says, "Daddy brings home a floppy disk, not a tile, and works on some problem. And of

course the kid gets to play with the computer, using sophisticated software. Children like that are giving teachers terrible inferiority complexes."

More Technical Expertise Necessary

In universities, departments which could and should be using computers routinely are failing to use them at all or are having to make decisions about hardware and software which their staff are not qualified to make.



EDUCATION

"I would like to see much more technical expertise available – I mean technical in the narrowest sense," says Willis. "As it is now, if you are the Professor of Latin or something and anything goes wrong in the language lab, you are completely in the hands of a technician brought in from outside. Or suppose you want to

"After all, it's virtually impossible to fire an academic with tenure, unless he seduces a student in broad daylight. And then there are the students wanting \$50,000 worth of books, the staff association wanting higher salaries – everybody wants something. But if the Vice-Chancellor can say 'this money is from the

received and is being reprinted.

Says Willis, "I formed my views as I went around, and did a great deal of reading. I did rather a superficial survey of the whole field. I think that's why it was successful, because there are an awful lot of people who want a superficial view. Some of the specialists have probably got a touch of tunnel vision."

Tools of the Trade

Al Willis remains, above all, a teacher by temperament and training. And if his latest work in high technology has convinced him of the urgent need for the introduction of more computerised tools, he never thinks of them as anything but just that.

"Computers themselves haven't revolutionised teaching – only some of the techniques," he says. "Why should we expect computers to do anything dramatic for teaching when lots of teachers won't even go to the trouble of making decent slides?"

And he dismisses the idea that computers can actually discourage students from using their own intellectual capacities.

"There are an awful lot of dumb bunnies in the world. They get along, and they make good fathers and mothers. But they can't add up well, and they never could, even before computers came on the scene."

Conversely, he says, neither computers nor anything else "can keep a good mind captive".

His interest – and indeed his faith – in people and their capacity for excellence may have been bred in the Portsmouth dockyard where he was apprenticed before World War II. "It was," he says, "a hard gutsy area where everybody was a damn good engineer."

Perhaps as a result, he has scant respect for sacred cows. One of the reasons he left Britain in 1950, he says, was his growing disenchantment with a system which seemed to imagine that men could only become leaders in the engineering industry "if they had graduated in Greats from Oxford."

It is to be expected, then, that the computer holds no mystique for him: it is an instrument for making life easier and work more efficient, and it can and should be mastered.

This article is reprinted with kind permission from Volume 1 (1984) of 'Alumni Papers', the publication of the University of New South Wales Alumni Association.



At Thornleigh West Primary School in NSW, work for the first term on eight networked Commodore 64s has been so impressive that co-ordinator Ian Wallace would welcome interested educators to inspect the system.

link up with another system – you aren't qualified to make a decision on that."

It is evident, he says, that teachers at many levels recognise this deficiency in their training all too clearly. Often they try to remedy it themselves – but they rarely get much help.

"Take Macquarie University, which is a teachers' university as much as any in Australia. A handful of staff got together and scrounged money for some micros – and it's peanuts in terms of the purchase price of a decent polarising microscope, for example. They put on a computer course for primary teachers in the evenings, against the most appalling odds. And they were besieged."

There is much, says Willis, that can be done with a little imagination and money.

Bring in the Money – Earmarked

"The Government has got to inject money – get computers into schools, start special training programmes, earmark dollars to departments of computer science."

This last is particularly important, thinks Willis. Vice-Chancellors are under such enormous pressure from staff and students alike that unless funds are ear-marked, there is a danger of them failing to reach the area of greatest need.

Government and it's computer money ...

"Then pull the teachers in for four weeks, and give the States funds for casual teachers to fill in while they are there. In four weeks they could get to the stage where they would be self-learners."

Universities and Colleges of Advanced Education should be equipped to hold computer courses and given grants toward them.

Centralisation – For Expert Staff

Willis thinks other advances might be made by greater centralisation of computer expertise.

"Universities don't like centralisation, but when you've got it you can have a lot of really good technical staff who know what computers are, know what the next generation is going to be, and know what's worth waiting for – and this kind of knowledge is terribly lacking at present, except in the Schools of Physics and Computer Science."

Willis speaks on the subject with the fervour of the new convert; though as a Professor of Engineering until retirement in 1978 he had plenty of contact with high technology and teaching at the request of the Commonwealth Tertiary Education Commission.

His paper, 'The Impact of Technology on the Teaching Process in Australian Universities' was well

IN PROVO, Utah, an aspiring author sits at her computer terminal working on her latest short story. The microcomputer has made writing much easier, she says. "But although she did have some initial difficulty mastering the technology.

"In kindergarten, I wasn't really sure if I liked using the computer," she says. "But since I'm in first grade, I've really started getting good at it." The author, six-year-old Melissa Leigh Smith, pushes a button, darts across the room and retrieves a green-and-white printout of her story, 'Too Much Parrot Talk'.

Miss Smith attends the Waterford School, which was created in 1980 by Wicat Systems Inc to test computer products and computerised education. About 250 students, in first through to ninth grade, spend an hour a day at computers. Even kindergarteners use the machines twice a week, learning the jumbled sequence of the letters on the keys at about the same time as they're learning the alphabet.

Parents' Concerns

Nationwide, an estimated \$450 million worth of computers will be sold to elementary and secondary schools in 1984, and that market is expected to balloon as more and more parents insist that their children be included in the computer revolution. Computer companies are vying with each other for the children's market.

Apple Computer Inc, for example, has donated thousands of computers to schools, and is pitching an ad campaign directly at children. International Business Machines Corp has begun to stress educational software for children to increase sales of the PCjr, which hasn't lived up to IBM's expectations. But only Wicat, based in Orem, Utah, has created access to a full-time, private school where it can try out its software and hardware.

The school was the idea of a group of educators who in 1977 had founded Wicat, a non-profit research group studying ways in which technology could improve teaching. In 1980, the educators decided to set themselves up in business, forming Wicat Systems to produce software and computers. The school was created at about the same time, as a non-profit organisation supported by private contributions. Since the company went public, it hasn't posted a profit.

Waterford is closely tied to Wicat. Its headmistress, Nancy Heuston, is the wife of Wicat's chairman, Dustin Heuston. The company contracts with the school to have the students give its software trial runs. And the school is Wicat's single largest shareholder, owning about 20 per cent of its 20 million shares outstanding.

The work goes on in a one-story brick building that was once a Catholic school, located at the base of a snow-capped mountain. Hallways inside are cluttered with baseball jackets, knapsacks and

From the US, the land of many amazing happenings, comes this rather amazing story. We found it in 'The Asian Wall Street Journal' and were somewhat taken aback by the audacity of the tale. In theory, the users of any product should be the ideal evaluators of that product; but when the product is educational software and the testers are children, and the children attend a school run by the software company, and the school's headmistress is married to the chairman of the company ...

R&D in the Kindergarten

'Return of the Jedi' lunchboxes. In the music room, a piano plunks out 'The Farmer in the Dell'. Across the hall in the computer room, a printer spits out word processing assignments.

Not everything is electronic. When the computer poses addition problems, some children figure them out with a pencil and scratch paper; others count on their fingers. One boy punches in a correct answer, and the computer generates a smiling face. His next answer is wrong, so he gets an 'X' and sticks his tongue out at the computer.

The children, many of whose parents work for Wicat, seem proud of their work. "You might get sick of doing the test over and over, but we're the first ones to use it, so we have to make sure the bugs are out," says 11-year-old Clark Newell. "We have to make sure it's a good program so it can go on the market."

"Too Gross"

Students also evaluate the content of programs which are offered in a variety of subjects, from typing and maths to civics. "Sometimes the stories are too gross, and we tell them they should take them out of the system," says fifth grader Leslee Preator. Another classmate complains, "In some programs, we're supposed to argue politics with the computer, but we get bored. We don't want to be bugged about politics and stuff like that."

Most students, especially the youngest ones, don't seem to find learning about computers any more difficult than learning anything else.

School officials say the computers improve the student's test scores. But whatever academic success the children achieve may also be a result of the small classes (25 students in each) and the

school's experimental aspect, which encourages students to work. The laboratory atmosphere isn't right for everyone. Les and Elaine Smith, for example, have two sons at Waterford, and they are aware of its shortcomings as well as its strengths. Their older son enjoys the school and does well, they say, but their younger boy is returning to public school next year. "There's definitely a lot of pressure," says Mr Smith. "They're expected to perform, and if they can't keep up - there's frustration."

A Successful Wedding?

Mrs Heuston, Waterford's headmistress, says the teaching staff is determined not to sacrifice the students to the experiment. "Our real concern is education," she says, "but the only way things are going to happen is if the company succeeds. We have to have a wedding of industry to education."

It remains to be seen how successful the wedding will be. Its first year as a public company ended on March 31, and Wicat expects to post a loss of about \$13 million on revenue of about \$23 million for the period. Its stock has tumbled to about \$3 a share from an initial price of \$18, and class-action suits have been filed charging the company was misleading in its prospectus. (Wicat says the claims are without merit.)

Wicat also sells systems to businesses and government, often for use in training programs. But the company thinks its strength is its software programs, developed at a cost of about \$1 million each. The programs cover a full school year's worth of basic subjects for several grades - and have also, of course, been tested by the pre-pubescent experts at Waterford School. □



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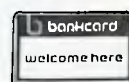
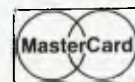
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Because of cultural differences, Aboriginal children have often been disadvantaged when learning under our school systems.

The introduction of computers into Northern Territory schools seems to have overcome many of these problems.

Breaching Cultural Barriers

ALICURUNG is one of a tiny handful of schools in Australia where pupils have actually broken into classrooms after hours to continue work on computerised education programs.

A school in which most of the pupils are Aboriginal, Alicurung is situated at the remote 600-person Warrabri Settlement – some 380 km north of Alice Springs, 180 km south of Tennant Creek, and 21 km off the main road.

The key to the enthusiasm of many Aboriginal and white children at the school has been the introduction of computers – mostly Apple II series personal computers – into some classes. In the last twelve months, such computerisation has revealed new possibilities in helping to overcome some of the cultural differences faced by educators in outback schools.

The preliminary Alicurung findings are likely to be tested at many rural schools in the Northern Territory, where an intensely computer-conscious Department of Education has installed personal computer equipment in all secondary schools.

The department is now seeking to double its school computer coverage within the next 12 months, and departmental computer specialists have already completed around 55 in-service courses for Northern Territory teachers during the first semester in 1984.

At Alicurung, and other major Aboriginal schools such as Yirrakala, near Gove on the Gulf of Carpentaria, teachers continue to gradually probe for the limitations of the new technology classrooms. Educators are now pushing for Commonwealth funding of a major pilot study to verify the

observed improvements in pupil responsiveness, literacy and mathematics skills that are apparently attributable to the recently-installed computers.

Some senior Aboriginal students at Alicurung have developed programming capabilities in BASIC; some disadvantaged high school students have for the first time successfully acquired basic mathematics skills. Chris Knott, the school principal, worries about the security of the Apple educational equipment in a situation where well-meaning pupils have already broken into classrooms to continue work on the educational programs after school hours.

The Importance of Visual Teaching

According to Chris Knott, major factors in the success of the computer classroom are the visual emphasis of computer applications in teaching, and the highly personal interaction between individual pupils and the learning program on the terminal.

"Aboriginal children in particular are highly visual learners," he said. "New teachers in this region quickly learn there's no point in talking at the class, without taking other cultural factors into consideration."

The principal of Yirrakala school, Owen Faust, says the same education



A Year 10 student works on an Apple IIe at a Northern Territory high school.

EDUCATION

film materials can often be utilised repetitively with beneficial results in classes of Aboriginal students.

Similarly, the computers, with their potential for infinite replays of 'see and do' instructional programs, also appeal to the students' fascination with visual media, and relate closely to traditional tribal teaching methods. The results of this appear to be considerable increases in literacy and maths skills.

Peer Group Pressure Relieved

An important factor in the retardation of individual learning achievement in outback schools, claims Chris Knott, is the peer group pressure within Aboriginal society, which, in an open classroom situation, inhibits children from competing with each other and from attaining levels of academic performance that might elevate them above their peers.

Both adults and children can be subjected to alienation within the community if they resist peer group pressure to conform, although the pressure is markedly less on girl students.

Aboriginal society is oriented toward group achievement, says Knott, and the individualism inherent in the standard Australian education system is not valued in the same way.

"Part of the solution computer-assisted teaching appears to provide lies in the removal of the public performance elements of classroom teaching," he claims.

"Students at any level interact on a private, purely individual basis with

the teaching program. The limit then lies only at the boundaries of the student's ability and interest."

Computer Skills are Easily Acquired

At Alicurung, a 25-member class of Year 4 and 5 students takes about a week to acquire computer operating skills, with children helping each other over the initial hurdles.

Using an introductory program such as 'Apple Presents Apple', some enthusiastic students rapidly improve basic literacy skills in their eagerness to read and respond to the computer instructions.

Under European methods of teaching the simple mathematics skills needed for survival in contemporary Australian life, many Aboriginal students have become resistant to the learning process in their early teens, by which time their lifestyle may have resulted in absences from school of up to five years in an eight-year period.

Embarrassment and peer pressure lead to student protestations that they are 'too old' to learn basic mathematics. However, the methodology, privacy and appeal of well-developed mathematics teaching programs adapt so well to the situation that within ten weeks the students move from partial ignorance of basic mathematical fact to almost 100 per cent recall.

Research Required

The considerable apparent improvements in learning related to computers are being treated cautiously by

teachers, largely because the potential appears so great in basic areas of learning.

"We'd like to know a lot more about the entire phenomenon," says Chris Knott, who hopes to see a teachers' in-service computer training facility set up at Alicurung.

"Before large amounts of money are invested, we believe a scientifically controlled pilot programme should be set up to monitor and analyse methods of using computers, and the results we seem to be getting from the computers and programs. We also want a classroom networking system as soon as possible," Chris Knott affirms, "so computers can be fully tested and researched in the classroom situation."

In the meantime, the frontier schools and their teachers learn about computers from day to day, with teachers first teaching themselves and then applying the programs in the classroom.

"Quite often no research is done into the effects of educational equipment, procedures and theories," Chris Knott says. "And considerable sums of money can be wasted before research is eventually set up and carried out."

"Our initial experience with computers in the classroom in our Aboriginal school has impressed us with the need for such research."

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Close-up on the Action

If you read our excerpt from the Schools' Commission Report in last month's 'Your Computer', you'll no doubt have been dazed by the diversity of departments, delegations and divisions appointed to administrate the dissemination of computers and computer knowledge in Australian schools. En masse, they seem a rather impersonal bunch, surrounded by a sticky accumulation of red tape, but at the heart of these organisations are many dedicated people, themselves sometimes stymied by the governmental hodge-podge. Natalie Filatoff found out what one such group actually does.

THE Computer Education Unit of New South Wales occupies part of a two-storey brick building in the grounds of Erskineville Public School in Sydney. The school-administration-block smell of overworked photocopiers dominates the internal air space, and in a number of back rooms, computers dwell, according to brand, each make in its own classroom-like accommodation.

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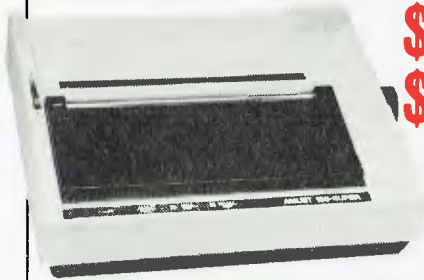
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The Unit has a professional staff of five, one of whom does not exist, and three ancillary staff. The four professional staff who do exist are all teachers who have been taken from different subject areas to spend up to four years working on curriculum development for computer courses, conducting in-service computer courses for other teachers, and providing information, advice and assistance to schools, regional centres, professional and community groups. The intriguing non-existent member of the group is the Officer-in-Charge, who was real at one time, but has gone away, who may be replaced, but in the meantime exists in spirit.

According to Paul Jenner, one of the existent four and a maths teacher self-taught in the ways of computers, there are two major things happening at a state level at the moment: "First, the syllabus committee which was formed by the Secondary Schools Board in 1982 is working on two syllabuses. One is for a computer awareness course, which looks like it will probably be ready for the beginning of next year."

The staff of the Computer Education Unit is on the syllabus committee and has been working on the computer awareness course syllabus since July 1983. The course, which is intended for students working towards the School Certificate, was expected to be complete by September 1983. However, such a draft course proved difficult to prepare in time for trials in 1984, and is now anticipated to be ready for optional implementation in 1985. To give schools some direction while they wait for the formal syllabus, the committee has circulated a statement of intent which outlines the course and its objectives. The following are excerpts from that statement:

"The proposed course is not concerned with the teaching of computer programming ... 'Computer Awareness' is concerned with knowledge and understanding of the use of computers and computer-related technologies in a social context relevant to all students.

"The Board has given priority to the development of a computer awareness course, but proposes to design a separate elective course in 'Computing Studies' in the Junior Secondary School, at a later date.

"As familiarity with computers and information technology becomes more commonplace, a computer awareness course, as envisaged now, may become unnecessary or may change

The States that have got it together ...

APART FROM a mention in our 'State Round-Up' last month, we haven't said much so far about the two states in Australia which have actually managed to rise above the morass of confusion and red tape and really *do* something about computers in schools: South Australia and Tasmania.

Both states have opted for a centralised solution to the difficulties of both supplying and using computer power in schools. South Australia has its Angle Park Computing Centre to oversee both the practical side of things and teacher training, while Tasmania's Elizabeth Computing Centre is the focus for the computing activities of that state's government schools.

South Australia

Apart from being centralised, however, the two systems differ considerably in operation. Angle Park runs two extensive microcomputer networks, to which the state's schools have access via networking, and also provides a batch card input system which

enables pupils to try out their own programs without tying up expensive and scarce memory time.

The Schools Computing Section at Angle Park provides schools with advice on all aspects of computing in schools, as well as developing courseware in-house and conducting courses for the state's teachers. Angle Park has eight full-time professional staff plus four support staff.

South Australia already has two computing courses operating in its schools: Computer Awareness and Computer Studies. In addition, a Computing Curriculum Committee advises schools on the general content and development of these courses, so that, in theory at least, the courses offered should be in step with the state of the art in the real world. As well as these courses directly concerned with computing, the Education Department is looking to implement computing applications in as many other curriculum areas as is feasible, beginning in secondary schools but with growing

concern with primary education.

Around 90 per cent of secondary schools already offer all or part of the recommended Computer Awareness course somewhere in years 8-10, while Computer Studies courses are available in years 8-12. In the schools themselves, teachers are making every effort to integrate computing into the whole curriculum, and teaching with computers occurs to some degree in all subject areas - limited by the availability of software and access to hardware.

It is claimed that 95 per cent of secondary schools and 20 per cent of primary schools have at least one microcomputer. Thirty or more schools have installed a local area network with an average of eleven microcomputers in each network, which provides great opportunities for interactive work by both teachers with classes and students on their own initiative.

Angle Park also has a database system to which the state schools have access, which helps with

dramatically in content and extent."

The stated general aims of the computer awareness course include the fostering of:

- An awareness of present and future applications of computer technology.
- An understanding that many technological changes in the past have brought about major societal changes as far-reaching as those which computer technology is now bringing about.
- An awareness that *people* develop technology and determine its applications.
- An awareness of situations in which it is appropriate to use a computer to solve a problem and where it is not.
- An awareness of how computers are given instructions and a functional understanding of how computers work.

- An awareness of the opportunities provided by computers and computer-related technologies for the improvement of the quality of life.
- An understanding of the meaning and interpretation of common technical words and phrases associated with computer technology.

Says Jenner, "No decision has been made about whether it will be a compulsory course. Even if it had been, because of the laid-down guidelines about optional implementation of any new syllabus, that can't happen for a couple of years anyhow."

Work on the elective course in computer studies mentioned above is only just beginning. Development of a computing course to be part of the Higher School Certificate has also been slow. Although the Board of Senior School Studies has approved many computer-related courses as

school scheduling tasks and other curriculum support; several schools also use microcomputers as an administrative aid.

Finally, a special-purpose microcomputer has been developed by the Special Education Section of the Education Department for use by severely handicapped children.

Tasmania

The Elizabeth Computing Centre in Tasmania, the source of all government schools computing activity in this state, evolved along different lines from Angle Park. Its network (TASNET) isn't made up of micros but rather of minicomputers, which support around 330 terminals in schools, colleges and other sites throughout the state.

The Higher School Certificate in Computing Studies has been available for eleven years (NSW, eat your heart out!), and students on this course would normally use the TASNET system. However, many schools also have micros installed, and the ECC loans microcomputers to schools to supplement this equipment. This

means that all schools have access to interactive computing equipment through TASNET, microcomputers or both, and the terminals are used for a variety of activities including library functions, bookings for audio-visual equipment and school administration.

As well as these administrative functions, school micros are used to support computer literacy courses and for any curriculum activities involving teaching with or through computers. The emphasis of the computer literacy courses is usually on social implications and hands-on experience, aimed at giving students familiarity with the use of software packages rather than actual programming or other 'hard' computing knowledge.

The ECC has a total staff of 22, and provides advice to schools, develops software both for education and administration, and maintains and develops the network to which the schools have access. As an example of the material produced by the Centre, in 1982 the

group produced a First Fleet microcomputer package for distribution to Australian schools as part of Information Technology Week. The Department of Science and Technology has sponsored the Centre to develop a similar package based on data collected during an Antarctic expedition.

In primary schools the emphasis is on computer-assisted learning, computer awareness and problem solving. In addition, seven special schools have microcomputers, but there is still not a wide enough variety of software available in this area.

So, in case you had the idea that the entire area of computers in education in Australia was a shambles, at least two states provide an exception. Whether the same solutions would be workable in the other states is of course open to debate, but no one could argue that by getting their act together early, South Australia and Tasmania have given their children a real head start in the modern information-based world. □

'other approved studies' since 1979, it has only recently decided to establish a group to advise it on the role of computer studies courses in the senior curriculum.

Second Project

"The other main thing which is happening at a central level," says Jenner, "is the development of curriculum project teams. Here at the unit we're a part of the Division of Services within the Education Department. The Division of Services mostly has to do with professional in-service development for teachers, materials evaluation and materials development. We also have the role which normally comes under another division called the Directorate of Studies. So, in a nutshell, our role has something to do with every part of computer education in New South Wales government schools."

That's a somewhat crowded, departmentalised, jargon-filled nutshell, but more concrete and understandable things are being achieved.

For example, a handbook on software evaluation and procedures is nearing completion, which will be used to evaluate educational software. The results of these evaluations will be made available to schools as an aid for the selection of software appropriate to individual school needs.

A regular newsletter is produced by the unit, and distributed to all New South Wales Schools. It contains information about current developments in computer education, new equipment, software and teaching materials.

It is also intended that an Information Bank will be created, to act as a reference source for teaching materials, software lists and evaluation reports, and other more general reference material.

In its capacity as an in-service training facility the halls of the unit building rarely reverberate with the happy sound of teachers stampeding in to how-to computer workshops. Rather, says Jenner, "The gear gets bundled into station wagons and taken out to schools or various motels around the place, because we do most of our in-service work in the field. Such courses are usually run by the regions or somebody in the region, and we are invited to bring the equipment along and advise or instruct."

He elaborates: "New South Wales is divided into ten educational regions; each region has at least one computer education consultant. We're the first line of contact with schools. So, at the moment there are about 20 people around the state, including the staff here (of five, remember?)."

Another interesting aspect of the computer education scene in New South Wales is what Jenner described as the "programme for girls". He says, "The Department is very much aware of the problems that girls have with sexist education in general. Traditionally there's been a problem with girls doing things like maths and science — they tend to drop out, especially at the senior level. To a certain extent, computer studies have been linked with mathematics, which seems to be having an effect on the way girls think of it. There's already some indication that girls are less enthusiastic about computers than boys. Their participation rates are lower. They are less comfortable about using a computer than boys are. They spend less time in their lunchtimes and so on going to the computer room — and we're well aware of it. Because it's a new area, we're very much aware that we have the opportunity not to foul it up. If we can do it properly in the first place, then perhaps there will not be a serious problem with the way girls approach computing."

Approved Brands

In its role as an advisory group for schools with computers, the Computer Education Unit supports only those brands which are on state contract. Says Jenner, "It's like the contract for lead pencils, except that it's a period contract whereby government schools

Association of Independent Schools

THE NEW South Wales Association of Independent Schools is taking on a role which might be described as counterpart to what the Computer Education Unit is doing for state schools in New South Wales.

The AIS is a non-profit organisation which provides education services and acts as an advisory body to New South Wales' independent schools. It is both advantaged and disadvantaged by its independent status: the advantage lies in being able to circumvent much of the sticky morass of red tape; the disadvantage, in having to organise much of its own funding.

Colin Woodley, a teacher and former computer consultant, who was among the first to start using computers in Australian schools, has joined the AIS with the intention of closing what he calls "the awesome gap between computers and the people who buy them for education."

At a recent press release, Woodley unveiled a plan to offer teachers, parents and students courses in how they can use computers for education, and advice on what kind of computer they should buy.

Thirteen teacher courses and one family course have been organised to begin in Term III (this month for most schools).

The family computer training course consists of three 90 minute sessions which will cover:

- A simple introduction to home computers, saying what they are; how children can become familiar with them and then expert in their use; and how a home computer can be used by the rest of the family.
- An analysis of the true educational value of a home computer.
- A demonstration of seven major computer brands and suitable software.

■ An evaluation of the computer's role in education today, and its relevance to children's career prospects.

■ The lighter side of computers – the games and an analysis of their educational value.

The AIS has one computer classroom equipped with 20 computers from Dick Smith Electronics, and another seven computers of different brands, at Wynyard House, 291 George Street, Sydney. Another similar centre is being established on the North Shore. Twenty lecturers from schools, universities and colleges of advanced education have been hired to conduct the classes.

The cost of the courses is \$85 for parents of AIS member schools and \$95 for parents whose children do not attend an AIS school. These fees include the opportunity to purchase computer products at special AIS-negotiated prices, and access to software library information services run by the AIS.

The AIS software library of information is the result of a survey circulated to all AIS schools using computers, asking them to list the programs they are using and have found valuable in the classroom. Data from this survey has been compiled to give details of each program, like cost, what machines it runs on, and a teacher rating.

Says Woodley, "It'll be an ongoing thing, and a Year 11 history teacher might ring up and ask what we've got on record for the BBC computer; or a parent could ring up and say, 'My child couldn't understand this today at school – what sort of program is there for a Year 9 student doing geology, on this particular subject?'"

The AIS is also organising a workshop for principals, the aim of which is to help them

determine how computers will be used in their schools. Says Woodley, "We'll be talking about the various objectives that can be achieved using computers in schools – and there are a whole range of them. I've found, in visits around our schools, one school's taking this tack, another's taking that tack and so on. And further, some are spending 50 cents a pupil on computers per annum and others are spending \$500 per pupil.

"It's a question the principals themselves need to be fully conversant with because it can be very costly and you've got to establish for your school exactly what it is you want to do with computers. Do you want to teach *with* them, or *about* them? Do you want to teach programming? We'll be putting these sorts of issues before the principals."

Yet another series of courses planned by the AIS will give direction for teachers using or thinking of using computers in subjects other than computer courses. Says Woodley, "It might be the use of computers in the history classroom and we'll have history teachers come along, or the use of computers in the economics classroom."

On the subject of buying home computers for educational purposes, Woodley also has strong ideas which he will be communicating to parents attending AIS courses. He says, "Although I've been involved with computers for a long, long time, this is the first year in which I've seen a compelling reason for parents to have a computer at home. I was always a bit undecided, but the costs have come down and the software has got just that much better now that it does make sense."

For more information on AIS courses, phone (02) 29 2175. □

buy their computers from contracted manufacturers for a period of two years, after which the contracts are reviewed."

Machines currently on contract in New South Wales are the Apple II, the Atari 800XL, the IBM-PC, the Microbee and the BBC.

Jenner continues, "You can't ring up here for any sort of technical advice or advice on software for machines which are not on contract.

"It also means that if schools are spending government or community funds, they are obliged to buy from the government contractors. The implication is that, in terms of general support, most schools tend to have contract equipment, so the network of expertise and the network of software will be greater for machines on contract."

The unit uses contract machines in its in-service courses, although, says Jenner "We try to make the stuff we teach as machine-independent as possible."

Looking toward the desired end result of his work for the unit, Jenner says he'd "like to see kids being able to use a computer whenever it's appropriate. If they've got a particular problem to solve, I'd like to see them first of all have the knowledge to know whether a computer is the right way to solve it, and then the knowledge to use the computer – with a word processor, spreadsheet, database or whatever."

When asked how he thought New South Wales is progressing in the area of computer education, compared with other states, Jenner said, "Some of the other states have had central organisation longer, and I guess they're ahead in that. Some of them have had computer science-type courses in the senior years for longer. But in terms of just using micros, with all kids, everybody's at the same stage. We're getting our act together pretty well.

"It's an exciting time," he adds. "Lots of things are happening, and it's almost all positive and ongoing. It's been a bit amorphous. Things have been happening since micro-computers came on the scene. But there are all sorts of approval mechanisms; things have to go back and forth and through all sorts of state and federal ministers. The Commonwealth programme is just sort of kicking off now." □

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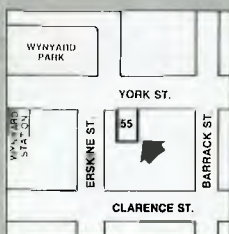
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Courseware Cross-Section

Microzine

Reviewed by Frank Lee



THIS IS a strangely packaged micro-equivalent of what some of our Very Old Readers may recall as the *Boys' Own Paper*. That was the original Penny Dreadful; a combination of yarns, mystery and adventure. It had how-to articles and puzzles. And it was very, very popular. Of course, that was long before television. Indeed it was contemporaneous with the early days of radio. My dad collected a heap of them over the years, passing them on to us Little Lees when he thought they might do us some good.

Here then, is BOP Revisited.

Firstly, a word about its presentation. An example of Scholastic's 'Wizware', it comes in a rather odd rhombus-shaped box containing a similarly shaped manual. Fortunately, the single floppy disk also contained within the box is square. The disk is double-sided, a practice which I abhor, particularly when used with single-head drives.

This particular issue is Microzine Volume 1 Number 2. The label indicates that its target is children aged ten or older, who have access to an Apple II Plus (or IIe) with 48K and a disk drive. Like

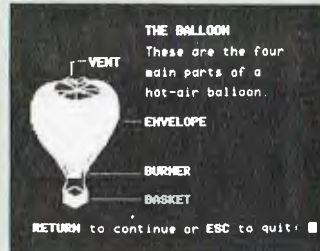
any normal magazine, it has an index. Since the software is very clear in its instructions, one gets the impression that its rhomboidal manual is superfluous. The graphics, like the colour plates of old BOP, are delightfully executed. I imagine that a ten-year-old would gain a great deal of fun from Microzine, but perhaps not much from an educational point of view.

Not in the Course

Not that I wish to be negative. Indeed, any environment which requires the exercise of problem-solving skills has a distinct educational value. The point which I am trying to make here is that the Microzine content is not related to normally accepted educational course material.

The disk contains seven sections.

- **What's Inside** – a summary of the next six sections.
- **Northwoods Adventure** – an interactive Adventure-style game combined with impressive graphics.
- **Melody Maker** – uses the computer to create, edit, record, and play back single-voice music (using the Apple's built-in speaker).



■ **Computer Stuff** – painless instructions for formatting a disk to be used for saving melodies and word ladders.

■ **Ride the Wind** – an interactive game in which you pilot a hot air balloon in a 'hares and hounds' simulation.

■ **Word Ladder** – a familiar game in which the player begins with one word, then transforms it one letter at a time to become another target word, such that all intermediate words are valid.

■ **What's Next** – a peep into the contents of the next issue.

Word Ladder would have some value in vocabulary building and spelling. I found the hot air balloon game just plain infuriating. I fancy myself as an armchair pilot, but managed to prang the rotten thing every time. This is clearly a job for Number One Son.

Melody Maker, although simple in concept and execution, could have a real value in introducing the principles of music notation to students.

In summary, a well presented recreational item with a modicum of educational value. The Ashton Scholastic price list indicates that only four issues of Microzine have been produced so far. Each issue costs \$49.95. For more information, contact Ashton Scholastic, PO Box 579, Gosford 2250; phone (043) 28 3555.



Computer Tutor: Basic Arithmetic & Algebra

Reviewed By
Dr Robin Porter
Lecturer in Teacher Education,
Macquarie University

A potentially excellent computer program is one which allows the user, rather than the computer, to be in control of the decision making. Computer Tutor: Basic Arithmetic & Algebra is not such a program.

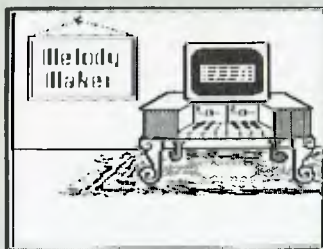
Basic Arithmetic & Algebra is the first in a proposed series of programs based on the New South Wales Higher School Certificate 2 Unit Mathematics course. It has five parts on two disks, and is recommended for use by students in Years 7 to 12.

Although initially the user can choose any of the five parts, little choice within each part is given; the program merely proceeds through a set of programmed instructions, again and again, until all criteria for correctness are met. Even when an opportunity for choice is given, and the user exercises that choice, the computer takes over and says something like, "That leaves only Section III, so we'll start with decimals, just to make sure", even though the user may have chosen to do decimals. It would be more 'user-friendly' if students could select from menus, rather than having to answer questions. Also, it would be easier to select a part from a menu, rather than having to turn the computer off and reload from the disk each time the user wants to do a different part (although this would have the disadvantage of a much longer initial loading time).

Counting the Sections

The five program sections are labelled as follows:

- Part One**
Integers
Rational Numbers
Fractions



Part Two

Multiplication & Division of Fractions
Decimals
Related Topics

Part Three

Operations with surds
Algebra I – Simplification
Algebra II – Factorisation

Part Four

Algebra III – Further Factorisation
Algebra IV – Algebraic Fractions
Algebra V – Equations

Part Five

Algebra VI – Linear Equations
Algebra VII – Quadratic Equations
Algebra VIII – Simultaneous Equations
Algebra IX – Linear Inequalities

According to a statement in the introduction, the program is "designed to take you through the HSC 2 Unit Mathematics syllabus step by step". It is intended for home use rather than school use,

and claims to "prepare for examination conditions, and include examples of questions from past papers of the NSW HSC 2 Unit Mathematics Examination." These objectives are not clearly stated and have to be searched for in the very brief support material provided with the program.

The Importance of Parents

Since the program is designed for home use, a set of instructions for parents is included. However, these appear to be something of an afterthought. Given what is known of the importance of the role parents play in a child's school achievement, these comments for parents should have a more prominent and integral place in the material which accompanies the program.

The majority of text displayed by the program is light-blue on a dark-blue background. One wonders why the Commodore 64's

colour combinations have not been utilised (as in Easyscript). This would allow the user to choose the colours which he or she finds most pleasant to work with. The flashing yellow border which acts as a sort of reward for correct answers can become a source of irritation after a while.

Motivation or Frustration

The authors of the program are described as "university-trained specialists in the fields of learning and motivation". However, one wonders whether the word 'motivation' has been misunderstood in this case. Unfortunately, the program would appear to have the potential for engendering frustration and anxiety in some users. For example, when a section has been repeated several times, and a wrong answer, even an inadvertent wrong letter, means going back to the beginning, fear of this happening could create tension and further errors.

It would be more helpful to the learning process and user's interest if feedback on why an answer is incorrect were given. It seems inappropriate to have to repeat sections when the error was one of typing or spelling, and not misunderstanding of the mathematics concept. A point in the program's favour is that it is self-paced, so there is no pressure to 'keep up' with anyone else. But, the advisability of working for two-hour sessions, as suggested in the documentation, is questioned. For some users, short sessions (20-30 minutes) daily might be more beneficial.

It is recognised that language plays a very important part in Mathematics, but, for a mathematics program, this one does seem to require an awful lot of reading. One could assume students in Years 11 and 12 would be able readers, so their development of mathematics understanding would not

Spell Out

Reviewed by
Dr Robin Porter



Lecturer in Teacher Education,
Macquarie University

SPELL OUT is what might be called an ideal program. It is clear and simple, easy to use and requires the user to determine the words which need practising. Furthermore, the activities it uses are of the kind that children of all ages like doing. There is just one snag – and it's a big one, particularly for home users. The exercises can only be done from hard copy. This means that Spell Out is only useful if a printer is available. There is no way any of the exercises can be done on the computer. Once the words to be practised have been typed in, and the computer has done the sorting and sifting to produce the exercises using these words, and the hard copy has been produced – it's back to pencil and paper.

Thus, the program would seem more appropriate for school use, as schools are more likely to have printers than are homes. In fact, it could prove very useful indeed for teachers.

According to the documentation, Spell Out is "designed for primary school children to help them study their weekly spelling lists". It certainly does this, using a variety of techniques. These include:

- typing the words incorrectly
- letter scramble
- fill in the missing letters
- wordsearch

Whichever Words Want Work

The words need not be confined to the "weekly list", but can be any list of words. For example, they could be all related to a particular topic or hobby that the user is interested in, or they could be words the student has particular difficulty with. In this way, the use of the program becomes more flexible and fits better the current approaches to teaching

spelling, which are moving away from the "graded weekly lists" to a more individualised approach of teaching words children want to use in their writing.

The solution to the wordsearch activity is given, so that the child can check for correctness. A check of the other activities would have to be made from the original word list.

The notes to parents are very brief indeed. While teachers who used the program will know how to encourage and guide children and help them with corrections, it would probably be helpful to parents to have some suggestions on how they might support and encourage children, help them to correct their work, and complete the exercises without reference to the word list. That is, the value of the program would be lost if it became merely a copying exercise, or if spelling errors remained uncorrected.

Although there are instructions for loading from disk on the program packet, the

documentation provided only gives instructions for loading from cassette. This could be changed to include instructions for disk, merely to reassure parents and teachers that they really do have the right notes for the program they purchased.

Spell Out should provide a very enjoyable means of practising spelling, both in the home and in the classroom. It requires plenty of user involvement; and the student determines what words are to be practised, thus also determining the level of complexity. Also, the user can proceed at his or her own pace. All these characteristics are consistent with sound learning practices. Investment in this program should net a good return – not only for primary school children, but for adolescents and adults, too.

Spell Out is published by Ozisoft, Suite 35, 8-24 Kippax Street, Surry Hills 2010 (phone (02) 211 1266). It costs \$19.95 on cassette and \$24.95 on disk. □

be hampered by lack of reading competence. Some younger children for whom this Computer Tutor program is recommended may encounter difficulty with reading.

It is a pity the program developers have not taken full advantage of the Commodore's capabilities. Basic Arithmetic & Algebra really does little more than a textbook. A computer program should be able to provide the user with specific feedback on strengths and weaknesses and on what areas the user needs to devote time to.

Despite the many criticisms of this program, it must be said that some students may find it suits their particular needs and learning styles. Learning and motivation to learn are very individual. Parents would be advised though, to arrange for their daughter/son to trial the program before purchasing it.

Genetic Inheritance

Reviewed By
Ken Baumgarner



*Senior Tutor,
School of Education,
Macquarie University*

THIS cassette incorporates two related programs for biology and science students of 15 to 18 years of age. Both programs were written using the Word-a-Bee authoring system, which allows students to backstep through the program to review previous work.

Side One, 'Hum In' (Human Inheritance), deals with six human genetic characteristics. Its loading time is about seven minutes, and it seems to be well presented and able to be used by the age group for which it is intended.

Tribes Are the Norm
The user can study monohybrid

cross and dihybrid cross patterns. The assumption is made that families have large numbers of children and that F1 offspring are genetically identical when producing the F2 generation.

Although a printer is not needed for the display of data, there is a facility in the program to dump the data onto a printer for analysis.

One limitation of the program is that only two generations can be analysed, thus making it useful only for introductory studies in genetics. Another feature which might have been included is a summary statement of the data generated, so a visual analysis could be done if a printer is not available.

Mendel's Theories

Side Two of the cassette, entitled Mendel, simulates and tests the validity of results

obtained by Gregor Mendel. It is designed along the same pattern as the Hum In program, except the user chooses dominant and recessive characteristics for the experiment. The final part of the program suggests the users compare their results with Mendel's data, so it would be essential for students to be familiar with Mendel's laws.

The limitation again is that students can only work with F1 and F2 generations. Mendel would be a useful aid for students working through a workbook on Mendelian genetics, as long as the two generation limitation was acknowledged. The loading time is about six minutes.

Genetic Inheritance is produced by Honeysoft, a division of Applied Technology (1a Pattison Avenue, Waitara 2077; phone (02) 487 2711), and costs \$14.95.

Now, a multi-user system that lets you add users without losing performance.

The Pulsar System 7000 is a Multi-User Z80A based system running at 4Mz. Each system may be expanded to 4 users, with each user having their own 64 or 128K of Ram and a unique Z80A at 4Mz.

The system has hard disk capability to 100Mb with floppy disk back up of 1.4Mb per floppy. Also available 5Mb removable hard disk.

Each system has a minimum of two bidirectional RS232C printer ports (expansion to 8 ports is available).

System 7000 uses the industrial standard STD Bus concept allowing the use of various cards including colour graphics.

The system 7000 has been designed by Pulsar Electronics in Australia to meet Australian conditions.

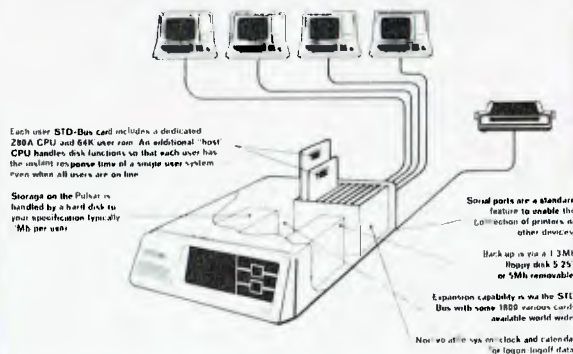
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PULSAR 7000 Multi-User Computer System



COURSEWARE

IBM PC



The McGraw-Hill Interactive Authoring System

Reviewed by
Brian Baldie Ph.D.
*School of Education,
Macquarie University*

THE MAIN aim of authoring systems is to create learning experiences that allow the learner to play a part in determining their instructional path. In this way the learner's cognitive style is approximated by the instructional program.

An authoring language incorporates components of a word processor, graphics generator, video controller, and the logic of an instructional designer. With these capabilities the user is able to generate interactive computer-assisted instruction which follows effective learning paths. Video segments may be included at appropriate points in the total presentation. The programming costs are reduced, since the person creating the lesson is given an array of options which focus on instructional goals and do not require programming skill on the part of the trainer/teacher.

The McGraw-Hill Interactive Authoring System (IAS) has all the capabilities of other such systems, but with the advantage of being relatively easy to use. The IAS package is particularly user-friendly in the sequencing of material, and in establishing branches on the basis of learner responses. The clear and concise handbook, through the treatment of flow-charting, prepares the trainer/teacher to design instructional maps which lead to the achievement of the stated objectives.

The general documentation is clearly referenced and easy to follow, providing an excellent example of how all handbooks should be presented, but so often are not.

Features

The IAS package offers the user a selection of features which include:

- sixteen foreground colours and eight background colours
 - blinking capability
 - colour flooding
 - help messages
 - graphics mode
 - box features
 - trail features
 - the ability to insert and erase characters
 - variable speed of presentation of screens
 - the ability to specify the area of screen to be used.
- The basic types of lesson display screens are: Presentation; Multiple Choice; Matching; Fill in the Blank; and Application/Simulation.

Worth Waiting For

Working with IAS Version 3.0 on the IBM-PC, it was a little worrying that 128K was required for delivery of lessons. With Version 3.1 (soon to be released) lessons can be delivered on any configuration of the IBM-PC. This includes the IBM-XT, the IBM-PC with one or two disk drives, the IBM-PC with only 64K of memory, and the IBM-PCjr with one diskette drive.

The other feature lacking in the original version of IAS was a record-keeping facility. This could be achieved by incorporating another McGraw-Hill program, which, of course, added to the initial cost of the program package. The problem has been eliminated in the 3.1 version, where learner responses can be stored for the trainer/teacher to access.

Two other important and particularly impressive features have been added to the new version. First, the 'screen capture utility' enables the designer to incorporate images from IBM application programs and from programs downloaded from a mainframe. Also, the 'lesson consolidation utility' permits the consolidation of up to 300 lesson display screens on one lesson disk.

Professional Help

The production of video segments (if not already available), and the creation of

instructional units through combination of the capabilities of IAS and instructional design principles may be beyond the resources of some organisations. For those companies that require support in some or all areas of production of computer-based training programs, Pathfinders Interactive Systems of Crows Nest ((02) 439 3380 or 439 3413) is a company which offers support either during the initial stages of computer-based training development, or on an ongoing basis by producing instructional or marketing videos. It can provide assistance in the writing of instructional/training programs or act as consultant at any stage of development.

The Interactive Authoring System costs \$2400 (this

includes the manual, authoring diskette and one delivery diskette), and extra diskettes cost \$240 each. The package will also soon be available for Apple II or IIe computers with at least 128K, two disk drives, 80 columns and a Pro-DOS environment for authoring. A 48K memory, one disk drive, 40-column upper-case or 80-column upper and lower case are required for delivering lessons. The Apple version 1.0 has the same features as the IBM version 3.1. For further information, contact the software division of McGraw-Hill Book Co, 4 Barcoo Street, East Roseville 2069.

In my opinion, the McGraw-Hill IAS is the ideal program for teachers who wish to introduce the use of economical but instructionally effective training programs. □

Annam

Reviewed by
Evan McHugh



ANNAM is a simulation game based on a political situation similar to that which Vietnam found itself in before it fell to the Communists. It is recommended for use in Social Studies courses and claims to improve skills in understanding cause and effect, trade-offs involved in political decision making, US aid from the perspective of a recipient country, and the

problems of a Third World Country. It also claims to stimulate interest in world affairs and encourage careful reading and analysis of information.

Apart from its claims as an educational tool Annam is a lot of fun to play. The program puts you in the shoes of the emperor of Annam, a country with an unstable government and

threatened with overthrow by the armies of the Communist forces. Your success as emperor is measured in terms of your popularity rating amongst the peasants and the number of soldiers in your army compared to those in the Communist army. To win the game you have to stay in power for four years, keeping your popularity over 10 per cent and your army over 50 per cent of the size of the Communists'.

A Risky Business

You start off with a popularity rating of 60 per cent and the armed forces are even. Apart from nurturing your popularity and guarding against communist overthrow, you have to contend with Buddhist unrest, traitorous generals and wily old women with knives. For example, in one case, the Buddhists become restless and newspaper articles appear accusing you of being unsympathetic. You are offered the choice of ignoring the Buddhists, arresting them or appointing one of them as your Minister for Finance. If you ignore them the Buddhists set fire to themselves and your popularity falls by as much as 10 per cent. If you arrest them the same thing can happen. If you make one your Minister for Finance your popularity goes up, but the guy you appoint is a long-time rival and will try to do you in every chance he gets. He may end up doing nothing but he may accuse you of stealing five million dollars and overthrow you.

The choices go on like this throughout the game. Usually if you make good choices you will do well, but sometimes, even when you are playing well, a disaster will befall you and you will be killed or exiled by events totally beyond your control. Some of the options given are also restrictive at times. For example, you have no choice about the Americans. At one stage you are asked how many Americans you want to come and help you fight the

Communists. This is a move that will always cost you in the popularity stakes, but you cannot say "Yankee go home". The least you can do is ask for 5,000 of their troops.

Another random choice is the old woman. An old woman approaches you and is threatened by a bodyguard. Your choices are to stop the bodyguard or let him blow her away. If you stop the bodyguard you are either a hero because the woman was asking for help for her starving family, or you collapse in a pool of blood because the treacherous old hag whips out a knife and slashes you to shreds. If you let the bodyguard blow her away you could be accused of brutality, whereupon your popularity falls by 10 per cent; or if she is found with a knife, then everyone is relieved that you are safe and your popularity is increased. This particular scene does not teach much about making choices, as there is a 50-50 chance that the woman is armed. All you can do is guess, and hope you make the right decision.

Life Wasn't Meant to be Easy

It is rare for a player to complete the game successfully; there are so many ways that you can go under, often because of what amounts to bad luck.

In fact, my main criticism of the program is that in the end it's usually luck which determines whether you get a high score or a low one. The particular clincher in this luck game is how many troops you lose in a series of three battles you're more or less obliged to fight - get routed here (which is out of your control), and there's no way you can get a high score.

As well as this, I felt Annam could have gone so much further than it does; there were so many openings for all sorts of other events, misadventures and choices that it could have provided a real in-depth analysis of the

continual trade-offs politics involves. It was frustrating that the game was always curtailed while it was still interesting and you were all set to try out more choices; the result was a certain feeling of superficiality. So now I'm waiting for someone to write 'Advanced Annam'; I'll be one of the first to use it.

Annam is very easy to get going on. One game and you'll have the feel. The program is self-explanatory and helpful in telling the user exactly how to do everything. The documentation is excellent, not only describing the way the game plays, but also making a number of suggestions as to ways in which it can be incorporated into courses.

The best way of playing Annam is to run through a number of games and try different approaches. For example, you can try being heavy-handed, build up a big army and hang the popularity. You can shoot anyone who even looks like a threat. Each game takes from five to fifteen minutes, so it's easy to complete several games in quite a short period of time.

Annam is published by Educational Activities. It is available in Australia from Micro Nationwide for \$59. Micro Nationwide is at 13/9 Bungan Street, Mona Vale 2103, PO Box 653 and phone (02) 99 1772. The company's Queensland address is PO Box 48, Darra 4076; or phone (07) 376 6971



One World Countries Database

By Evan McHugh

MANY common computing tools, like graphics packages and databases, are now being used in computer-aided instruction. The One World Countries Database is an information tool which applies all the features of a relational database to storing and sorting the socio-economic details of any number of countries.

The most significant capability of a relational database is that which allows you to search through information files looking for data with things in common. For example, you could search through a database of school children to find which ten-year-olds have red hair. To do this you would keep details of each child, including age and hair colour, and your search would be based on the information in these fields.

One World - Many Fields

The One World Countries Database has a data record

for every country in the world. When the database was set up there were 178 countries. Each data record is divided into a number of fields, which include the country's region, population, neighbouring countries, exports, religions, leader's name, type of government and so on, for a total of 33 fields.

Each country is allocated a number, to make calling up records easier. Students can also initiate a search and go through a menu-driven criterion selection routine to find countries with, say, a liberal government in the European region. Such a search will generate the numbers of the countries which meet the criteria and the student can specify which of these countries he or she would like to see the complete details for.

The package more or less drives itself. It is not difficult to work out how things are done, so minimal training is needed to begin work.

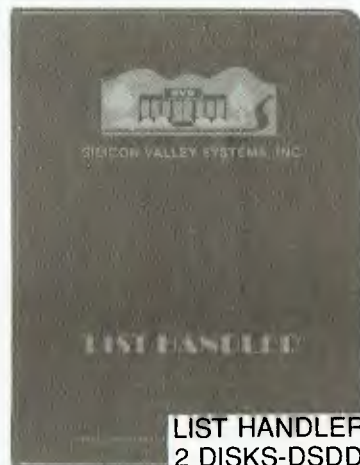
Stop press!!
Apple IIc version
due mid-September

HOW TO HANDLE YOUR APPLES...



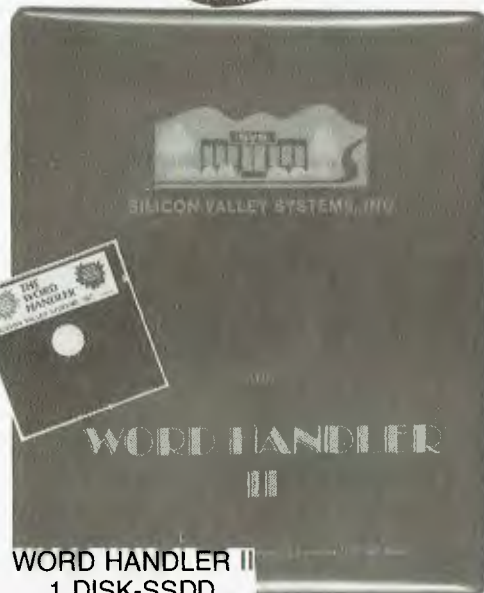
SPELL HANDLER
1 DISK-SSDD
\$85.95*

Spell Handler
Spell Handler is a 90,000 word dictionary that will check for and mark spelling and typographical errors in any Word Handler document. It also allows you to create custom dictionaries to include your own words. This program scans for errors at 600 words per minute. The Display Index allows you to access all files on your disk. Spell Checker allows you to use Spell Handler dictionary and/or customised dictionaries to check spelling in any document. When you set up Custom Dictionary you insert technical terms, Proper names, foreign words up to 2000 words per document.



LIST HANDLER
2 DISKS-DSDD
\$79.95*

List Handler
The easiest to use, fastest and most flexible program available for managing large lists of information on Apple computers. List Handler allows the creation of lists made up from many thousands of records managed and stored on disks. You select and name your record fields with up to 200 characters, and each record can hold up to 4000 characters. A single disk will store up to 3000 records — That's 12 million characters on file! List Handler's advanced techniques enables high speed searches and sorting. For users 'on line' with multiple disk drives List Handler will allow simultaneous access to 8 drives with a maximum of approximately 24000 records total.



WORD HANDLER II
1 DISK-SSDD
\$85.95*

Word Handler
Engineered to be a word processor of maximum convenience on a minimum Apple II. Controls arranged for simplicity, with clear display format. You will find the Word Handler to be surprisingly powerful and yet easy to use. It comes complete with the Word Handler Manual and Tutorial book so you'll be operating the program like a pro in 20 minutes. The Tutorial carries you through to more advanced knowledge of its capabilities, and enables the user to explore the fascinating combinations of text-editing situations to discover how simple the world of comprehensive word processing really is with Word Handler.



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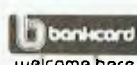
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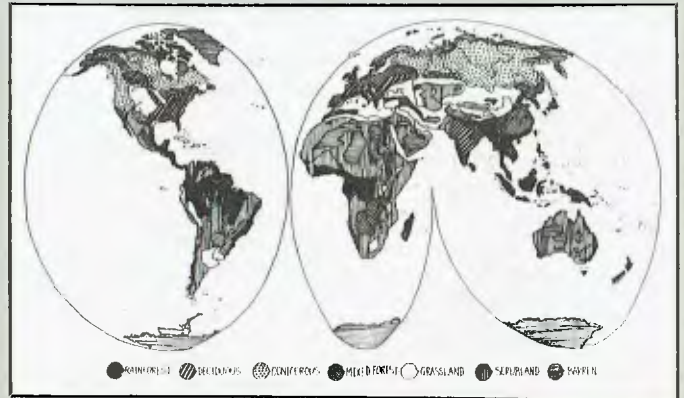
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COURSEWARE

Documentation for the One World Countries Database is quite comprehensive. A large quarto-sized binder covers every aspect of the package, describing its layout, the data that can be retrieved and the ways in which it can be

retrieved. A large amount of material is also provided for teachers, telling them how to use the package to its fullest in getting students to look for information contained within the package.



When the Facts Change

The only disadvantages of this program are those that go with any database, or for that matter, with any textbook on the socio-economic situation. The major problem is that databases need to be updated. If they fall behind, they become useless. At the moment, the maker of the package, Active Learning Systems, has plans to provide a facility for updating, but there really should be a register of users who would receive notification of the latest version and have access to low-priced up-grades.

The other problem is the limitation of the structure and scope of the database. Some teachers may find it doesn't

cover enough areas, or that the amount of information in some areas, say, the goods exported, is not sufficient for what they wish to teach.

What it comes down to is personal preference. Some may see this database as no more than a glorified book, while others will see a tremendous potential for stimulating children to learn about the way the world can be broken up into numerous relationships and groupings. Imagination and teaching style will probably be the final deciders with this package, which is well conceived and well executed.

The One World Countries Database costs \$85.00 and is published by Active Learning Systems, PO Box 197, Indooroopilly 4068, phone (07) 221 9823. □

The CARE Project By Chris Welsh

THE Computer Assisted Remedial Education (CARE) project is a project jointly funded in 1984 by the Curriculum Development Centre and the NSW Department of Education. The aim of the project is to produce a range of computer programs in the area of language and mathematics for use in an individual situation by a resource or class teacher.

While the prime intention of the programs is to serve the interests of pupils in the remedial situation, it is accepted that they may also

be used in a more general way with other students. The group works to the formula that remedial programs should comprise high-interest materials at an appropriate level to the pupils' capabilities.

The project is sponsored by five local primary schools between West Ryde and Hunter's Hill, and is based at Denistone East Primary school, where two programmers and a part-time resource teacher develop the programs and documentation which the participating schools test in the classroom situation.

Contact has also been established with secondary schools in the area for their resource teachers to utilise appropriate programs in the trial stages, and a facility will be available whereby parents from the trialling schools may use the programs in a home situation.

The Computer

All programs are being developed to run on the 16K Microbee, since this is the most common computer in primary schools. Transferring the programs to other computers has been avoided

so far, mainly because it was deemed necessary to take advantage of the particular features of whatever computer the programs were to be programmed on. Many of the CARE programs take full advantage of the graphic capabilities of the Microbee, while others are self-modifying; that is, these programs alter themselves as they run. This technique allows a teacher to enter a spelling list, for example, into a program; the spelling list is POKEd into the program's DATA statements; the teacher can then save the new program on disk or



COURSEWARE

cassette; and the next time the program is loaded from that filename or cassette, it will use the new spelling list.

The Programs

After extensive trialling, the first two programs are ready for release. These are:

CARE Spelling – a program which allows the teacher to individualise the spelling list to suit different children. When a child enters his/her name, the program works out which spelling words are for that child and drills them on that list.

What's the Time, Mr Wolf? – a drill and practice program which displays a clock face showing a time. A wolf points in turn to each of three possible times (answers). When the wolf points to the time displayed on the clock face the child presses the RETURN key. Another wolf then 'carries' a letter onto the screen. The child continues, with the wolf bringing a new letter onto the screen for each correct answer until a 'mealtime' word or phrase is spelt out (for example, hamburger). The wolf then reappears and 'gobbles' all the text and graphics from the screen.

The project team is now trialling a series of 'choose your own adventure' style reading programs in the co-operating schools. These programs form the basis of a reading package which will be available in August. In addition a 'reading for meaning' package is being prepared and will soon be trialled. Also under preparation is a maths package for use in infants' schools, which will assist in the reinforcement of number concepts.

Caresoft

To facilitate the distribution of the programs, a cottage industry operation, to be known as Caresoft, has been established at Denistone East Public School. Here the programs are produced and packaged, and are made available to schools and to the public for \$12.50 each on cassette or \$15.50 on disk. □

Senior School Science

Reviewed by
Mike Newnham

SENIOR School Science is a program set of six cassettes, containing ten programs. The tapes are packaged in a wallet-style vinyl case with a moulded nest for each cassette.

While I am not a teacher and could not test these programs in the field, I have assessed each program on the basis of how it treats its subject, and on the extent to which an attempt is made to provide the student with some feedback on his progress. Some material does not lend itself readily to being incorporated into a computer-aided instruction program; for instance, large amounts of text are more easily read from a book than from a VDU. However, computer simulations of events or systems which students would ordinarily be unable to see will extend their understanding of a process by allowing them to 'observe' it.

Some of the following programs provide primitive but demonstrative simulations, together with an evaluation of the system they are designed to represent. Of the remainder, some are simply quiz-style programs aimed at testing and reinforcing a student's knowledge of his subject.

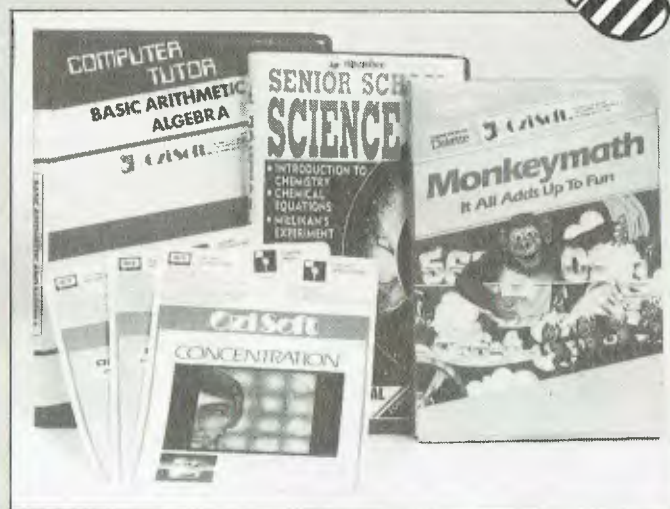
The six tape titles are:

- Introduction to Chemistry
- Chemical Equations
- Coulomb's Law
- Kepler's Laws
- Millikan's Experiment
- Vector Tutorial

Introduction to Chemistry

On Side One this tape has a program entitled 'Compounds and Formulae', on Side Two is 'Elements and Symbols' which should in fact be mastered before 'progressing' to Side One.

Using 'Elements and Symbols', pupils may select whether the computer will prompt them with either the name of an element or its



chemical symbol. Students must respond to the prompts with their counterparts (either element or symbol). This program works quite effectively, with letters created from low-resolution, enlarged graphic characters which are very easily read from the back of a classroom.

Correct spelling of element names is necessary, and entry of the elemental symbols must be in conventional form. For instance, a two-letter symbol such as Br (bromine) must be entered with the first letter in upper case and the second in lower case.

Tests are presented in groups of ten questions, with a choice of Years 8, 9 and 10 as separate levels, and Years 11 and 12 selected as one level. The tests simply include more of the periodic table the higher you go in Years. The program uses the elements up to and including thorium.

'Compounds and Formulae' operates in much the same way as 'Elements', except the student must supply a complete chemical formula in response to being prompted with the name of a compound.

There are 110 basic inorganic compounds used in this program, together with their chemical formulae. An interesting feature is that the correct subscript format is

used when formulae are printed to the screen. The author has simply created his subscript characters using high-resolution PCG characters. This detail, while obviously necessary, is still a nice touch.

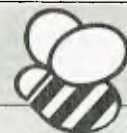
Tests on Compounds and Formulae are presented in groups of five questions, and the student is given a score on completing each group. Students using this program will need to have an understanding of compound fundamentals and chemical valence.

Coulomb's Law

In 1785, Charles Coulomb used a device called a 'torsion balance' to observe and measure the forces of electrical attraction and repulsion between charged spheres. From such experiments he deduced the physical law to which these forces adhere.

This program simulates an apparatus (not the torsion balance) which allows students to demonstrate the behaviour of these forces, and to observe some of the basic relationships for themselves. The equipment used for the experiment is created as high-resolution graphic line drawings on the screen.

The student may charge one of two spheres and carry out some tests to examine



the nature of the forces existing between the spheres when they are brought near each other. The program does not prove Coulomb's law, but demonstrates the process by which it was derived by Coulomb.

In the main, this program is above average, but it is somewhat vague in the instructions to the student regarding the use of the simulated apparatus. Providing a teacher is present to monitor the use of the program, this may not be a problem.

Kepler's Laws

Kepler's Laws is a program which uses basic animation techniques to model planetary orbits, and is based on Johannes Kepler's three laws of planetary motion.

The aim of the program is to demonstrate to the student the application of these laws.

The program first tests the Law of Periods, which applies to the period of a planetary orbit. An imaginary solar system with three orbiting planets is simulated on the screen. It is necessary to boost the brightness of your monitor here, to make the planets (single pixels) stand out from the stars (also single pixels), although the planets are moving.

Students examine the relationship between the radius and the period of a planet's orbit using this law, and are asked to make certain calculations and enter the results into the program. An error on their part will not cause students to be ejected from the program with a zero score, but will instead generate a request for the them to re-enter their results. On completion of this stage, the program instructs the user on how to best evaluate the

results he or she has obtained from the calculations.

The second part of this program is designed to demonstrate both the Law of Areas and the Law of Ellipses, by jumping to another fictitious planetary system where a lone planet orbits a star. The orbit of this planet is halted at regular intervals to allow students to retrieve data for use in their own evaluation of these two laws.

This program is introduced by a line drawing of a well-known time machine and its equally well-known occupant, both of whom might have been better off somewhere else in time. The graphics used to create the two imaginary systems could stand improvement in the form of highlighting the orbiting planets, or making them larger than the stars.

Aside from the use of

simple animation, I don't believe this program provides an any more revealing study of Kepler's Laws than a good physics text book would.

Millikan's Experiment

Side Two of this tape provides an introduction to the Millikan oil drop experiment and details the underlying principles. There is a discussion of the behaviour of charged particles within an electric field, and of the way Millikan was able to use these principles in his test apparatus to deduce the electrical charge on one electron.

Students are tested a number of times during this introduction, to gauge their understanding. The tests are in the form of fundamental questions which, if answered incorrectly, cause the machine to respond with both the correct answer and a

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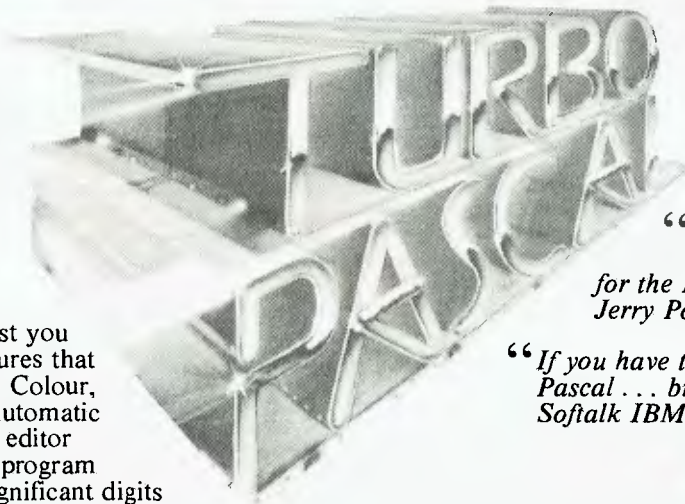
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suggestion that the teacher's help be sought.

Side Two of the tape is the actual simulation of Millikan's experiment, and the program opens with an explanation of the equation used to derive the charge on a body in an electric field. Following this is a detailed examination of the Millikan experiment, commencing with the apparatus and an explanation of the function of each item.

By means of a real-time graphic display the student may simulate the experiment himself, retaining complete control over all the variables.

This is the most demonstrative and informative tape of the set. There has certainly been a great deal of effort put into the two Millikan programs to provide an excellent discussion and simulation of the experiment. In the absence of the proper apparatus for this experiment, the use of computer simulation is far superior to using a text book alone.

If you have access to a Microbee, and if Millikan's Oil Drop Experiment is on your syllabus, then this program is well worth investigating.

Vector Tutorial

Vector Tutorial (Side Two) opens with a discussion of the nature of vector and scalar quantities. The program proceeds through the geometric method of addition of vectors in a clear and concise manner.

Students using this program are tested at the end of each stage by means of sets of five questions. Failure to answer all five questions correctly prevents the student from progressing further, until he correctly answers five more questions.

This tutorial is very well put together and I believe, from my own experience of the program, that it makes a dry subject just a bit more palatable.

Side One of the tape is titled 'I-J Vectors' and is an examination of the resolution and addition of vectors, using the analytic method. This technique is applied where vector components may exist in more than two dimensions.

Again, a well written tutorial which tries to ensure, at every stage, that the student is following the subject. This program also provides a five-question test to enable students to see just how they are coping.

The Vector Tutorial tape provides solid, valuable information on its subject. If vectors are on your syllabus, or if you just want to see a fine presentation, I recommend this tape.

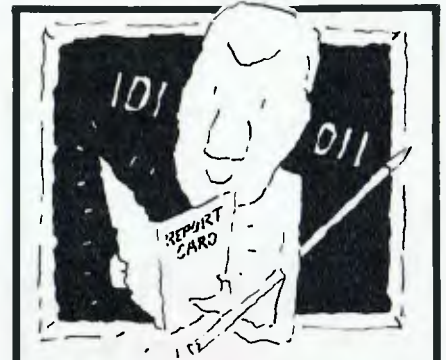
Now, The Bad Points

Well, there you have it: a science software six-pack from Honeysoft. It is time, now, for some criticism. I can't help wondering if even the creators of the Microbee have little faith in the 1200 baud tape routines of the Bee, since all ten programs in this package were dumped at 300 baud. There's nary a 1200 baud copy to be found. The total loading time for all these program runs to about 50 minutes plus. This is not a serious drawback because the programs are not copy protected and it's possible to create a 1200 baud back-up copy of each.

One thing I have mentioned in the past and will continue to gripe about is the presence of spelling errors in programs. There is absolutely no excuse for them. Three of the programs in this package contain spelling errors, though no important terms are spelt incorrectly. While the original fault lies with the author of the software, the distributors of the material compound the error by selling the program with errors intact. Spelling errors in educational software are particularly intolerable.

Gripes aside, this package is reasonable value for money, but see if you can get a 1200 baud copy as well. The two finest programs in this package are Millikan and Vector Tutorial, which represent truly professional efforts.

Senior School Science costs \$49.95 on cassette and is produced by Honeysoft, a division of Applied Technology at 1a Pattison Avenue, Waitara 2077; phone (02) 487 2711. □



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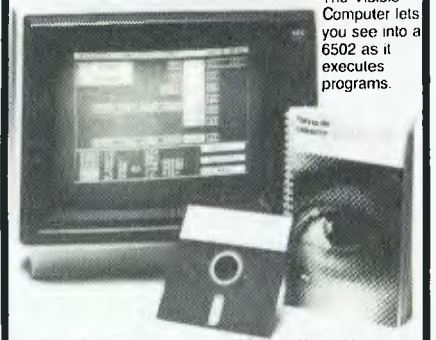
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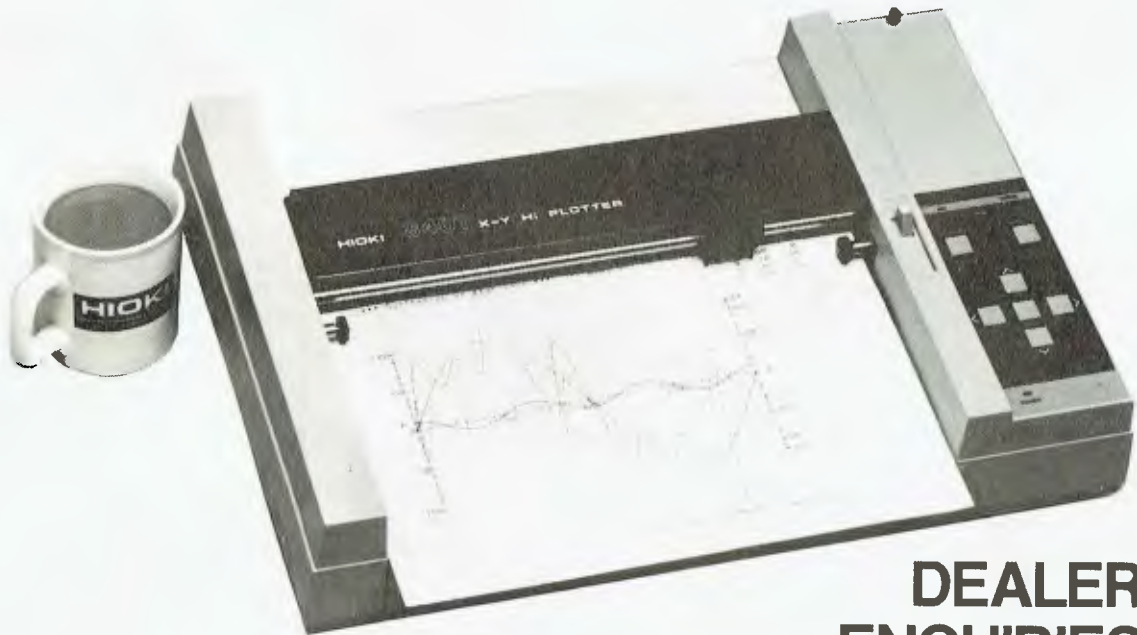
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POCKET PROGRAMS

SHARP/TANDY PC

```

10 B=25R,R=B-INT(B/E)*E:RETURN
20 GOSUB 10:L$="":X=INT(13R/^8)+1
30 IF X=1 THEN 100
40 IF X<11 RETURN
50 GOTO (5X+(X-10)*5)
60 L$="JACK":GOTO 90
70 L$="QUEEN":GOTO 90
80 L$="KING"
90 X=10:RETURN
100 L$="ACE". IF G$="MY" THEN 130
110 INPUT"ACE AS 1 OR 11?":X: IF (X<>1)*(X<>11) THEN 110
120 RETURN
130 IF T<=10 LET X=11
140 RETURN
150 "A" GOSUB 460:PAUSE " << PONTOON V4.02 >>"
160 U=100,V=U
170 G$="YOUR",O=0,M=0,S=0,T=0
180 GOSUB 20
190 PAUSE G$: " CARD IS A ";L$:"--":X:T=T+X:PAUSE G$: " TOTAL = ";T: IF T=21 THEN 310
200 IF T>21 THEN 370
210 IF G$="YOUR" THEN 270
220 IF T<=11 THEN 250
230 P=1-(T-10)/11:GOSUB 10: IF P>R/^8 THEN 250
240 GOTO 400
250 GOSUB 10:D=(INT(.4*(O/(U+O))*R/V/^6))^2,V=V-D,M=M+D: IF V<5 THEN 360
260 PAUSE "I BET $":D:GOTO 180
270 INPUT "BUY OR S?IT?":Q$
280 IF Q$="B" PAUSE "YOU HAVE $":U: INPUT "BET $":C:C=INT(100C/^2),U=U-C,O=O+C:
IF U<5 THEN 360
290 IF Q$="S" THEN 180
300 PAUSE "---- NOW ITS MY TURN ----":G$="MY",S=T,T=0:GOTO 180
310 BEEP 2: PAUSE "PONTOON - ";G$: " BONUS." IF G$="MY" LET V=V+50:GOTO 400
320 U=U+50:GOTO 300
330 PRINT "YOU $":U:" ME $":V
340 INPUT"ANOTHER HAND (Y/N)?":Q$: IF Q$="Y" LET T=0,G$="YOUR",M=0,O=0:GOTO 180
350 BEEP 2:PRINT " ** GUTLESS WORM **" :END
360 BEEP 3:PRINT "BELOW LIMIT - ";G$: " LOSS." :END
370 PAUSE "### ";G$: " HAND IS BUST ###"
380 IF G$="MY" THEN 450
390 GOTO 440
400 PAUSE "-----* I SIT *-----"
410 PAUSE "### COMPARING CARDS ###"
420 PAUSE "**** YOU ";S:" ME ";T:" ****" IF S>T THEN 450
430 IF S=T PAUSE "-----** DRAW **-----":GOTO 450
440 PAUSE "***** I WIN *****" V=V+M+O:GOTO 390
450 PAUSE "-----** YOU WIN **-----" U=U+M+O:GOTO 390
460 E="8+1,R=ABS(439147+R+Z)":RETURN

```

PONTOON

By Darrell Berry,
West Tamar Tas.

This pontoon program uses a sort of recursive technique to reduce its size by about one third, so that the program can include a couple of novel features and still be only about 1.2K long.

When the computer has its turn its choice to buy or sit is made on the probability that taking another card will take its total over 21. Its bets are also based on the percentage of your reserves that you bet, so the bigger your bet, the bigger the computer's will be. To increase its bet, change the 0.4 in line 250 to 0.7.

The strange structure is made necessary by the recursive technique used, and the need in the PC to optimise for speed.

To win the game, you must get your opponent down to less than \$5.00. You start with \$100, with \$50 bonuses for pontoon. In the case of a draw, you win.

The program is executed in DEF mode by SHFT A.

In the listing, the exponent "E" symbol is represented by an up-arrow.



BOOLEAN LOGIC IN ONE-LINE BASIC

By John Fisher, Wollongong NSW

I remembered the old game of trying to write "one-line" programs. The classic HI-LO game seemed a good target to start on. However, I soon found myself tangled up in the logic of choices. Then, I remembered that the Apple II indicates logical True by 1 and logical False by 0.

That is, the expression $3 > 4$ evaluates to 0, while $3 + 4 = 7$ evaluates to 1.

So if X is less than, equal to, or greater than G, a value of A can be calculated in the form:
 $A = 1 * (X < G) + 2 * (X > G) + 3 * (X = G)$

The expressions in brackets evaluate to two zeros, for the false statements, and a 1 for the true. Either 1 or 2 or 3 is multiplied by one, and the other numbers are multiplied by zero. Thus, only the number corresponding to the true statement survives, to be used in this program as an index to determine which message is printed, and as the index of a ON..GOTO statement.

Not all BASICs use 1 for truth. The ZX80, I believe, uses

- 1, Test your BASIC by typing in immediate mode:
 PRINT (3<2), (2 + 3 = 5)

These should lead to answers like:
 0, 1

Try the experiment, and find out how your Basic handles Boolean Logic. It's a great way to stack three IF..THENs into one ON..GOTO.

Applesoft sets all variables to 0 on RUNNING a program. Thus, in this program X is defined as X, that is 0, added to a random integer from 1 to 100 multiplied by 1 if F is 0.

On looping back, X has a value. This value is added to the random integer multiplied by zero, and so the value of X remains unchanged until the end of the game.

While this is only a simple game, it is presented as an example of compact programming, in the hope that it will help some readers to understand some BASIC programs which use similar techniques without explaining them.

A listing is enclosed showing the program in one line, its listing formatted by THE LISTER from the Applesoft Carpenter suite, and a run of the program.

```
10 LET X = X + INT (100 * RND (1)
+ 1) * (F = 0)
LET F = F + 1
PRINT 1
LET A#(1) = "LOW":
LET A#(2) = "HIGH":
LET A#(3) = "RIGHT":
INPUT "GUESS (1-10):"
PRINT " GUESS #F IS "
LET A = (0 * (X) + 2 * (0) * X) + 3
+ (G = X)
PRINT A#(A)
ON A GOTO 10,10
```

-LIST

```
10 X = X + INT (100 * RND (1) + 1) * (F = 0): F = F + 1: PRINT A#(A) = "
LOW":A#(2) = "HIGH":A#(3) = "RIGHT": INPUT "GUESS (1-10):" GUES
S #F IS "A = (0 * (X) + 2 * (0) * X) + 3 + (G = X): PRINT A#(A): ON
A GOTO 10,10
```

END-OF-LISTING
 -RUN

```
GUESS : 50
GUESS #1 IS LOW
GUESS : 75
GUESS #2 IS LOW
GUESS : 87
GUESS #3 IS LOW
GUESS : 94
GUESS #4 IS LOW
GUESS : 98
GUESS #5 IS HIGH
GUESS : 96
GUESS #6 IS RIGHT
```

-RUN

```
GUESS : 55
GUESS #1 IS LOW
GUESS : 77
GUESS #2 IS LOW
GUESS : 88
GUESS #3 IS HIGH
GUESS : 82
GUESS #4 IS HIGH
GUESS : 80
GUESS #5 IS HIGH
GUESS : 79
GUESS #6 IS RIGHT
```

-RUN

```
GUESS : 55
GUESS #1 IS HIGH
GUESS : 25
GUESS #2 IS LOW
GUESS : 37
GUESS #3 IS LOW
GUESS : 45
GUESS #4 IS LOW
GUESS : 50
GUESS #5 IS LOW
GUESS : 52
GUESS #6 IS RIGHT
```

FILER

By Darrell Berry, Exeter Tas.

FILER allows the creation of a record-structured data base which may be searched on a record-by-record basis to print out records whose fields match a user-entered search specification.

In the accompanying example, a file is set up containing information on University students. Each record consists of three fields, containing data on student name, course and year of course. The record structure is defined, records for seven students are entered and then searched to find those who match the specification "NAME = JOHN OR YEAR > 2".

Each field may consist of either numeric or alpha-numeric data. On numeric data, search can be for data which is <, >, or equal to it. On alphabetic data, only equality may be tested.

A search specification consists of a series of conditions relating to single fields separated by the boolean operators AND and OR. For example, the specification
 COURSE = SCIENCE OR
 NAME = FRED AND YEAR <
 3 OR NAME = SUE

is valid. Note that AND and OR have equal binding strengths, so the above will be interpreted as ('all students who do science or are called Fred') and are in less than their third year) or are called Sue).

A specification may be as long as you wish, but long ones slow down processing quite considerably.

The four programs should be stored sequentially on a cassette, as each CHAINS the following one automatically.

Notes on the example:

A. If you are creating a new record type the cassette recorder should be set to RECORD. If not, the definition of the record type will be stored in the first data block on the data tape, so rewind it all the way and press PLAY.

B. The prompt "#spec" means you are to type an alphanumeric entry. The prompt "#spec" means the program expects a number to be entered. To terminate entry of a search spec, press <ENTER> without any input.

C. Options in <> are defaults, which will take effect if <ENTER> is pressed as a response. When a prompt appears which doesn't require a response (eg "enter<data> tape") press <ENTER> to continue. These prompts are to allow you to set up the cassette recorder and change tapes as required.

D. If you are using a stored record definition, the program will print out the format of the record after it is read in, as mentioned in "A".

E. Pressing <ENTER> when the first "\$sec" prompt appears will print out all stored records.

SAMPLE OUTPUT

```
=====
REC # 5
1> JOHN
2> MED
3> 1.
=====
REC # 6
1> KIM
2> ENG
3> 3.
=====
> COMPLETE
> SEARCH 7
> MATCH 2
=====
```

SAMPLE RECORD CREATION AND RECOVERY.

Note : User input is uppercase, computer prompting lower case.

COMMAND	COMMENTS
LOAD "FILER"	
<SHIFT> a	
> Filer v1.06	
enter <data> tape	see note a.
<ENTER>	
retype > STUDENT	identifies contents of record
new file <no> YES	as creating a new record type
no. of fields 2	store student name, course and year of course. this data now written to tape.
field # 1	
field is NAME	student's first name
field type (a/n) a	alpha data type
field # 2	
field is COURSE	student's course

field type (a/n) 1
 field # 3
 field is YEAR
 field type (a/n) N
 verify <yes> NO

enter <filer> tape
 <ENTER>
 create/<retrieve>
 enter <data> tape <ENTER>
 no. of records > 7
 rec # 1, enter fname
 data> DARRELL
 rec # 1, enter course
 data> SCIENCE
 rec # 1, enter year
 data> 2
 :

year of course
 numeric data type
 if ENTER then the record format is printed out, and changes to fields may be made.
 put in program tape
 next section of program is read in
 add data to file, or search through store
 put in data tape, press RECORD
 the number of records to be added to store
 from here to * will repeat seven times
 first student's name
 first student's course
 year of course
 entry of six more students

create/<retrieve>
 <ENTER>
 enter <filer> tape <ENTER>
 \$spec NAME
 \$spec JOHN
 \$spec OR
 \$spec YEAR
 \$spec 2
 #spec 2
 \$spec <ENTER>
 enter <data> tape <ENTER>
 no. of records 1
 another search <no><ENTER>

put in program tape, press PLAY
 entry of search spec. see note B

spec so far is output to printer

terminates spec. entry. Remainder of spec printed
 tape rewound to start of records
 number of records to search through
 searches until a match is found with the search
 spec, prints out matching record and continues

computer returns to immediate mode.

FILE1

```

1:PRINT "=====  

  =***=-=-=-=  

  :RETURN  

2:GOSUB 1:  

  PRINT ">> REC  

  <";J$;">":  

  RETURN  

4:L=K+1,C=INT  

  ((K-B)/2)+1:  

  PRINT USING  

  "###";C;" ";  

  A$(K);" <";  

  A$(L);"":  

  RETURN  

10:L=K+1:INPUT  

  "FIELD IS ";  

  A$(L)  

11:INPUT "FIELD  

  TYPE (A/N)  

  ">";T$:IF T$=  

  "A"THEN 15  

12:IF T$="N"  

  THEN 15  

13:BEEP 1:GOTO  

  11
  
```

```

15:A$(K)=T$:  

  RETURN  

100:"A"PRINT ">  

  :CLEAR  

101:M=116  

102:INPUT "ENTER  

  <DATA> TAPE  

  ",P$  

103:INPUT "RECTY  

  PE >";J$  

104:INPUT "NEW F  

  ILE <NO>";P$  

  :GOTO 110  

106:INPUT "#NFIE  

  LDS:IF B$=J  

  $LET N=A,B=M  

  -2N+1:GOTO 1  

  08  

107:GOTO 106  

108:INPUT "#HEAD  

  ER";A$(B):  

  GOSUB 2:FOR  

  K=BTO M-2  

  STEP 2:GOSUB
  
```

```

4:NEXT K:  

  GOSUB 1:GOTO  

  190  

110:INPUT "NO. O  

  F FIELDS > "  

  N:B=M-2N+1,  

  D=M-1,A(C)=N  

  ,A$(M)=J$  

111:PRINT "#NFIE  

  LDS";A$(D)  

115:FOR K=BTO M-  

  2STEP 2:C=  

  INT ((K-B)/2  

  )+1:PAUSE "F  

  IELD NO. ";  

  USING "###";  

  C  

120:GOSUB 10:  

  NEXT K  

140:INPUT "VERIF  

  Y ? <YES>";P  

  $:GOTO 180  

149:GOSUB 2  

150:FOR K=BTO M-  

  2STEP 2:
  
```

```

GOSUB 4  

155:INPUT "<OK>"  

,P$:GOTO 210  

165:NEXT K:GOSUB  

  1  

180:PRINT "#HEAD  

  ER";A(B)  

190:INPUT "ENTER  

  <FILER> TAP  

  E";P$  

195:CHAIN "FILER  

  2"  

210:GOSUB 10:  

  PRINT "=="  

  K=K-2:GOTO 1  

  65
  
```

```

101:O=M,M=153:  

  FOR K=OTO 2N  

  :A$(M-3N+K)=  

  A$(O-2N+K):  

  NEXT K:B=M-N  

102:INPUT "CREAT  

  E/<RETRIEVE>  

  ",P$:GOTO 10  

  5  

103:GOTO 160  

105:INPUT "ENTER  

  <DATA> TAPE  

  ",P$  

110:INPUT "NO. O  

  F RECORDS > "  

  IC  

115:FOR K=1TO C:  

  J=B:FOR E=M-  

  3N+1TO B-2  

  STEP 2:T$=A$(  

  E),I$=A$(E+  

  1):J=J+1  

120:PAUSE "REC"  

  :USING "###"
  
```

FILE2

NEW RELEASE — NEW RELEASE — NEW RELEASE — NEW RELEASE

SUPER 5—CPA80 QUALITY PRINTER

The new CPA80 printer supersedes the CP80. It is an attractive, efficient and versatile printer which allows you to print text and graphic in a wide range of print styles and languages.

SPECIFICATIONS

1. FUNCTIONAL SPECIFICATIONS

Printing method: Serial impact dot matrix.

Printing format: Alpha-numeric—7x8 in 8x9 dot matrix field. Semi-graphic (character graphic)—8x8 dot matrix.

Bit image graphic—Vertical 8 or 9 dots parallel, horizontal 640 dots serial/line.

Character size:

Normal size—2.22(W)x2.8(H)mm=0.087"x0.11"

Condensed size—1.11(W)x2.8(H)mm=0.044"x0.11"

Enlarged size—4.44(W)x2.8(H)mm=0.175"x0.11"

'ELITE' size—1.8(W)x2.8(H)mm=0.07"x0.11"

Enlarged 'ELITE'—3.6(W)x2.8(H)mm=0.14"x0.11"

Super/subscript—2.22(W)x1.4(H)mm=0.087"x0.055"

Semi-graphic unit—2.54(W)x2.8(H)mm=0.1"x0.11"

Character sets: ASCII characters—192 (96 normals and 96 italics). JIS characters—160 (64 katakanas and 96 alphanumerics). Semi-graphic units—103. International

Specials—2 for U.S.A., 1 for U.K., 8 for German, 8 for French, 4 for Swedish, 2 for Italian, 6 for Spanish, 48 for Greek, 6 for Danish and 2 for Japan.

Printing speed: 100 C.P.S. for normal size print. 200ms for line feed.

Columns/line: Normal—80 columns.

Condensed—142 columns. Enlarged—40 columns.

Condensed/double width—71 columns.

'ELITE'—96 columns. Enlarged 'ELITE'—48 columns.

Printing direction: Text and semi-graphic—Bi-directional, logic seeking. (programmable). Super/subscript and bit image graphic—Unidirectional, left to right.

Line spacing: 6 L.P.I.—4.23mm. 8 L.P.I.—3.18mm.

Programmable in increments of 0.35mm (1/72") and 0.118mm (1/216").

Paper feed: Adjustable sprocket feed and friction feed.

Paper type: Fanfold. Single sheet. Roll paper. Thickness—0.05mm (0.002") to 0.25mm (0.01"). Paper width—101.6mm (4") to 254mm (10").



Number of copies: Original plus 2 copies by normal thickness paper.
 2. MECHANICAL SPECIFICATIONS
 Ribbon: Cartridge ribbon (exclusive use), black.
 Dimensions: 384(W)x315(D)x125(H)mm without knob and connectors.
 Weight: Approximately 5.0kg
 Power requirement: 40W
 Temperature: Operating—5 to 35°C=41 to 95°F.
 Storage—minus 30 to 70°C=minus 20 to 158°F.
 Humidity: Operating—10 to 80 per cent RH, no

condensation. Storage—5 to 85 per cent RH, no condensation.
 Shock: Operating—1G (less than 1msec.). Operating—0.25G, 55Hz max. Storage—0.5G, 55Hz max.
 MTBF: 8 million lines (excluding printer head life).
 Printer head life: Approximately 30 million characters (replaceable).
 3. OTHERS
 Expandable RAM buffer: 2 kilobytes or 4 kilobytes—Option.
 16 bits Hex. dump mode:
 Self test modes: 2 types of test modes

IMPORTED AND DISTRIBUTED BY
MULTITECH COMPUTERS
 202 HIGH ST., NORTHCOTE. PHONE (03) 489-0430

PARSER

```

1:PRINT "====="
  :RETURN
9:A=A*(E-3);C
  $=A*(E-1)
10:IF I$="N"LET
  B=A(E-2);
  PRINT USING
  ;"<F$>";
  PRINT Q$;A$;
  " ";B:GOTO 1
  2
11:B=A*(E-2);
  PRINT "<F$>";
  ;">":PRINT Q
  $;A$;";B$
12:PRINT C$;
  :RETURN
100:"A"Q$=" "
120:PAUSE "ENTER
  SEARCH SPEC
  ";E=27;H=0
130:INPUT "$SPEC
  >";A$(E);
  GOTO 134
131:GOTO 500
132:INPUT "#SPEC
  >";A(E);
  GOTO 134
133:GOTO 500
134:GOSUB 140+5H
  :E=E+1;H=H+1
  :IF H<4THEN
  138
135:H=0;GOSUB 9
138:IF H=2IF I$=
  "N"THEN 132
  
```

PROCESS

```

1:PRINT "====="
  :RETURN
2:"="IF A$(D)=
  "N"LET F=(S=
  T):RETURN
3:F=0:IF S$=T$
  LET F=1
4:RETURN
5:"<"F=(S<T):
  RETURN
6:">"F=(S>T):
  RETURN
7:"AND"=F=F*P:
  RETURN
8:"OR"=F=F+P:
  RETURN
10:GOSUB 1:
  PRINT USING
  "###";" REC
  #";K:FOR V=1
  TO N
12:D=M-3N+2V-1;
  G=M-N+V:
  USING "###"
13:IF A$(D)="N"
  PRINT V$;" "
  USING ;A(G)
  :GOTO 15
14:PRINT V$;" "
  ;A(G)
15:NEXT V:
  RETURN
100:"A"
101:O=M;M=106;B=
  M-N+1;Z=0:
  FOR K=2NTO 0
  STEP -1:A$(O-
  3N+K)=A$(O-
  3N+K):NEXT K
110:INPUT "ENTER
  <DATA> TAPE
  ",P$
120:INPUT "NO. 0
  F RECORDS >"
  ;C
130:FOR K=1TO 3:
  PRINT " ";
  NEXT K
  
```

```

139:GOTO 130
140:G=1
142:P=M-3N+2G;F$
  =A$(P);I$=A$(
  (P-1)):IF F$=
  A$(E)LET A(E
  )=G:RETURN
143:G=G+1:IF G>N
  BEEP 1:PAUSE
  A$(E);" <= N
  OF":E=E-1;H=
  H-1:RETURN
144:GOTO 142
145:V$=A$(E):IF
  V$=" "RETURN
146:IF V$=">"
  RETURN
147:IF V$="<"
  RETURN
148:BEEP 1:PAUSE
  V$;" "=NOP"
  :E=E-1;H=H-1
  :RETURN
150:RETURN
155:V$=A$(E):IF
  V$="AND"
  RETURN
156:IF V$="OR"
  RETURN
159:BEEP 1:PAUSE
  V$;" <= NLO":
  E=E-1;H=H-1:
  RETURN
500:A$(E)="*X",X
  =INT ((E-27)
  /4+.5);E=E+1
  :GOSUB 9:
  GOSUB 1:
  CHAIN "PROCE
  SS",100
  
```

SHARP PC

STATISTICS I

By C. Colle, Ingham Qld.

This program calculates, after entering two lists of data (x and y), the mean of x and y, the standard deviation of x and y, the slope of the line of best fit, the Y intercept and the correlation coefficient.
If you input an x value, you can obtain an estimate for y and vice-versa.
The equation of the line is y = ax + b (a being the slope, b the Y intercept).

To use the program, press the following:
SHFT S - to start
SHFT M - to get the Mean
SHFT D - to get the Standard Deviation
SHFT = - to get the Slope and Y intercept
SHFT L - for linear estimate
SHFT C - for Correlation Coefficient
The listing is for the use of the printer.

SAMPLE RUN

```

STATISTICS I
X= 15.
Y= 9.
X= 11.
Y= 17.
X= 9.
Y= 14.
X= 12.
Y= 8.
X= 17.
Y= 15.

X MEAN IS 12.80
Y MEAN IS 12.60

X S.D. IS 3.19
Y S.D. IS 3.91

SLOPE IS -0.18
Y INTERCEPT IS 14.92

LINEAR ESTIMATE
X VALUE: 10.00
Y ESTI.: 13.10

Y VALUE: 10.00
X ESTI.: 27.13

CORRELATION COEF
CORREL. COEFF. = -0.1480
  
```

```

10:"S"PRINT
  USING ;"STAT
  ISTICS I":
  CLEAR:BEEP
  1:INPUT "HOW
  MANY DATA?
  "N:FOR Z=1
  TO N
20:BEEP 1:INPUT
  "ENTER X ";X
  ;"ENTER Y ";
  Y:PRINT "X=
  ";X:PRINT "Y
  = ";Y
30:C=C+X;D=D+Y;
  E=E+X;F=F+Y
  Y;G=G+XY:
  NEXT Z
40:L=C/N;M=D/N:
  T=J((N-CC)/
  (N*(N-1)));S
  =J((NF-DD)/(
  N*(N-1)))
50:A=(NG-CD)/(N
  E-CC);B=(DE-
  CG)/(NE-CC):
  BEEP 2:END
  
```

```

60:"M"PRINT
  USING "###.##
  ";X MEAN I
  $;"L:PRINT
  "Y MEAN IS "
  ;M:END
70:"D"PRINT "X
  S.D. IS ";T:
  PRINT "Y S.D
  . IS ";S:END
80:"="PRINT "SL
  OPE IS ";A:
  PRINT "Y INT
  ERCEPT IS "
  ;B:END
90:"L"PRINT "LI
  NEAR ESTIMAT
  E"
95:BEEP 1:INPUT
  "X ESTIMATE
  <Y/N>";Z$
  THEN 120
100:IF Z$="Y"
  THEN 120
110:BEEP 1:INPUT
  "X VALUE ";H
  ;I=AH+B:BEEP
  
```

```

3:PRINT "X V
  ALUE: ";H:
  PRINT "Y EST
  I.: ";I:GOTO
  95
120:BEEP 1:INPUT
  "Y VALUE ";I
  ;H=(I-B)/A:
  BEEP 3:PRINT
  "Y VALUE: ";
  I:PRINT "X E
  STI.: ";H:
  GOTO 95
130:"C"PRINT "CO
  RRELATION CO
  EF";R=(G-CD/
  N)/(E-CC/N)
  *(F-DD/N))
140:BEEP 3:USING
  "###.###";
  PRINT "CORRE
  L. COEFF. "; "
  ;R:END
  
```

(670 BYTES)

STATISTICS II

By C. Colle, Ingham Qld.

```

STATISTICS II
5:Z=INT (10Z+.
  5)/10:RETURN
10:"Y"PRINT "VA
  RIANCE":
  CLEAR:USING
  "NO. OF SCORE
  S";N
30:FOR I=1TO N
40:BEEP 1:INPUT
  "SCORE";X
50:PRINT "SCORE
  ";I;" ";X
60:D=X-N;M=M+D/
  I;S=S+D*(X-M
  )
70:NEXT I;V=S/(
  N-1);E=J(V
  )
75:Z=M:GOSUB 5:
  M=Z;Z=S:
  GOSUB 5:S=Z:
  Z=V:GOSUB 5:
  V=Z;Z=E:
  GOSUB 5:E=Z
80:BEEP 3:PRINT
  "MEAN=";M:
  
```

```

PRINT "SUM 0
  F SQ. = ";S:
  PRINT "VARIA
  NCE = ";V
90:PRINT "STD. D
  EV. = ";E:END
110:"C"PRINT "CO
  RR. COEFFICIE
  NT":CLEAR
120:BEEP 1:INPUT
  "NO. OF PAIR
  S OF SCORES"
  ;N
125:PAUSE "ENTER
  PAIRS OF SC
  ORES"
130:FOR I=1TO N
140:BEEP 1:INPUT
  X;Y
150:PRINT "PAIR
  ";I;" ";X";
  ";Y";"
160:A=X-M;M=M+A/
  I;S=S+A*(X-M
  );B=Y-D;D=D+
  B/I;T=T+B*(Y
  -D);C=J(CABS
  (A))*J(CABS (
  B))
  
```

```

Label 'V' is used, after entering
one set of data (x), to find the
mean, the sum of least squares,
the variance and the standard
deviation.
Label 'C' is used, after enter-
ing two sets of data (x and y),
to find the correlation coeffi-
cient.
  
```

```

VARIANCE
SCORE 1. : 11.
SCORE 2. : 9.
SCORE 3. : 18.
SCORE 4. : 15.
SCORE 5. : 12.

MEAN= 13.
SUM OF SQ.= 50.
VARIANCE= 12.5
STD. DEV.= 3.5

CORR. COEFFICIENT
PAIR 1.:15.,19.
PAIR 2.:11.,17.
PAIR 3.:9.,14.
PAIR 4.:12.,8.
PAIR 5.:17.,15.

COR. COEF. = 0.27
  
```

(617 BYTES)



TECH PRINTERS GALORE

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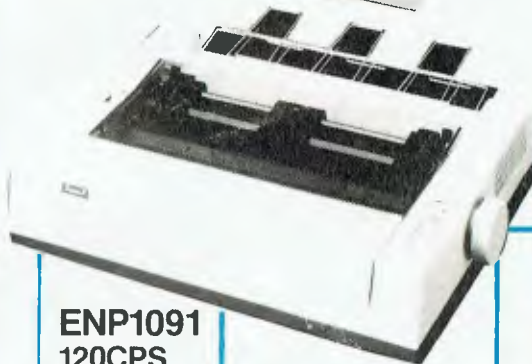


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MICROBEE

SPACECRAFT LANDER

By Stephen White, Elizabeth Park SA

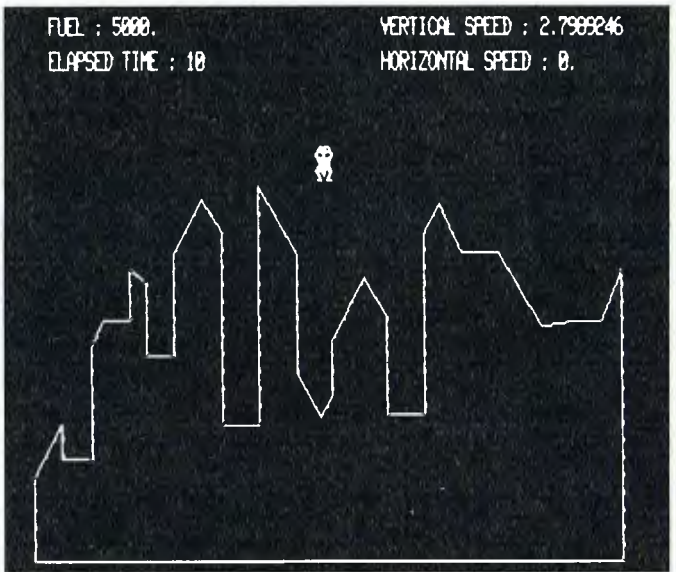
This program is about an alien city that has been attacked by the Klingons. (Didn't know that they had skip program drives!) You are given an old spacecraft to land in the city. The only trouble is that the spaceship flies like a real one. If you are hovering and you move the joystick left, the ship will keep on moving left until you move the joystick right.

Modifications

1. If you want to convert the program to work with keys then type:

```
DELETE 1260,1340
1260 A1$=KEY$
1270 IF A1$="Z" THEN LET R1=R1-10
1280 IF A1$="X" THEN LET R1=R1+10
1290 IF A1$="," THEN LET G1=G1-10
1300 IF A1$="." THEN LET G1=G1+10
2. If you think that the space ship moves too strongly, change all the
G1=G1-10 to G1=G1-4
G1=G1+10 to G1=G1+4
R1=R1-10 to R1=R1-4
R1=R1+10 to R1=R1+4
3. To get your brain out of gear, play this game!
```

```
00100 CLS
00110 CURS 2,0:PRINT "DO YOU WANT INSTRU
CTIONS?"(Y/N)
00120 A1=KEY$
00130 IF A1$="" THEN 120
00140 IF A1$="Y" THEN 1500
00150 OUT 0,0
00160 CLS:HRES
00170 DIM X(49),Y(49)
00180 PLOT 1,1 TO 1,38 TO 26,63 TO 26,47
TO 52,47 TO 52,99 TO 63,111 TO 84,111 T
O 86,135 TO 100,129 TO 100,95 TO 124,95
TO 124,142 TO 149,167 TO 166,152 TO 166,
63 TO 198,63 TO 198,173
00190 PLOT 198,173 TO 231,142 TO 231,87
TO 251,67 TO 261,77 TO 261,102 TO 289,13
1 TO 308,113 TO 308,68 TO 348,68 TO 348,
152 TO 353,165 TO 372,143 TO 404,143 TO
440,189 TO 459,110
00200 PLOT 459,110 TO 464,111 TO 492,111
TO 518,135 TO 510,1 TO 1,1
00210 FOR A=65200 TO 65200+(16*3)-1
00220 READ B
00230 POKE A,B
00240 NEXT A
00250 FOR F=1 TO 49
00260 READ X(F)
00270 NEXT F
00280 FOR G=1 TO 49
00290 READ Y(G)
00300 NEXT G
00310 D=1000
00320 S1=0.5
00330 T1=0.1
00340 W1=5000
00350 E1=0
00360 Q1=RND*5+1
00370 P1=RND*5+1
00380 H1=32
00390 U1=1
00400 G1=0
00410 R1=0
00420 N1=0:A1=H1:B1=U1:K1=1:L1=5:C1=0.5:
X1=1:M1=0:G1=0:R1=0:J1=0:U1=0
00430 E1=F1+G1+T1
00440 H1=(H1)+(F1+T1+G1)*T1/2)
00450 P1=Q1+(R1+S1)*T)
00460 U1=U1+(Q1+T1+(R1+S1)*T1/2):V1=V
1+0.5
00470 F1=E1:Q1=P1:W1=W1-(ABS(G1)*K1+ABS(
R1)*L1)
00480 R1=0:G1=0
00490 Z=0
00500 IF H1<1 THEN LET H1=1
00510 IF H1>63 THEN LET H1=63
00520 IF U1<1 THEN LET U1=1
00530 IF U1>15 THEN LET U1=15
00540 NORMAL:CURS(2):PRINT"FUEL ";W1
00550 CURS(66):PRINT"ELAPSED TIME ";INT
(U1)
00560 CURS(38):PRINT "VERTICAL SPEED ";
P1
00570 CURS(102):PRINT "HORIZONTAL SPEED
";E1:PCG
00580 IF W1=0 THEN 620
00590 NORMAL:CURS(192):PRINT"*OUT OF FUE
L* FREE FALL FROM HERE ON*":PCG
00600 H1=I1:W1=0:R1=0:G1=0
00620 IF N1=1 THEN 1010
00630 A=INT(A1):B=INT(B1)
00640 H=INT(H1):U=INT(U1)
00650 Z=0
00660 PCG
00670 IF H<17 THEN 710
00680 IF H<33 THEN 700
00690 IF H<49 THEN 840
00700 IF H<64 THEN 910
00710 FOR F=1 TO 12
```



```
01370 B1=U1
01380 GOTD430
01420 DATA 31,35,127,195,193,127,49,31
01430 DATA 26,53,181,218,98,49,24,124
01440 DATA 248,136,252,134,6,252,24,248
01450 DATA 176,88,76,158,148,24,48,124
01460 DATA 0,0,0,0,0,0,0,0
01470 DATA 0,0,0,0,0,0,0,0
01480 DATA 1,2,3,4,6,7,10,11,12,13,15,16
,17,18,19,20,21,24,25,26,27,28,29,30,31,
32,33,34,35,36,37,38,39,42,43,44,45,46,4
7,51,52,53,54,55,56,57,61,62,63
01490 DATA 13,13,13,13,10,8,0,0,0,7,7
,6,6,6,6,7,6,6,6,6,7,7,11,12,10,9,8,8,
8,9,9,7,6,6,6,7,7,8,8,9,9,10,10,9,9,8,
8
01500 B1$=KEY$:IF B1$="" THEN 1500
01510 CLS
01520 CURS 6,2:PRINT "DO YOU WANT TO PLA
Y AGAIN?"(Y/N)
01530 A1$=KEY$:IF A1$="" THEN 1530
01540 IF A1$="Y" THEN HIRES:RESTORE:GOTD
180
01550 CLS
01560 CURS 5,7:PRINT "BYE' THANKS FOR PL
AYING'!"
01570 END
01580 CLS
01590 PRINT " This is a program that i
s similar to Lunar Lander but has a
01600 PRINT "different reason. You don't
try to land on the moon, you try to"
```

```
01610 PRINT "stop a war and save the las
t humans in the universe. Since the"
01620 PRINT "Klingons have destroyed all
Landers except for the museum"
01630 PRINT "model, you haven't got an a
utomatic Lander. You have to land it"
01640 PRINT "yourself."
01645 PRINT "HIT ANY KEY TO CONTINUE";
01650 A1$=KEY$:IF A1$="" THEN 1650
01660 CLS
01670 UNDERLINE
01680 CURS(24):PRINT "TO PLAY THE GAME"
01690 PRINT "1.) YOU HAVE TO LAND AT ONE
OF THE FLAT PLACES ONCE."
01700 PRINT "2.) YOU ONLY HAVE ONE SHIP
TO DO ALL OF THAT."
01710 PRINT "3.) WISH YOURSELF LUCK BECA
USE YOU WILL NEED IT."
01715 CURS 3,15:PRINT "HIT ANY KEY TO ST
ART GAME";
01720 FOR A=1 TO 200
01730 A1$=KEY$
01740 IF A1$="" THEN 150
01750 NEXT A
01760 INVERSE
01770 FOR A=1 TO 200
01780 A1$=KEY$
01790 IF A1$="" THEN 150
01800 NEXT A
01810 UNDERLINE
01820 GOTD 1720
01830 END
```

BANNER

By Scott Tester (age 11)

```
00100 REM Banner, by S. Tester editor J. Tester
00110 CLS
00120 REM
00130 REM get word(s)
00140 CURS 28,0:PRINT "Banner"
00150 CURS 25,9:PRINT "By S. Tester"
00160 PRINT:INPUT"Word?":A1$=LEN(A1$)
00170 IF A1$="" OR A1$=" " THEN 100
00180 DIM A(Z),B(B),C(C),L(LZ)
00190 REM
00200 REM data numbers
00210 DATA 128,64,32,16,8,4,2,1
00220 FOR D=1 TO 8:READ B(D):NEXT D
00230 FOR D=1 TO 2
00240 C(D)=ASC(A1$(D)):D=0)+16+63488
00250 NEXT D
00260 INPUT"turn on printer then press RETURN"Z15
00270 FOR D=4 TO 16
00280 FOR E=1 TO 2
00290 A(E)=PEEK(C(E)+D-1):L(E)=PEEK(C(E)+D-7)
00300 NEXT E
00310 FOR E=1 TO 2
00320 FOR F=1 TO 8
00330 IF A(E)=B(F) THEN LET L(E)=L(E)-B(F):LPRINT" ";ELSE LPRINT A1$(E);E);A1$(E);E);
00340 NEXT F
00350 NEXT E
00360 NEXT D
00370 NEXT F
00380 NEXT E
00390 LPRINT
00400 NEXT D
00410 END
```

This program prints large letters on a printer. When running type in a word less than seven characters otherwise you will have to type the word again. (Scott, we know you're out there. Can you send us your address for payment please. EM)



ADDRESS BOOK

By Jon Barnett, Northmead NSW

The program itself uses around 8K of RAM. Approximately 10K is dedicated to variables. For those with 16K machines, make these changes.

STRS(10000) appearing in lines 290, 450, 870 to STRS(6000). This brings down the amount of string space reserved.

If your tape recorder can handle it, change all IN#2's to IN#3's and OUT#2's to OUT#3's. Data will be directed through device 3 (1200 baud cassette device).

The line containing IN#2 is 520.

The line containing OUT#2 is 750.

Because of the Microbee's non-volatile memory the variables and program will be retained in memory after turning the computer off. When the Bee is powered up again, GOTO 300 will get into the menu without destroying the file data.

CALL FILE: When the program prompts with "CONTINUE?", type CTRL G, else RETURN to continue.

SAVE FILE: To abort, enter CTRL G as the last character in the FILE NAME and then RETURN.

CREATE FILE: There is no way to abort! So don't create a new file unless you've saved the last file to tape!

EDIT FILE: When asked by the computer whether to 'IN-

SERT OR DELETE?' enter CTRL G to go to MENU, otherwise I for INSERT and D for DELETE.

In DELETE mode: when prompted for input respond with CTRL G as the last character typed, followed by RETURN. This gets you back to EDIT FILE menu.

In INSERT mode: the only chance to get out of this routine is when asked for the NAME of the person or when the NAME to be inserted matches that of an existing name in the file. In NAME entry respond with CTRL G as the last character input, then RETURN. This will return you to main menu. When "FILE EXISTS" message appears, type CTRL G to go to EDIT FILE menu, else RETURN to replace old data.

SEARCH FILE: To return from SEARCH FILE menu to main menu enter CTRL G.

In LISTING mode type CTRL G to go to SEARCH FILE menu.

In LIST SEARCH mode, when prompted for input respond with CTRL G as the last character entered followed by RETURN. The SEARCH FILE menu will then be displayed. After a successful SEARCH type CTRL G to get to SEARCH FILE menu. (Menu will destroy the address information displayed!)

```
00100 CLS
00110 CURS 24:1:PRINT"ADDRESS BOOK"
00120 CURS 25:4:PRINT"By JON BARNETT"
00130 CURS 27:7:PRINT"Copyright(C) 27/2/83"
00140 REM *****Indicated to my friend Grant,****
00150 REM though he always had the system could never
00160 REM remember their addresses.
00170 FOR A=1 TO 1
00180 PLAY 13:2114:2113:2111:219:216:6113:2114:2113:2111:219:218:1016:214:216:219:216:214:10
00190 PLAY 0:4113:2114:2113:2111:219:216:6113:2114:2113:2111:219:218:1014:216:219:14
00200 PLAY 0:8116:2116:216:218:16:10:8116:2116:216:214:2118:1610:6113:2114:2113:2111:219:216:6113:2114
:2113:2111:219:218:1013:4111:219:16:10
00210 FOR A=1 TO 1
00220 PLAY 4:229:2111:219:410:8111:4113:2111:2113:8113:4110:410:1218:2110:2111:410:8111:2113:2114:41
14:4114:4114:4114:2113:14:0:8
00230 NEXT A
00240 PLAY 13:2114:2113:2111:219:216:6113:2114:2113:2111:219:218:1016:214:216:219:216:214:10
00250 PLAY 0:4113:2114:2113:2111:219:216:6113:2114:2113:2111:219:218:1014:216:219:14
00260 PLAY 0:8116:2116:216:218:16:10:8116:2116:216:214:2118:1610:6113:2114:2113:2111:219:216:6113:2114
:2113:2111:219:218:1013:4111:219:16:10
00270 PLAY 13:2114:4118:1810:8113:2116:4118:10
00280 FOR A=1 TO 500:NEXT A
00290 S=12N=1:LISTEN(1000)
00300 CLS:PLAY 22
00310 INVERSE:PRINT"Commands available:";NORMAL
00320 CURS 30:1:PRINT"CALL FILE"
00330 CURS 30:2:PRINT"SAVE FILE"
00340 CURS 30:3:PRINT"CREATE FILE"
00350 CURS 30:4:PRINT"EDIT FILE"
00360 CURS 30:5:PRINT"SEARCH FILE"
00370 INVERSE
00380 FOR A=1 TO 10:A0A=STRN(A)CURS 45:A2:1:PRINT A0A:2:NEXT A
00390 A0A=KEY$IF A0A="" THEN A0 ELSE 300
00400 NORMAL
00410 A=INVAL(A0A):IF A=0 THEN GOTO 170 ELSE CLS
00420 ON A GOTO 430:450:850:910:1510
00430 INVERSE:CURS 26:1:PRINT"CALL FILE"PLAY 20:NORMAL
00440 CURS 27:4:INVERSE:PRINT"EDIT FILE";NORMAL
00450 A0A=KEY$:IF A0A="C" THEN CLEAR:STRS(10000):GOTO 470
00460 IF A0A="R" THEN 300 ELSE 450
00470 CURS 24:4:PRINT"ENTER FILE NAME";PLAY 10
00480 CURS 26:7:PRINT ( :INPUT"IA0A"
00490 IF LEN(A0A) > 1 THEN CURS 23:10:INVERSE:PRINT"FILE NAME TOO LONG";CURS 20:7:PRINT"REENTER";PLAY
23:NORMAL:CURS 29:7:PRINT"SPEC LEN A0A";GOTO 480
00500 CURS 20:7:PRINT"EA 32";CURS 23:10:PRINT"EA 32"
00510 CURS 25:10:INVERSE:PRINT"AWAITING FILE";PLAY 20:NORMAL
00520 IN#2:OUT#10:IN#10 OFF
00530 INPUT H0A:IF H0A<1:5) "*****" AND A0A H0A:1:1 THEN 530
00540 N=INT(VAL(H0A)/10):M=INT(A0A/100)
00550 INPUT H0A:A1$=H0A:G1$=M:G1$=A1$+G1$:G1$=A1$+G1$:G1$=A1$+G1$:G1$=A1$+G1$:G1$=A1$+G1$
00560 IF B=INT(VAL(G1$)/100) THEN NEXT B:G2$=A1$+G1$:G2$=A1$+G1$:G2$=A1$+G1$:G2$=A1$+G1$
00580 NEXT B
00590 IN#0:OUT#10
00600 CURS 27:13:INVERSE:PRINT"FILE LOADED";PLAY 20:NORMAL
```

```
00610 FOR D=1 TO 1000:NEXT R:GOTO 300
00620 IN#0:OUT#10
00630 CURS 23:13:INVERSE:PRINT"POOR FILE CONDITION";PLAY 23:NORMAL
00640 FOR B=1 TO 1000:NEXT R:GOTO 300
00650 CURS 27:1:INVERSE:PRINT"SAVE FILE";PLAY 20:NORMAL
00660 IF A=1 THEN CURS 29:7:INVERSE:PRINT"NO FILE";PLAY 23:FOR A=1 TO 300:NEXT A:GOTO 300
00670 CURS 20:4:PRINT"NAME FILE"
00680 CURS 26:7:PRINT ( :INPUT"IA0A:IF A0A=LEN(A0A) THEN GOTO 300
00690 IF LEN(A0A) > 1 THEN CURS 23:10:INVERSE:PRINT"FILE NAME TOO LONG";CURS 20:7:PRINT"REENTER";PLAY
23:NORMAL:CURS 29:7:PRINT"SPEC LEN A0A";GOTO 480
00700 CURS 20:7:PRINT"EA 32";CURS 23:10:PRINT"EA 32"
00710 CURS 24:10:INVERSE:PRINT"START RECORDING";PLAY 20:NORMAL
00720 CURS 20:13:PRINT"ENTER";SPEC 1:INVERSE:PRINT"RETURN";NORMAL:PRINT" WHEN READY"
00730 IF KEY$="CHR(13)" THEN 730
00740 CURS 20:13:PRINT"EA 32";CURS 26:13:INVERSE:PRINT"NOW SAVING";PLAY 20:NORMAL
00750 OUT#2
00760 FOR A=1 TO 3:PRINT"XXXXXXXXXXXXXXXXXXXXXXXXXXXX";NEXT A
00770 PRINT"*****";IS N:IA0A
00780 FOR A=0 TO 11
00790 PRINT" I 5 A1: " "IA1(O:0:A) " "IA1(1:A) " "IA1(2:A) " "IA1(3:A) " "IA1(4:A) " "IA1(5:A)
00800 NEXT A
00810 PRINT"???????"
00820 OUT#0
00830 CURS 25:13:INVERSE:PRINT"FILE RECORDED";PLAY 20:NORMAL
00840 FOR A=1 TO 800:NEXT A:GOTO 300
00850 CURS 25:1:INVERSE:PRINT"CREATE FILE";NORMAL
00860 CURS 24:4:INVERSE:PRINT"CLEARING MEMORY";PLAY 20:NORMAL
00870 CLEAR:STRS(10000):M=1:MIN A1$=100:FOR A=0 TO 5:FOR B=0 TO 100:A1$+B:="":NEXT B:NEXT A
00880 CURS 24:4:PRINT"EA 32";CURS 28:4:INVERSE:PRINT"CLEARED";PLAY 20:NORMAL
00890 FOR A=1 TO 800:NEXT A
00900 CURS 25:1:PRINT"EA 32";CURS 26:4:PRINT"EA 32"
00910 CURS 26:1:INVERSE:PRINT"EDIT FILE";NORMAL
00920 IF S=1 THEN 850
00930 IF A=1 THEN INVERSE:CURS 22:4:PRINT"FILE INSERTION ONLY";PLAY 20:NORMAL:FOR A=1 TO 800:NEXT A
:GOTO 1230
00940 CURS 33:4:INVERSE:PRINT"INSERT OR DELETE?";PLAY 20:NORMAL
00950 A=ASC(KEY$)
00960 IF A=73 OR A=105 THEN 1230
00970 IF A=68 OR A=100 THEN 990
00980 IF A=7 THEN 300 ELSE 950
00990 CLS:CURS 26:1:INVERSE:PRINT"FILE DELETED";PLAY 20:NORMAL
01000 INVERSE:CURS 14:4:PRINT"REFERENCE";NORMAL
01010 CURS 26:4:PRINT"NAME";CURS 26:7:PRINT"ADDRESS"
01020 ENVERSE:CURS 30:4:PRINT"1";CURS 30:7:PRINT"2";NORMAL
01030 A0A=KEY$:IF A0A="" THEN 1030
01040 IF A0A="1" THEN 1070
01050 IF A0A="2" THEN 1100
01060 IF A0A="7" THEN 300 ELSE 1030
01070 INVERSE:CURS 1:10:PRINT"ENTER NAME";NORMAL:PRINT 1:CURS 11:10:INPUT"IA0A"
01080 IF A0A=LEN(A0A) THEN GOTO 1100
01090 F=0:GOTO 1130
01100 INVERSE:CURS 1:10:PRINT"ENTER ADDRESS";NORMAL:PRINT 1:CURS 14:10:INPUT"IA10"
01110 IF A0A=LEN(A0A) THEN GOTO 300
01120 F=F+1
01130 CLS:CURS 25:1:INVERSE:PRINT"FILE DELETED";NORMAL
01140 CURS 26:4:INVERSE:PRINT"DATA SEARCH";PLAY 20:NORMAL
01150 B=101
01160 FOR A=0 TO N:IF A0A=ASC(F:A) THEN LET B=A:NEXT A:170 ELSE NEXT A
01170 IF B=N THEN CURS 23:7:INVERSE:PRINT"DATA NON-EXISTENT";PLAY 23:NORMAL:GOTO 910
01180 CURS 24:7:INVERSE:PRINT"FOUND";PLAY 20
01190 IF M=0 OR B=N THEN FOR A=0 TO 5:ASC(A):="":NEXT A:GOTO 1210
01200 FOR A=0 TO N:IF A0A=ASC(A:INT(C:1):N) THEN GOTO 1210
01210 CURS 29:7:PRINT" A DELETED";PLAY 20:NORMAL:IN#N-1
01220 FOR A=1 TO 500:NEXT A:GOTO 910
01230 CLS:CURS 25:1:INVERSE:PRINT"FILE INSERT";PLAY 20:NORMAL
01240 IF M=100 THEN CURS 28:4:INVERSE:PRINT"FILE FULL";PLAY 23:FOR A=1 TO 1000:NEXT A:GOTO 300
01250 INVERSE
01260 CURS 1:3:PRINT"NAME"
01270 CURS 1:5:PRINT"ADDRESS"
01280 CURS 1:7:PRINT"STATE"
01290 CURS 1:9:PRINT"COUNTRY"
01300 CURS 1:11:PRINT"POSTCODE"
01310 CURS 1:13:PRINT"PHONE NO."
01320 NORMAL
01330 CURS 5:3:PRINT ( :INPUT"IA0A:IF A0A=LEN(A0A) THEN GOTO 300
01340 B=101:N=1:FOR A=0 TO 5:ASC(A:INT(C:1):N) THEN LET B=A:NEXT A:160 ELSE NEXT A
01350 FOR A=0 TO N:IF A0A=ASC(A:0:A) THEN LET B=A:NEXT A:160 ELSE NEXT A
01360 IF B=101 THEN LET B=N:GOTO 1440
01370 B=0:IF B=0 THEN LET B=1
01380 FOR A=N TO B:STEP-1:FOR C=0 TO 5:ASC(A:INT(C:1):N) THEN LET C=NEXT A
01390 LET A2A=KEY$:IF A2A="CHR(7)" THEN 1210
01400 IF A2A="CHR(13)" THEN 1440 ELSE 1380
01410 FOR A=0 TO N:IF A0A=ASC(A:0:A) THEN LET B=A:NEXT A:1410 ELSE NEXT A
01420 B=0:IF B=0 THEN LET B=1
01430 FOR A=N TO B:STEP-1:FOR C=0 TO 5:ASC(A:INT(C:1):N) THEN LET C=NEXT A
01440 A1(O:0:A)=A0A
01450 CURS 10:5:PRINT ( :INPUT"IA1(1:B)
01460 CURS 6:7:PRINT"IA1(2:B)
01470 CURS 8:9:INPUT"IA1(3:B)
01480 CURS 9:11:INPUT"IA1(4:B)
01490 CURS 10:13:INPUT"IA1(5:B)
01500 FOR A=1 TO 800:NEXT A:CL5:GOTO 910
01510 CLS:CURS 25:1:INVERSE:PRINT"SEARCH FILE";PLAY 20
01520 IF A=1 THEN CURS 28:4:PRINT"NO FILE";PLAY 23:NORMAL:FOR A=1 TO 600:NEXT A:GOTO 300
01530 CURS 20:4:PRINT"MODE";NORMAL:CURS 25:4:PRINT"1";CURS 25:7:PRINT"SEARCH"
01540 INVERSE:CURS 37:4:PRINT"1"
01550 CURS 37:7:PRINT"2";NORMAL
01560 A0A=KEY$:IF A0A="" THEN 1560
01570 IF A0A="1" THEN PLAY 20:GOTO 1600
01580 IF A0A="" THEN 1590
01590 IF A0A="7" THEN 1590
01600 C=0
01610 CLS:INVERSE:CURS 28:1:PRINT"LISTING";CURS 1:3:PRINT"NAME";IF R=1 THEN LET R=0:RETURN
01620 NORMAL:CURS 7:3:PRINT"AL(O:C)
01630 A0A=KEY$:IF A0A="" THEN 1630
01640 IF A0A="1" THEN CURS 7:3:PRINT"1";R:1:GOSUB 1610:IF C=N THEN LET C=N
01650 IF A0A="2" THEN CURS 7:3:PRINT"2";R:1:GOSUB 1610:IF C=N THEN LET C=C-1 THEN LET C=0
01660 IF A0A="CHR(7)" THEN 1510
01670 IF A0A="CHR(13)" THEN 1620
01680 CURS 1:5:PRINT"ADDRESS"
01690 CURS 1:7:PRINT"STATE"
01700 CURS 1:9:PRINT"COUNTRY"
01710 CURS 1:11:PRINT"POSTCODE"
01720 CURS 1:13:PRINT"PHONE NO."
01730 NORMAL:CURS 10:5:PRINT"AL(1:C)
01740 CURS 8:7:PRINT"AL(2:C)
01750 CURS 10:9:PRINT"AL(3:C)
01760 CURS 11:11:PRINT"AL(4:C)
01770 CURS 12:13:PRINT"AL(5:C)
01780 GOTO 1620
01790 CLS:INVERSE:CURS 26:1:PRINT"LIST SEARCH";PLAY 20
01800 CURS 1:3:PRINT"ENTER NAME";NORMAL
01810 CURS 12:3:INPUT"IA0A"
01820 IF A0A=LEN(A0A) THEN GOTO 1510
01830 B=101
01840 FOR A=0 TO N:IF A0A=ASC(A:0:A) THEN LET B=A:NEXT A:1810 ELSE NEXT A
01850 IF B=101 THEN CURS 27:5:INVERSE:PRINT"NOT FOUND";PLAY 20:NORMAL:FOR A=1 TO 500:NEXT A:GOTO 171
01860 CURS 1:3:PRINT"SPEC LEN A0A";GOTO 1810
01870 PLAY 20:CURS 1:3:PRINT"NAME"; "IA1(O:B)
01880 CURS 1:5:PRINT"ADDRESS"; "A1(1:B)
01890 CURS 1:7:PRINT"STATE"; "A1(2:B)
01900 CURS 1:9:PRINT"COUNTRY"; "A1(3:B)
01910 CURS 1:11:PRINT"POSTCODE"; "A1(4:B)
01920 CURS 1:13:PRINT"PHONE NO."; "A1(5:B)
01930 IF KEY$="CHR(7)" THEN 1930 ELSE 1510
```

TRS-80

GRAND RACER

(For Level 2, 16K, Model 1)

Peter J. Holliday, Nathan Qld.

Grand Racer is a game written in machine language which simulates a Formula one race. The aim is to get as much score as possible and to go as fast as possible. There are many cars on the road that you have to

manoeuvre past by either using the control keys or an alpha joystick. There is a high score kept and realistic sound effects.

Grand racer can be used with disk systems as it stands. An editor/assembler is needed so

the left hand margin can be poked directly into the corresponding memory.

Control Keys:
 dn arrow = accelerator
 up arrow = brake
 > = right
 < = left

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MC/R/030/R

The educational computer that act

In this classroom, the teacher (master station) has access to every student (work station).

All students can share the one program (subject) and work on it at their own pace.

Or every student can work on an entirely different program.

So, one student can progress to a highly advanced level while the student next door happily tackles a more basic program.

(There is a vast array of educational programs designed for the system. And not just on computing, but right across the school curriculum.)



The BBC computer is the only computer in the world that was created specifically for education.

It works perfectly in a classroom because it was designed in a classroom.

And not just any classroom, but the computer sciences facility at Cambridge University.

And leading the team were the creators of some of the most outstanding educational television in the world.

None less than the British Broadcasting Corporation.

The BBC, along with Acorn Computers Pty. Ltd., developed the system for the British Government to implement a major educational policy, the Computer Literacy Program.

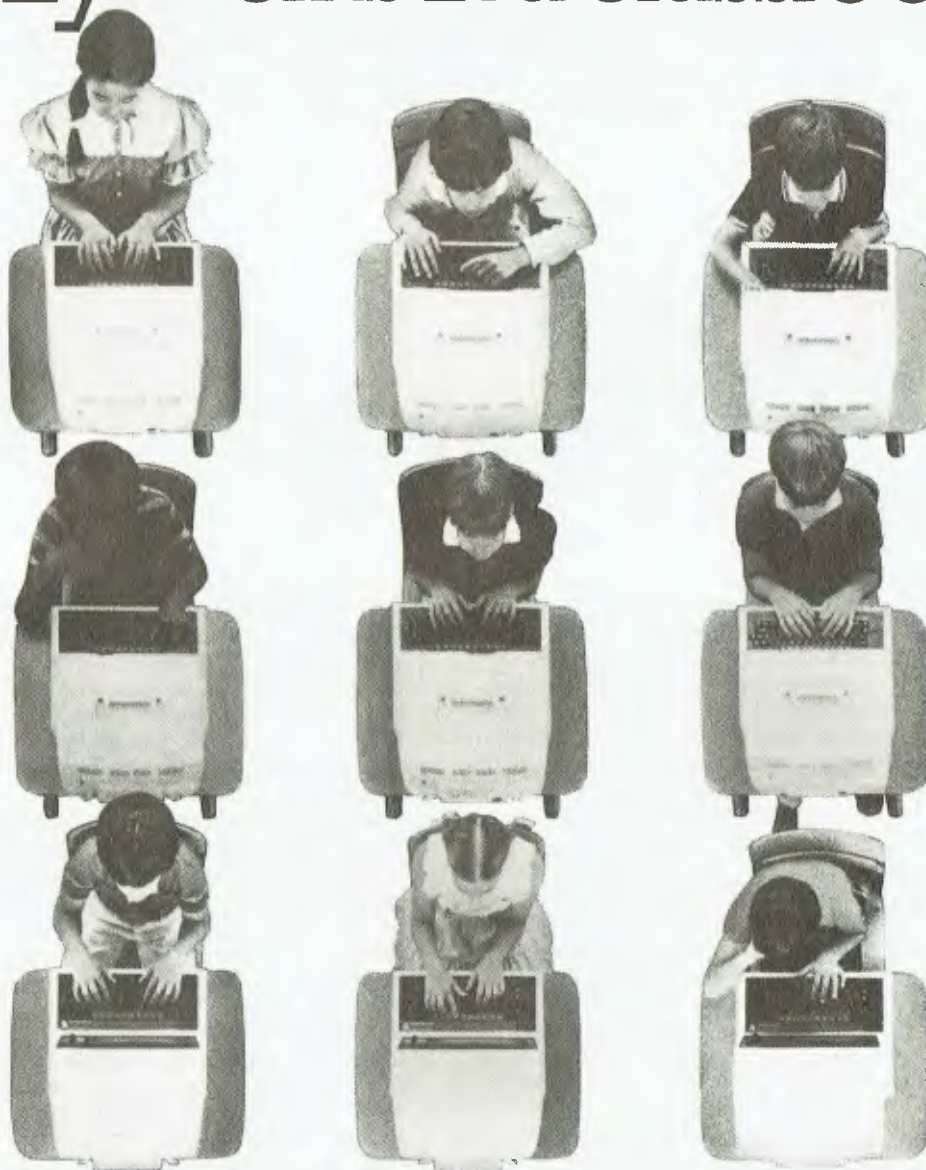
In doing so, they created a computer that could teach all computers a thing or two about capability, expandability and networking.

A computer which is now used in over 80% of British schools.

And on approximately 5,000 desks in Australian schools.



ually works in a classroom situation.



Just like a normal classroom, the teacher can "talk" to the entire class at once.

Or choose to "look in" on a particular student's work, with or without them knowing.

The teacher can then offer help, or take complete control of the student's screen.

The system also does the job of the old exercise book, storing all students' work for later review and grading by the teacher.

In all, it works just like a typical classroom.

Except that everyone in the classroom is learning how to use a computer.

A computer recommended by six State Education Departments in Australia.

The Computer Literacy Program also generated teacher training programs, a library of understandable computer literature, a vast range of quality educational software and a television series directed at schools.

All of which we have in Australia, now.

Together with the computer the BBC proudly put their name to. The BBC.

The BBC Microcomputer is brought to Australia by Barson Computers, Australia's leading independent computer company.

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BARSON COMPUTERS



Equipped with clear objectives and his usual cool approach, Frank Lee breezed through a sweltering edition of the US National Computer Conference. Despite an apparent dearth of titillatingly new technological trickery, he found plenty to write about.

Viva Las Vegas!

IT TOOK innate genius to plant the 1984 US National Computer Conference in the most inhospitable environment known to man. Clearly, the environmental experiments of NCC 1983 established the necessary groundwork for the unbelievable torture so appropriate to this Orwellian Year.

Regular *Your Computer* readers may recall the Great Anaheim Tent Disaster of 1983. A half-dozen rows of air-filled incubators disguised as tents effectively cooked both exhibits and exhibitors under the California summer sun. It was, of course, a preplanned obstacle course for both man and machine. The cover story said that the air conditioning had broken down. We know better, for now the NCC organising committee has revealed its hand. In the subterfuge and cover story. For here in the midst of the Mojave Desert wastelands, in the most God-forsaken city in the world, lay NCC 1984.

Las Vegas, it must be understood, is hot. Very hot. Hot and dry. To venture outside one's hotel in this environment is to pit your body against all that is alien to terrestrial life.

Forgive the diatribe. I'm still cooling off. For in spite of it all, this mid-summer, mid-desert NCC worked. The air conditioning didn't break down and the organisation was superb.

Missing from this year's NCC were the familiar winding waiting lines of those who failed to register early. Whereas in 1983 one may have

expected queuing delays of up to an hour, most registrants were forced to wait no more than 15 minutes. A score of Grey Line buses shuttled participants back and forth between hotels and the Conference Centre on a continuous basis. Exposure to the elements was minimized to the necessities of transferring from hotel to shuttle and back again.

The Conference was divided between a large exhibition area and the East Meeting Rooms where the technical programs and seminars were held. The exhibition area was neatly structured into four contiguous rectangles accessed by row and column. An overflow exhibition area was located in the nearby Hilton.

Uncle Phil was here also, to present a paper on his latest brainchild which he calls FlowGuide (you might soon see an article on it in these pages). Technical presentations are really not my forte, but I'd have been drummed out of the family if I didn't attend. I'll spare you the second-hand version, except to mention that FlowGuide is a program-authoring system which runs on the IBM-PC. Uncle Phil says it can host a number of high-level languages, allowing the author to express the program logic at the flowchart level so the computer is left to churn out the source code.

Well, what's new at NCC? Frankly, not much. In fact the big surprise is that there were really no big surprises.

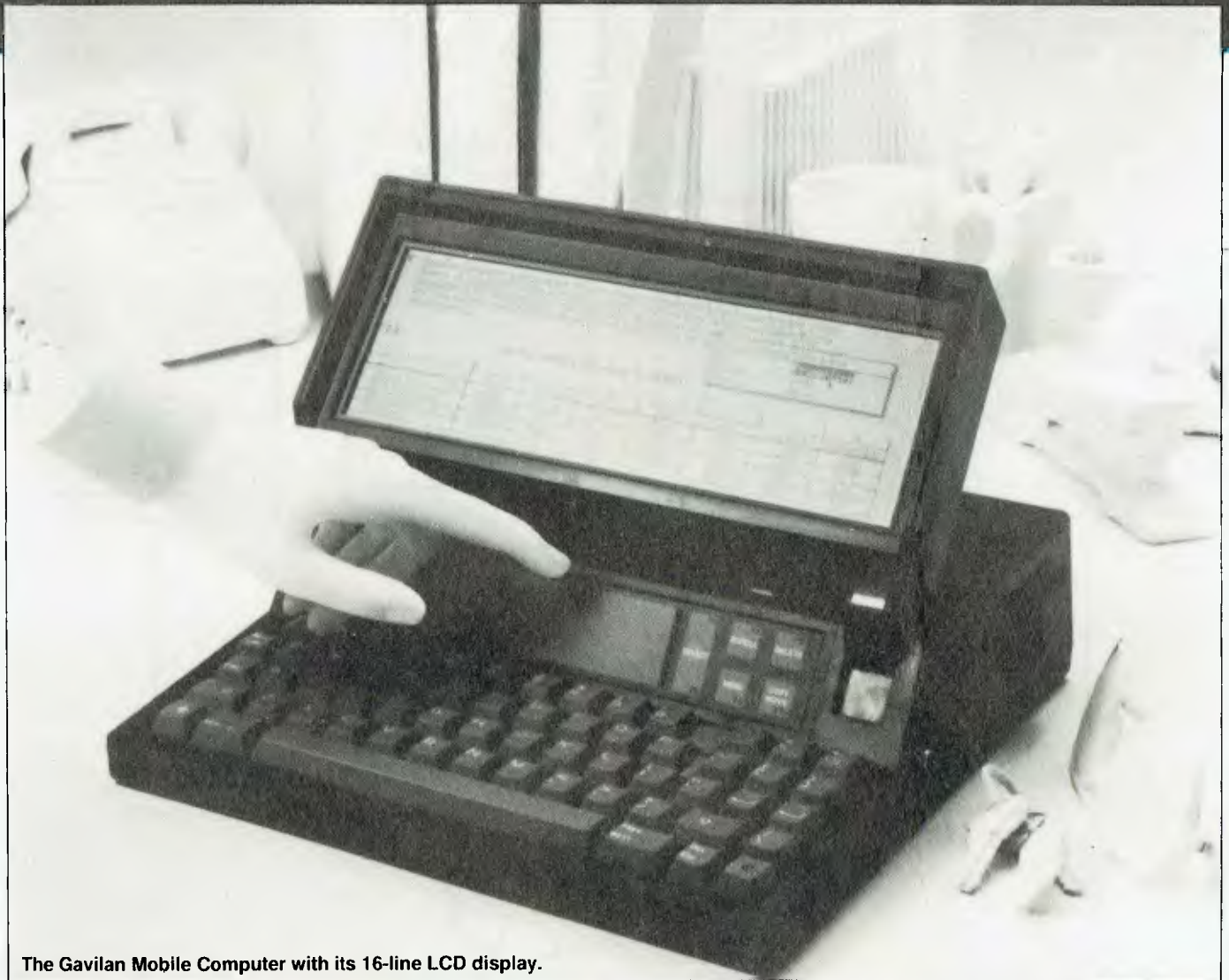
Of course the exhibition was Big. It always is, and it always seems to get bigger. To try to cover it in four days would be sheer folly. What with the

alternative attractions of Las Vegas, few delegates would be lucky to see even half of the available material. So far par for the course. The correct technique is to determine exactly what one wishes to see and to aim with steadfast resolve at those targets.

Following this dictum, I marked out a preferred route and circled the compulsory booths of IBM, Apple, Digital Research, Televideo, Gavilan, Columbia, Compaq, and of course the Aussie Trade pavilion. After running a 'short least path network algorithm' on my trusty MicroOffice RoadRunner (brought all the way from Oz), I traced the appropriate knight's tour. Most of the selected targets were exactly as expected: tastefully executed exhibition booths with oodles of freebies and attractive young things inviting one to "Ask Me". My question at each stand was "So what's new?"; to which the most common reply was, "Well, we're not exactly announcing products at NCC". On the other hand, quite a bit of stuff came out of the woodwork, as it were. The Gavilan is a case in point.

Gavilan's Mobile Computer

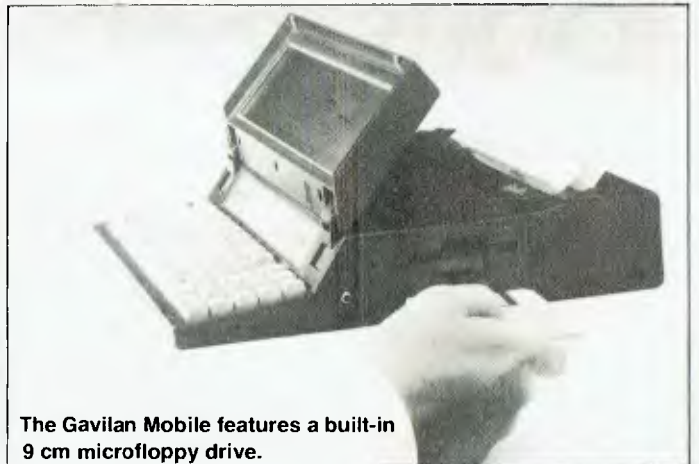
Twelve months ago, I wrote in these pages of the Gavilan briefcase computer: a machine which heralded a new concept in computing ergonomics. This year Gavilan sports not only its original offering (referred to now as the Gavilan SC), but a new souped-up version – the Mobile. This model has a 16-line LCD display, and 96K of RAM. The



The Gavilan Mobile Computer with its 16-line LCD display.



The Gavilan SC plus a 13 cm file transfer drive.



The Gavilan Mobile features a built-in 9 cm microfloppy drive.

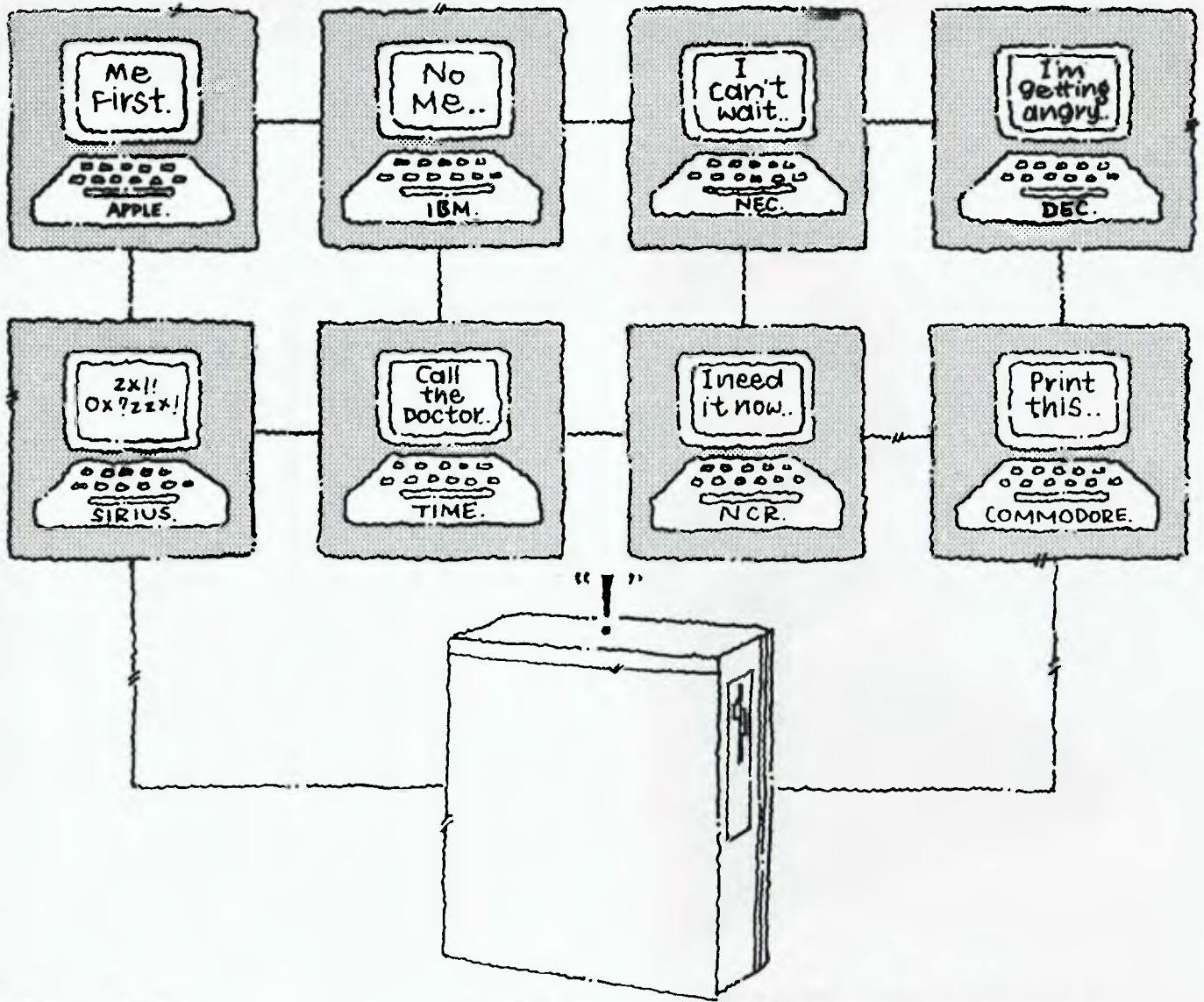
Gavilan SC may be upgraded from its original eight-line display for \$US795. The mobile unit began shipping in last June and production is expected to increase throughout summer.

For those interested in the technical details, both units offer a 360K micro-

floppy disk, bit mapped graphics, ten function keys, a "solid state mouse", numeric keypad, built-in modem, serial port, composite video output, and an optional IBM-style disk drive attachment. A docking printer module is available for under \$US1000. Maximum RAM capacity is 288K. The

Mobile Computer is equipped with 64K of internal ROM-based software, compared with 8K for the SC model. Both units weigh just under 4.5 kg.

The standard operating system is MS-DOS. Software supplied with the Mobile Computer includes MS BASIC, a spreadsheet, a word processor and



MODUS soothes PC tempers.

MODUS from ATAC.

An integrated multi-processor peripheral subsystem that provides up to 63 microcomputers with disk file and printer services.

MODUS means Access.

MODUS connects systems into a network over which microcomputers can access MODUS services and send messages to each other. Files can also be downloaded to MODUS from a mainframe. Data files can be accessed by more than one microcomputer at a time, allowing network users to share a common data base.

File access permissions are definable by the user and file read sharing is allowed and integrated by automatic file locking.

MODUS means Capacity.

The file storage capacity of MODUS hard disks is far greater than flexible disks of microcomputers providing from 10 to 60 megabytes of data storage on one to two disk units.

Control ware on MODUS is specifically designed to provide fast and efficient disk I/O services. Cache memory is standard on MODUS.

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a communications package. The SC model basic system price is \$2995 compared to \$3995 for the Mobile Computer. Gavilan management is optimistic about increasing sales for this particular market sector. Their 1983 figures suggest that briefcase computer sales represented approximately five per cent of total portable office personal computers in terms of retail value. They expect this figure to increase to 40 per cent by 1987, with a corresponding reduction in 'transportable' computers.

Radio Shack

Radio Shack was touting its Tandy 2000 high-performance MS-DOS machine announced earlier this year. The two-disk-drive version, which retails for \$2750, offers IBM-PC compatibility. Additional features and improved speed result from its use of an Intel 80186 microprocessor. Each disk drive supports 720K, yet is also capable of handling IBM formats. Its colour graphics can have twice the resolution of the IBM-PC's.

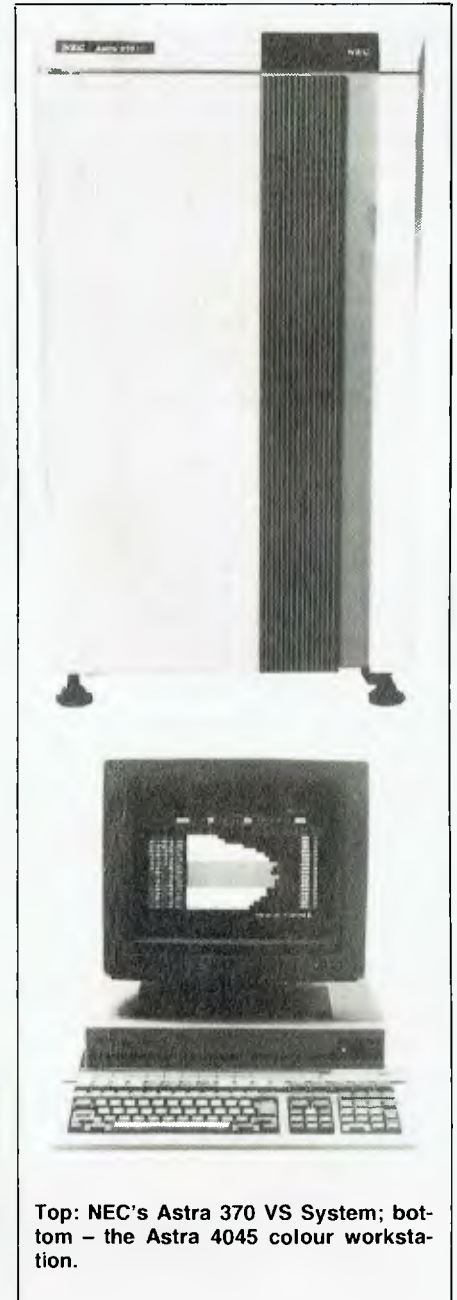
Amongst software now available for the Tandy 2000 is Lotus 1-2-3, which Radio Shack claims operates from

two to six times faster on the Tandy 2000 than on the IBM-PC, making this the fastest implementation yet on any personal computer. Unlike versions of 1-2-3 for other computers, the Tandy 2000 program is pre-installed with MS-DOS. In addition, this version allows 1-2-3 to use colour in the text mode. Colour is also used for highlighting in the help screens which the user may call up at any time when there is a question regarding the performance of a particular function. Eight colours are supported — double the number on the IBM-PC.

The TRS-80 Model 100 was loaned in quantity by Radio Shack as the official word processor for the NCC press room. Twelve model 100 computers and DMP-2100 printers were placed in the press room for the use of working journalists. Some chose to transmit their text files to the home office via the Model 100's built-in modem. Personally, I found it more convenient to pound out the goods on the RoadRunner back at the hotel, using its CMOS RAM cartridges for text storage. Its 80-column screen makes me feel much more at home when writing straight text.



Tandy's TRS-80 Model 2000 Personal Computer with 'ultra-high-performance' MS-DOS.



Top: NEC's Astra 370 VS System; bottom — the Astra 4045 colour workstation.

NECISA

Although slightly beyond the domain of those of us interested in single-user microprocessor-based systems, the NEC Astra 300 series announced at NCC looks very exciting. The Astra 300 is a 32-bit minicomputer using custom NEC chips said to deliver twice the performance and four times the storage capacity of present machines, at two thirds the price.

Priced from under \$US15,000, the ▶

SPECIAL REPORT

Astra supports up to 32 workstations and is compatible with the Astra 200 series introduced in 1979. NEC claims earlier software applications are readily transportable to the larger machine. The company also claims that the Astra 300 series delivers better price/performance than DEC's VAX series.

Apple

The Apple stand exhibited a gigantic working model of the Macintosh, but had few surprises apart from the Lisa 7/7 software and a wide range of third-party software offerings for the Macintosh.

Apple has announced a new version of its popular Apple Writer II word processing package, which is expected to be available in early August for the Apple IIe and IIc computers. Enhancements include horizontal scrolling, continuous display of text statistics, a built-in terminal mode, and a utility that enables users who do not have ProDOS to format disks for the new word processor.

Lisa 7/7 is an integrated software package for the Lisa personal computer. Expected to be available early in August, Lisa 7/7 combines fully integrated and enhanced versions of the seven original Lisa Office System applications into one software package. These include project management, word processing, a spreadsheet, data communications, a database, business graphics, and structured graphics. Apple claims this integration enhances the moving of data between functions. There is also a spelling checker, additional graph

types, and the spreadsheet is faster. High-quality colour printing is available on the Canon PJ-1080A ink-jet printer, in addition to black and white output on the Apple Daisy Wheel and Image Writer printers. According to an Apple spokesman, Lisa 7/7 offers a wider variety of useful business tools than any other integrated software package on the market.

Apple computer and over 60 independent developers demonstrated more than 80 software packages for the Macintosh and Lisa computers. I was told that products are currently under development by over 250 Macintosh developers. In addition, Apple has just introduced a new colour monitor for the Apple IIe and III personal computers.

Major products from ten independent developers were shown at regular intervals throughout the conference, on the three-metre-high version of a Macintosh computer. These products included Lotus Macintosh; a graphic database by Telos, called FileVision; Microsoft Chart Business Graphics; PFS; Market Manager; Odesta's Helix; Think Tank (an "idea processor") by Living Video Text; a stock market simulation game called Millionaire; and a Forth Development System called MacForth, by Creative Solutions.

Two new releases for the Macintosh deserve special mention. These are MacTerminal and Macintosh Pascal.

MacTerminal is a data communications package which allows the Macintosh to interact with remote machines and bulletin boards. Expected to be available in late August, MacTerminal supports a wide variety

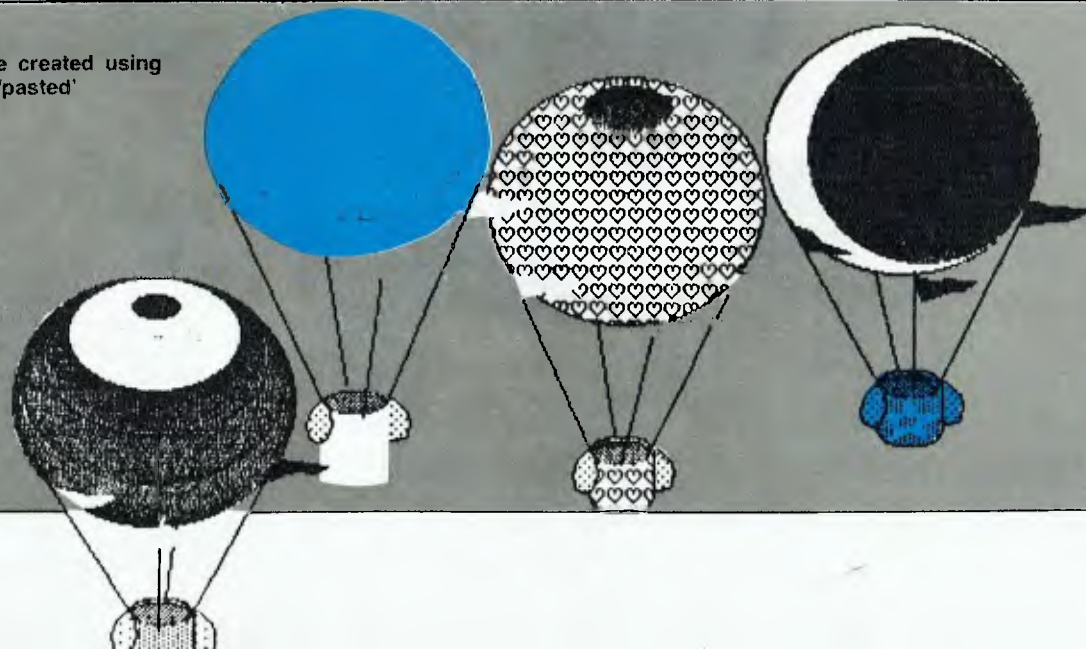
of commonly used communications protocols. In particular, it enables the Macintosh to emulate IBM 3278 terminals via the AppleLine coaxial attachment unit or the Apple Cluster Controller. When used with the Apple modem it provides asynchronous communications through VT100, VT52, and TTY terminal emulation.

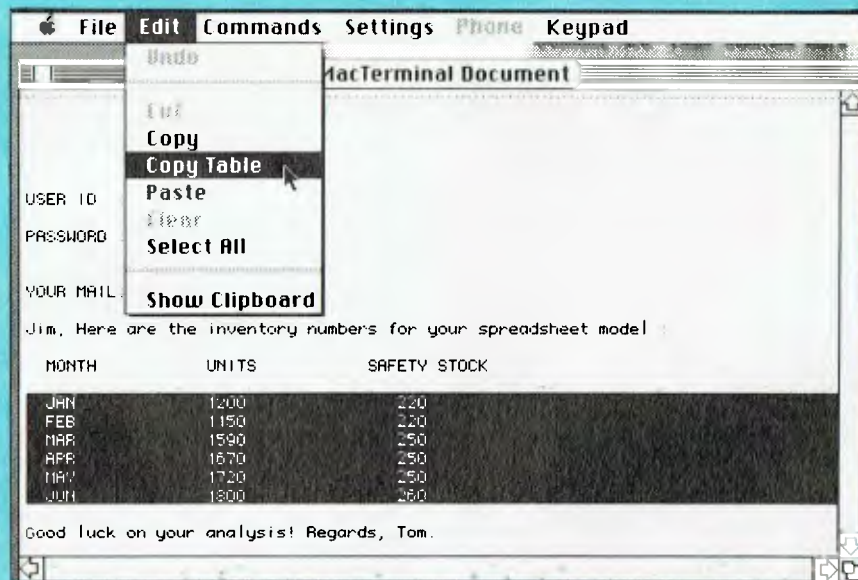
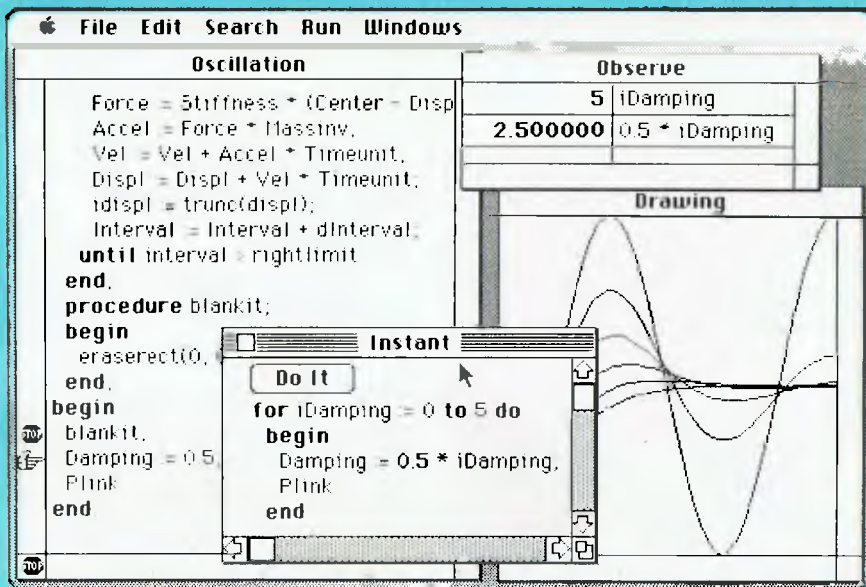
Macintosh Pascal is an interpretive Pascal designed specifically for the Macintosh. Announced at NCC on the opening day, this program is also expected to be available in late August. It promises an interactive programming environment ideal for students and novice programmers. The program is designed to provide immediate feedback, thereby speeding the learning process and reducing development time.

Macintosh Pascal allows the user to watch and interact with an executing program. The values of variables and expressions may be monitored during execution. The user may enter and execute any number of Pascal statements while program execution is temporarily suspended. Results of program modifications are seen immediately, thus enhancing the learning process and making it easier to locate and correct programming errors.

Each Pascal statement is checked for correct syntax as it is entered. When the program text is listed, a 'pretty-printing' feature provides for automatic indentation. The keywords are displayed in bold type. Users can also access the Macintosh Clipboard, Scrapbook and Note Pad while editing a program.

These balloons were created using LisaDraw, then 'cut/pasted' into LisaWrite.





Displays from Macintosh Pascal (above) and MacTerminal.

Available subsystems include the QuickDraw routines implemented in ROM, and a variety of mouse and keyboard event routines. Unfortunately, this release does not fully support all the Macintosh user interface features, such as menus, windows, and dialogue boxes.

The suggested retail price of Macintosh Pascal is \$US125. The package includes two disks, a User's Guide and Reference Manual.

AT&T and Digital Research

A joint statement by AT&T and Digital Research at NCC announced the availability of several DRI packages for the recently introduced AT&T

Personal Computer. These packages include DR Draw and DR Graph, as well as a number of language systems including PL/I, C, Pascal/MT+ and CBASIC.

AT&T also intends to offer DRI's Concurrent PC-DOS when it becomes generally available later this year. This version of CCP/M will support both CP/M and PC-DOS software in a common operating environment.

It will be interesting to follow up AT&T's impact on DRI in pushing the founder of CP/M UNIXward.

Columbia

Columbia Data Products' Advertising Manager, Jack Horner, invited me to

take the weight off my feet and swap yarns about Columbias.

I must confess at this time to having committed a shameless act of infidelity. Yes, Columbine (my faithful Columbia MPC) and I have parted, all over a foxy look-alike: the Fox 2010M. While awaiting delivery of the 2010M, a two-floppy version (the 2001) is occupying the desk space. Although a financially sensible move, I have yet to be convinced that the Fox is a match for the Columbia. There will certainly be problems of adaptation, but hopes are high. (Watch for a future review of the Fox.)

Jack Horner showed off the new Columbia Professional. Similar in many ways to the Compaq DeskPro Model 4, it has IBM compatibility, 640K of RAM, two floppy disk drives, a 10 Mbyte internal streaming tape back-up, colour graphics, a parallel port, and four available expansion slots. Unlike the Compaq, the Columbia Professional has two serial ports as standard. Further, MS-DOS is supplied with the hardware. All in all, a nice product. I'm hoping to be able to bring the Fox 2010M up to the same resource level.

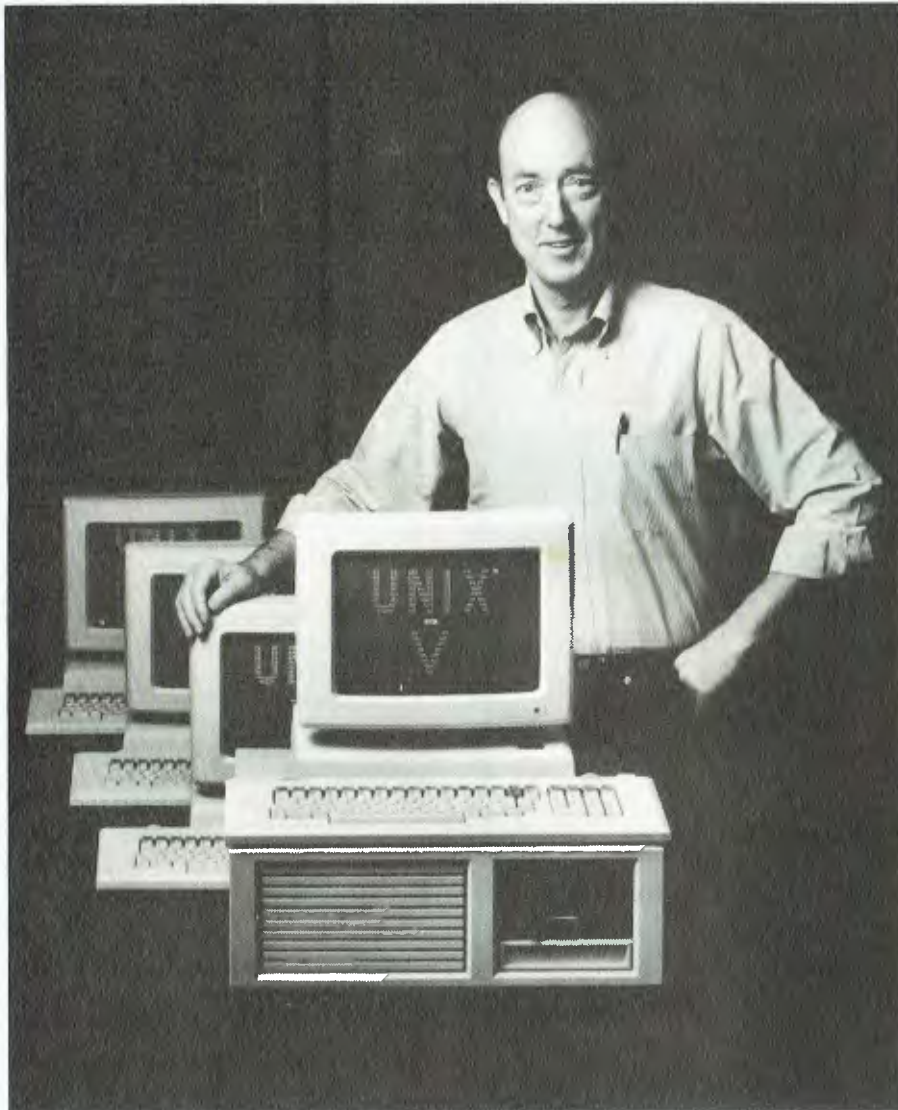
The Columbia Professional is selling for \$US5995.

The Lot From Down Under

The Aussie stand was located in the nearby Hilton. The only recognisable face was that of Dulmont's Terry Crews, bravely flogging a 16-line version of the Magnum 'briefcase' computer. The road to fame is strewn with rocks. Don't trip, Terry.

The consolidated Aussie brochure mentioned 23 different companies, including Eracom (where were you, Bill?), IMS, Dulmont, Datamax, Attache Software, Sybiz and BBJ.

Of special interest to me were the Datamax 816 computer, and BBJ's 'Today' software system. The Datamax 816 warrants a full review in a later article. BBJ has sold an equity interest to the US-owned Hewlett-Packard. 'Today' is said to be the world's first complete fourth-generation product for plant maintenance, supply, costing and financial applications. Some of its elegant refinements include dictionary basing, flexible report generation, training modes and foreign language capability.



The Morrow Tricep: "Brings UNIX per-user cost to under \$2500".

Morrow

I recall George Morrow's somewhat *sotto voce* soiree at last year's NCC, when he announced some exciting low-priced, high-performance goodies. Alas, the writing of this article prevented such gaddings about this time around. Nevertheless, Morrow's July 9 announcement "Morrow Enters 'SuperMicro' Arena with Tricep; Brings UNIX per-user cost to under \$2500" was a good stir. Morrow's Tricep supports four to eight users running UNIX System V on the 68000. Optional slave processor boards based on the 80188 CPU will also support MS-DOS applications.

I know Unix is some kind of weird

American religion which flourishes in universities and colleges, but to me it's just another four-letter word. It's the most appropriate antonym for 'user-friendly', making sense only in an extensive multi-user environment. But that, of course, is Morrow's target market. I nearly finished with a "Good luck, George", but Morrow never relies on luck.

IBM

The IBM stand was impressive as usual, and densely peopled with IBMers. I was impressed, but I still don't know with what I was impressed. They had run out of press kits, but promised to mail lots of good things

as soon as possible. Hence – this space left intentionally blank.

Televideo

This is one stand which I missed out on completely. It was on the planned route, but an attack of hunger took me momentarily off course. The Televideo 1605 and its portable baby brother are particularly interesting in that they claim high levels of IBM-PC compatibility. Since most of the programs which I tend to flog in my travels are designed for the IBM-PC, it was with considerable pleasure that I made the acquaintance of John Forster of Data Peripherals (Auckland, NZ) at the Computerworld reception on the first night of the conference. We had previously spoken by phone about arranging a demonstration of a particular program on the Televideo 1605 on my way through Auckland. As it happened, the software operated just fine on both the 1605 and the portable.

The program to which I refer is a medical package. It runs under PC-DOS and MS-DOS, but has an embarrassing number of direct calls to the system ROM in order to speed things up. Interestingly, I have yet to find a PC clone which falls over when running the program, in spite of the fact that all the good books tell us to avoid ROM calls in preference to well-defined operating system calls. The fact is, the ROM software must necessarily differ from clone to clone, since each is subject to copyright. However, the entry points are substantially standard. In CP/M-80, the BIOS can be accessed if you know where its jump table is located, since each jump table entry is a transfer to the appropriate function handler within the BIOS. Access to the ROM BIOS in a clone is performed by executing software interrupts. Only when the clone designers manage to foul up the interrupt mechanism, or disregard the functionality of a particular function handler, will incompatibilities arise.

Well, once more – NCC was a blast. This time a furnace blast. Next year's National Computer Conference is scheduled for July 15-18, 1985; in Chicago, Illinois. The theme for the conference is 'Technology's Expanding Horizons'. If I've cooled down by then ... □

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Here's an exciting new offer which applies until November 30, 1984: if you take out a new subscription to *Your Computer*, or renew your existing subscription, you could win an exciting Casio Personal Computer valued at \$99.95! Until the end of November 1984, all subscription cards we receive each month will be put into a barrel, and THREE lucky subscribers each month will win an exciting Casio PB-100 Personal Computer valued at \$99.95. That's right, a total of twelve PB-100s to be won!

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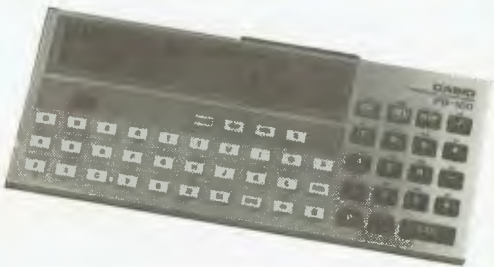
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At the heart of this system is the powerful Casio PB-700 Personal Computer, 'big brother' of the PB-100. This provides all the features of the smaller machine PLUS a much bigger LCD screen with four lines of 20 characters. The display can also handle graphics, with 160 by 32 pixel resolution. The PB-700 also features a much bigger program memory: 4 Kbytes come built in, with optional expansion up to 16K!

Along with the PB-700 itself, our grand prizewinner will get *both* the matching Casio FA-10 four-colour printer/plotter and the Casio CM-1 microcassette recorder. These provide the PB-700 with all the facilities to generate multi-colour 'hard copy' for both text and graphics, and to 'save' both programs and data quickly and reliably.

Normal recommended retail price for this complete system is over \$1000!

In the last instalment of this gripping series Les Bell looked at filling in a screen in dBase. This month he goes on to look at editing and string handling.

Getting dBest from dBase

APPENDING records to a database using the dBase 2.3 append technique is actually more complex than editing existing records, as we shall see. With dBase 2.4 it is particularly easy: just design a screen format field and then write in your code

```
* EDIT A RECORD
SET FORMAT TO EDIT
EDIT RECORD #
```

Of course, this will only work in 2.4 or later, and then only if you just want to edit fields as they are stored in the database.

However, quite often you want to maintain fields in the database in a format which would baffle the end user, or would be inconvenient to deal with. Take dates, for example.

Date Disorder

Dates are particularly inconvenient to deal with, particularly if you want to sort or index on them. Sorting assumes that the most significant characters in a value are at the left-hand end, and that decreasingly significant characters lie across to the right. In Australia, we just don't handle dates that way; instead we put them in the format dd/mm/yy, so the most significant characters are the seventh and eighth, the next most significant are the fourth and fifth, and the first and second characters are least significant of all (excepting the slashes, which have no significance).

In the US, the situation is similar, with an even less logical date format: mm/dd/yy. Why can't we be like the logical Swedes, who (I believe) write dates in the format yy/mm/dd?

PART X

Clearly, if we want to index or sort on dates, we must reformat them before writing them into the database, so they follow the rules of significance for sorting.

This can be done by forcing the user to enter the date with the digits in the appropriate positions, using the @...GET...PICTURE statement. This operates a bit like the BASIC PRINT USING statement, except in reverse. If we say in our code

```
@ 2,60 GET disdate USING '99/99/99'
```

dBase will display that field with a couple of slashes already in it, which the user cannot overtyp or move. Thus the user is forced to input the date in the right format. A date like 6/1/84 has to be entered as

```
<space> 6 <space> 1 8 4
or
6 <space> 1 <space> 8 4
with the first format the best one.
```

Furthermore, the '9' characters in the PICTURE statement indicate that only numeric input will be accepted, so the user cannot type '6 Jan 84', for example.

Having got our input with the characters in the right places, we can now reformat it to allow indexing. The neatest way to do this is with a simple one-liner:

```
STORE $(disdate,7,2)+$(disdate,4,2)+
$(disdate,1,2) TO mdate
```

which will turn the 'display format' date in disdate into a character string in the format yymmdd in mdate. This uses the '\$' substring extraction operator to pick out two characters at a time, starting at positions 7, 4 and 1 respectively of the disdate string.

Because this is a bit tedious to type, with a distinct possibility of error, I usually turn it into a macro:

```
STORE 'STORE $(disdate,7,2)+$(disdate,
4,2)+$(disdate,1,2) TO mdate' TO
makedate
```

Listing 1. Sample routine to give the user freedom to type the date in any desired format.

```
* DATE.CMD date stripper 4/84 by LB
* Input variable mdate (C) containing dd/mm/yy or d/m/yy or
* whatever
* Output variables year, month, day (N)

store @('/',mdate) to slash1
store @('/',$(mdate,slash1+1)) to slash2
if slash2 = 0
  store val$(mdate,slash1+1) to year
  store val$(mdate,1,slash1-1) to month
  store 0 to day
else
  store slash2 + slash1 to slash2
  store val$(mdate,slash2+1) to year
  store val$(mdate,slash1+1,slash2-slash1-1) to month
  store val$(mdate,1,slash1-1) to day
endif
release slash1,slash2
```


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Word Processing

Framework's word processor is dynamite! It gives users the choice of frame or fullscreen viewing of documents, multiple margins within a single file, automatic justification and repagination, header/footers, page numbers and more. The streamlined menu system helps new users get started in a hurry and "shorthand" commands help veterans work even faster.

Outlining

The innovative and very powerful outline processor can be used as a standalone organizer or as a companion to the word processor. Using this outline mode, single ideas can be quickly captured and then expanded into fuller concepts and solutions. Any outline-frame or subheading within an outline can be instantly expanded to include text, spreadsheets, graphs or databases. Finally, with Framework, your PC is truly a thinking machine.

Database

Framework's database system can be learned quickly and put through its paces effortlessly because most commands are common throughout the entire program. Framework itself will handle most of your analytical information management needs, and if very large data handling is required, Framework is fully compatible with dBASE II®.

Spreadsheet

Spreadsheets are simple to create, use traditional row/column or English-language cell addresses, can be linked to automatically update other files based on cell data and have an exclusive international numerics feature that will change entries to accurately reflect changes in currency denominations including the placement of commas and decimal points.

Graphics

The graphics portion of Framework has been designed to produce exceptional charts and graphs on standard monochrome monitors. Six of the most frequently used business graphs are built-in and can be automatically drawn and updated from data in spreadsheets and database files.

DOS Access

The new DOS access capability allows any user to actually run other PC DOS software inside Framework. This allows users to gather data from other programs without quitting Framework. It will be of great help to people who frequently shuttle between programs and to businesses who perform frequent interchange of programs or data with larger systems.

Custom Applications

Framework comes complete with its own programming language. Users can begin writing their own custom packages or use software developers right away. In addition, dealers will continue to receive the excellent support that

has helped make Ashton-Tate the front-runner in the software industry with dBASE II and FRIDAY!

Hardware

Framework will run on the IBM PC, PC XT and all compatibles. It requires just 256K RAM and dual 360Kb floppy disk drives with monochrome display.

Availability

Framework will be available in Australia from the end of July. Contact your dealer end-June for more details or write to the Master Distributor, ARCOM Pacific, Freepost 2 (no stamp required), P.O. Box 13, Clayfield, Qld. 4011.

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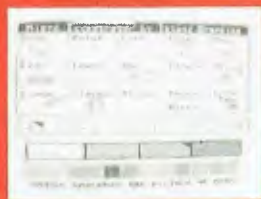
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and then call it as required in programs:

```
&makedate
```

Of course, this approach means the variable 'makedate' must be carefully preserved through all the releases and restores in the suite of programs, but that's not terribly difficult.

As You Like It

A more difficult problem is allowing the user more freedom to type the date in exactly as he or she wants to. We must work out from the positions of the slashes in the dates which characters represent the years, months and days. Listing 1 is a sample routine to do this. Its input is a character string, mdate, and its output is three numeric variables: day, month and year. This can then be used to calculate a Julian Calendar number.

Its operation is a little obtuse in parts, particularly where we add the position of the first slash to the position of the second slash. The reason for this is, at that point in the program, slash2 contains the position of the second slash in the substring starting just after the first slash, whereas we want its position in the original string, if you see what I mean. If you don't, try single-stepping through the routine with ECHO set ON and TALK set ON, and all should (eventually) become clear.

Name Game

A similar problem is handling names. Generally, we want to index a database containing names and addresses on the surname field, but that generally means we have to design screens with separate surname and forename fields, and the user has to be aware of why this is so. Why can't the machine do the dirty work?

In other words, why can't the user type in a name in the form 'Mr. John Q. Public' and let the computer work out what the various fields are?

The routine in Listing 2 is as close as I've been able to get to doing

this. It still imposes some format restrictions on the user: for example, middle initials must always be followed by periods (as that is how the program recognises them), and the title at the beginning must be followed by either a space or a period.

The technique used here is to examine the first part of the string; and, as we recognise what it is, to

store it into the database using a REPLACE command; and then 'lop it off' the front-end of the input string, name.

Notice the list of titles and honorifics can easily be extended to take account of military ranks or whatever; Listing 2 is just used as an example.

Incorporating this kind of code into a V2.3-style append or edit is very

Listing 2. Name handling routine.

```
* SUBNAME.CMD
* V 3.0 by LB 5/13/84
* Pulls apart name in form 'Mr. John Q.A. Public' into separate fields
* Input memory variable: name
* Output fields: title,first,midinit,surname
* Working variables: sndp - dot position, snsp - space position

* Establish if there is a title & take care of it.
STORE @(' ',mname) TO snsp
STORE @('.',mname) TO sndp
IF (sndp < snsp .AND. sndp # 0)
  STORE sndp + 1 TO snsp
ENDIF
STORE $(mname,1,snsp-1) TO snti
IF @(!snti,'MRMRSMISSMSPROFREVDRMR.MRS.MISS.MS.PROF.REV.DR.') > 0
  * It is a title
  REPLACE title WITH snti NOUPDATE
  * Remove title from name
  STORE $(mname,snsp) TO mname
ENDIF

* Remove leading spaces
DO WHILE $(mname,1,1) = ' '
  STORE $(mname,2) TO mname
ENDDO

STORE TRIM(mname) TO mname
IF @(' ',$(mname,1)) > 0
  * there are 2 words
  * Check for first name
  STORE @(' ',mname) TO snsp
  STORE @('.',mname) TO sndp
  * Is first name an initial?
  IF (sndp < snsp .AND. sndp # 0)
    * It is
    REPLACE first WITH $(mname,1,sndp) NOUPDATE
    STORE $(mname,sndp+1) TO mname
  ELSE
    * First word is first name
    REPLACE first WITH $(mname,1,snsp-1) NOUPDATE
    STORE $(mname,snsp+1) TO mname
  ENDIF

* Remove leading spaces
DO WHILE $(mname,1,1) = ' '
  STORE $(mname,2) TO mname
ENDDO

* Check for midinit
REPLACE midinit WITH ' ' NOUPDATE
STORE @('.',mname) TO sndp
DO WHILE sndp > 0
  REPLACE midinit WITH TRIM(midinit) - $(mname,1,sndp) NOUPDATE
  STORE $(mname,sndp+1) TO mname
DO WHILE $(mname,1,1) = ' '
  STORE $(mname,2) TO mname
ENDDO
STORE @('.',mname) TO sndp
ENDDO
ENDIF

* What's left must be the surname
REPLACE surname WITH mname
RELEASE snsp,sndp,snti
```


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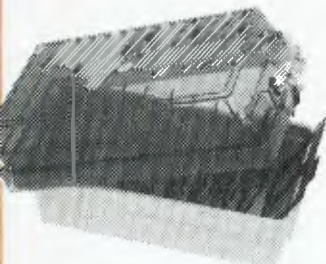
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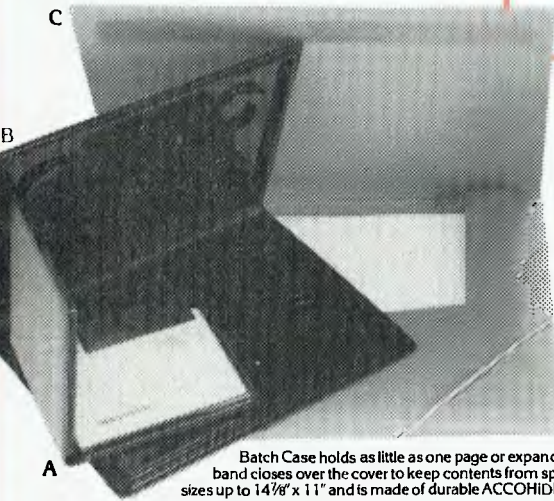
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simple. The pseudo code remains identical, but a DO SUBNAME command (or whatever processing you require) is inserted in-line just before the memory variables are replaced into the database.

For example, take a look at Listing 3, a simple screen input routine which inputs employee timesheets for a professional time accounting system.

The only bits of processing are, first, a date conversion (&makedate), and then two lines of time conversion:

```
STORE VAL$(tifr:time,1,2))+VAL$(tifr:
time,4,2))/60 TO tifrom
STORE VAL$(tito:time,1,2))+VAL$(tito:
time,4,2))/60 TO tito
```

It's worthwhile taking some time to understand these, as they illustrate how you can take a character string of the form 'hh.mm' and convert it into a numeric figure for hours and a decimal fraction of an hour.

Valid Reasons

Two other techniques are important here. First, the program illustrates validation against another database. It's important, in any billing system, that work is only done for valid job numbers and client numbers – otherwise it can't be billed. This kind of control is vital to the profitable operation of any business, as it eliminates unprofitable work.

In the secondary database area, we have opened the jobs database, which is indexed on the concatenation of client number and job number. Once the form has been filled in, we set up a key value from those two fields, select secondary and try to FIND the appropriate record. If we can't find it, dBase will return a record number of 0, and so we will keep returning to edit those fields until a valid combination of job number and client number has been keyed in.

The second important technique is the use of a prefix (ti-, meaning Time Input) before all memory variable names to indicate that they belong to this module. At the end, the RELEASE ALL LIKE ti* statement releases only those variables known in this module

of code; any others are left alone. Of course, some care must be taken with names when using this technique. For example, if in a module called Main Add we decide to prefix variable names with ma-, then RELEASE ALL LIKE ma* will also release our makedate macro variable. Perhaps the best solution is to prefix all global variables like that one with a g.

Between them, these techniques illustrate how string handling techniques can be used to alter the internal storage of dates, times and names. Other types of character variables can also be handled this way; it's up to you to make use of it.

Next month, a look at dBase programming style generally, with the emphasis on structured programming techniques.

Listing 3. Screen input routine for employee timesheets.

```
* TIMEIN.CMD
* enter times from timesheets
USE times INDEX timid

* set up validation for job number and client number
SELECT SECONDARY
USE jobs INDEX jobid
SELECT PRIMARY

STORE ' ' TO tistaffno
STORE t TO timore

DO WHILE timore

  STORE ' ' TO disdate
  STORE ' ' TO tifr:time
  STORE ' ' TO tito:time
  STORE ' ' TO ticlientno
  STORE ' ' TO tijobno
  STORE 000.00 TO tirate
  ERASE
  @ 4,8 SAY 'Staff ID'
  @ 4,16 GET tistaffno PICTURE '!!!'
  @ 4,40 SAY 'Date'
  @ 4,44 GET disdate PICTURE '99/99/99'
  @ 5,4 SAY 'Start Time'
  @ 5,16 GET tifr:time PICTURE '99:99'
  @ 5,25 SAY 'Finish Time'
  @ 5,36 GET tito:time PICTURE '99:99'
  @ 7,4 SAY 'Client No.'
  @ 7,16 GET ticlientno PICT '999'
  @ 7,25 SAY 'Job Number'
  @ 7,36 GET tijobno PICTURE '999999'
  @ 9,4 SAY 'Rate'
  @ 9,16 GET tirate
  READ
  IF tifr:time = ' '
    STORE f TO timore
  ELSE
    * Validate clientno and jobno
    STORE ticlientno+tijobno TO tival
    SELE SECO
    * jobs database is indexed on clientno+jobno
    FIND &tival
    DO WHILE # = 0
      @ 22,2 SAY 'Invalid job number or client number. Please re-enter'+CHR(7)
      @ 7,16 GET ticlientno PICTURE '999'
      @ 7,36 GET tijobno PICTURE '999999'
      READ
      STORE ticlientno+tijobno TO tival
      FIND &tival
    ENDDO
    SELE PRIM
    APPEND BLANK
    &makedate
    STORE VAL$(tifr:time,1,2))+VAL$(tifr:time,4,2))/60 TO tifrom
    STORE VAL$(tito:time,1,2))+VAL$(tito:time,4,2))/60 TO tito
    REPLACE staffno WITH tistaffno, date WITH mdate
    REPLACE from:time WITH tifrom, to:time WITH tito
    REPLACE clientno WITH ticlientno, jobno WITH tijobno, rate WITH tirate
  ENDIF
ENDDO
RELEASE ALL LIKE ti*
```

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THE TURBO Pascal package comes in two parts: the program diskette and the associated documentation. I will discuss each in turn.

The disk supplied with Turbo Pascal contains a number of different programs. The compiler is supplied as a 23K object file which includes what amounts to a complete Pascal development environment. Included in this file are a sophisticated text editor, which closely mimics WordStar in its keyboard usage, a compiler and linker, and the system run-time package.

The environment created for the user as programs are developed is

very similar to the UCSD system: there is almost complete integration between the compiler and the system editor. The system differs, however, from the UCSD system, in that once development is complete the resulting program can be saved as a stand-alone object file which may be executed direct from the operating system. Thus, one can generate native machine code for the processor being used and avoid the considerable inefficiency of p-code (as is usually seen in the UCSD implementation).

Also included on the disk are a series of Pascal source files which generate quite an interesting spread-

sheet calculator, a listing utility, the installation programs and a number of miscellaneous files.

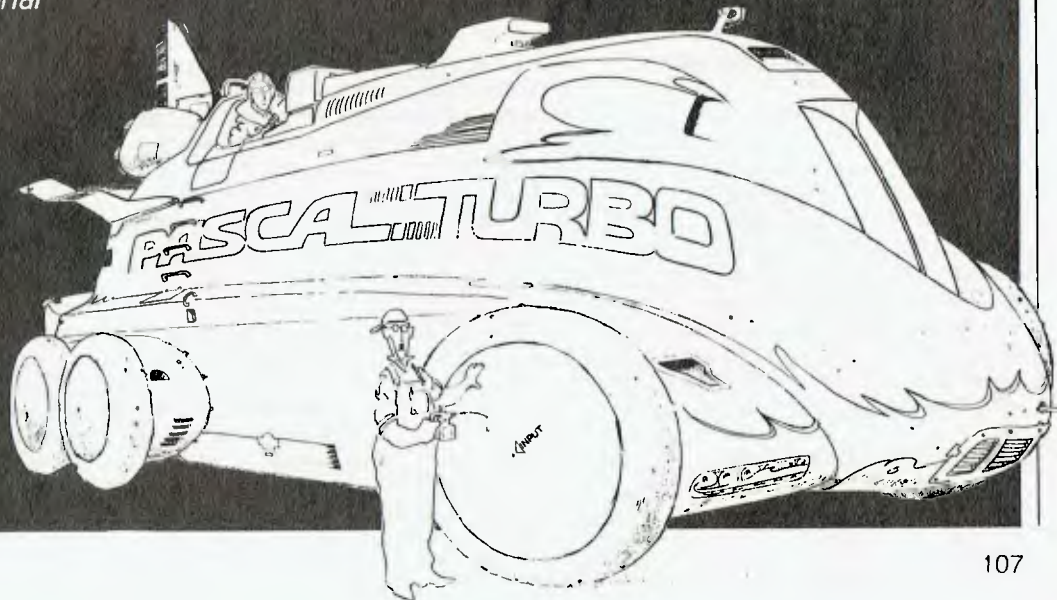
The documentation supplied with the package runs to over 250 pages and is very well set out and presented. Yes, Virginia, there is even a very complete index. There are a number of typographical errors in my copy of the manual, although I am sure this will be corrected in later printings.

Use of Turbo Pascal

To use the compiler, after backing up the distribution disk to a work disk, you first have to adjust the package to the screen characteristics and

Turbo Pascal

Pascal is a widely used and powerful high-level language with a large and devoted following. In the microcomputer area there have, to date, been two very popular compilers. The first is the UCSD Pascal system, which is used on a large range of microcomputer systems including the ubiquitous Apple II. Pascal MT/+ by Digital Research is the other, and is the current standard Pascal compiler for the CP/M and CP/M-86 environment; this compiler had a good reputation and has many advocates. Into the CP/M and CP/M-86 world now steps Turbo Pascal from Borland International of California. David More reviewed it and discovered a winner.



Turbo Pascal

SOFTWARE REPORT CARD

Program: Turbo Pascal
 Made by: Borland Industries
 Hardware required: CP/M and CP/M-86 systems, MS-DOS, PC-DOS systems
 Best points: Speed of compilation; integrated nature of system
 Worst points: Lack of proper overlay handling

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

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keyboard layout of your computer. This process is very simple and clearly explained in manual. The install program used is unusual in my experience in that it allows not only for screen handling to be configured, but also for the editor to be configured to take advantage of whatever arrow or function keys are available on your keyboard.

Once installed, the system is run by typing TURBO and hitting 'return'. The user is then asked one question and a main system menu is displayed. The main menu offers the following choices:

- W - Load the Work File
- M - Load the Main File
- E - Edit the Work File
- C - Compile the source code held in the editor
- X - Execute a .com file
- D - Obtain a disk directory
- S - Save the source file
- O - Go to the compiler option menu
- Q - Quit the system

The function of most of these selections is obvious and need not be discussed further, except to say that all the options function with quite remarkable speed. The real sleeper of the system is the 'O' option, which allows the compiler output options to be selected. This menu offers three different compile locations:

- M - Compile to memory
- C - Compile to a disk file (.com extension)

H - Create a file without run-time library, for chaining to other program modules.

Additionally, this menu allows the user to locate run-time errors in the source file simply by specifying at what program counter location the error occurred. The error location is reported by the run-time package each time an error occurs, along with the error code. This feature, combined with the fact that the editor is automatically entered with the cursor at the offending location, makes debugging often obscure run-time errors incredibly easy. It goes without saying that during compilation this feature also operates, so syntax errors are easily identified and corrected.

These features alone would be a fantastic improvement over most compiler systems. However, due to the speed with which compilation occurs, in even quite large programs syntax errors can be located in a matter of seconds. Since the source file remains resident as the compiler runs, changes to the source can be made very rapidly. It requires one keystroke to re-enter the editor, and immediately the cursor is positioned on the offending section of code and changes can be made instantly. Often after only 15 seconds the compiler can be running again on the altered code. This sort of turnaround makes development very efficient and gives even the fastest interpreted languages a real run for their money.

By now you must be thinking all this is too good to be true, and that

this system can only be offering a very limited subset of Pascal. This could not be further from the truth. All the restrictions the compiler operates under are very minor and easily overcome using other slightly non-standard procedures incorporated in the system.

Significant extensions are also offered, including absolute address variables, bit/byte manipulation, direct memory and port access, dynamic strings, in-line machine code, program chaining, type conversion functions and structured constants. Make no mistake, this is an almost complete implementation of ISO Pascal, with full floating point BCD arithmetic (11 significant digits with a range of +/- 10E38). So much for the difficulty which is often apparent in getting floating point arithmetic working well in some other popular structured programming languages!

Compiler Performance

Using the standard 'Sieve of Eratosthenes' benchmark, Turbo Pascal's performance was as follows on a 4MHz Z80 system (hard-disk-based). The code used for the test was derived from the article by J and G Gilbreath in the January 1983 *Byte* (page 283). For comparison, the figures for Pascal MT/+ Version 5.5 are included.

	Turbo Pascal	Pascal MT/+
Compilation	< 1 second	50 seconds
Linking	0.00 seconds	35 seconds
Execution Time	24 seconds	24 seconds
Size of generated code	6K bytes	12K bytes

It can be seen that in approximately one-hundredth of the waiting time you get a faster code, and it's more compact!

When compiling a 560-line program which does bi-exponential non-linear curve fitting, the comparison was equally dramatic. The time spent in compilation dropped from minutes to seconds, and the resultant code size was decreased from 35 to 18 Kbytes. Incidentally, the code used in this instance had been written for MT/+ and was compiled with only one change using Turbo Pascal.

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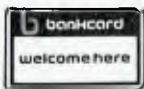
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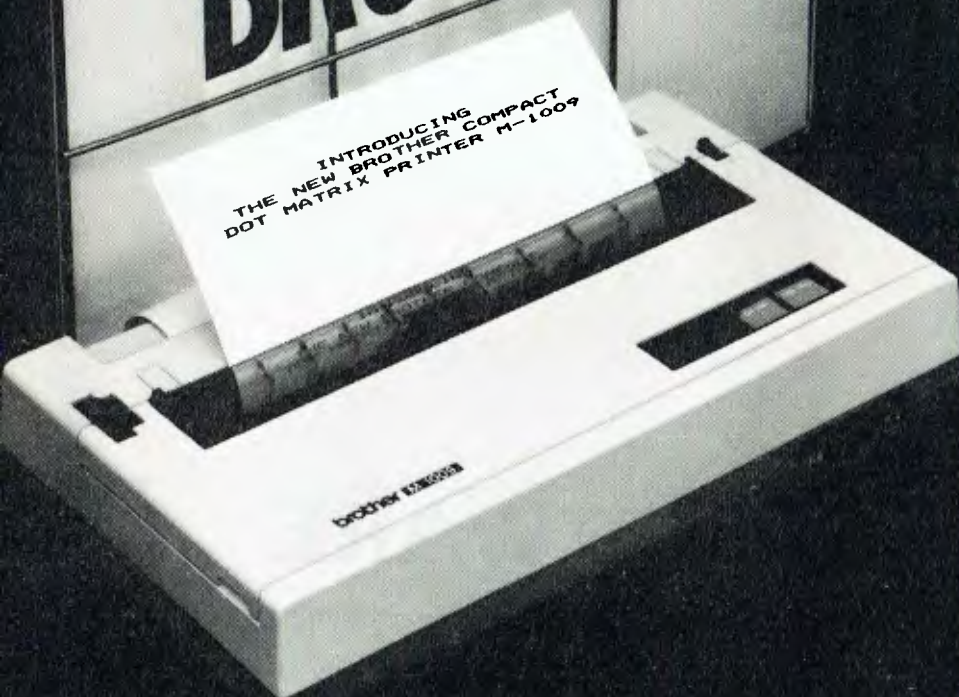
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Problems and Bugs

So readers of this review will not be convinced that I have been completely blinded by the merits of this package, and thus taken leave of my critical faculties, I offer the following comments about deficiencies I have found.

First, the system as it is currently supplied offers no facility for compiling individual program segments for later linking. Such a facility can be very useful in the development of large applications, but its lack is only a minor restriction for the beginner or even moderately advanced user. Incidentally, in the documentation Borland suggests that if this feature is crucial the company does have a compiler which supports such facilities.

Second, the CP/M-80 version of the system will now keep track of the fact that it is running from other than user area 0. This means each time you leave the system from somewhere else, you have to re-enter the appropriate area to begin again. This problem is really only of moment to

those who have hard disks and use the user areas to partition applications.

Third, the system does not support overlay structures except via chain and execute commands. The use of this schema is more clumsy than a proper overlay handler, but again the full Borland compiler does have this facility if needed.

Lastly, it is worth noting that the editor is only able to cope with text files which are as large as available memory (approx 25K). This limitation is not as serious as it seems because, with the use of 'include files' in the main program source, one can compile programs up to about 2000 lines without effort. Of course, the source files have to be kept as smaller modules on disk, but with good program design this is only a very minor point.

Conclusions

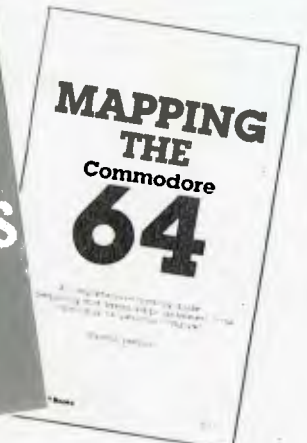
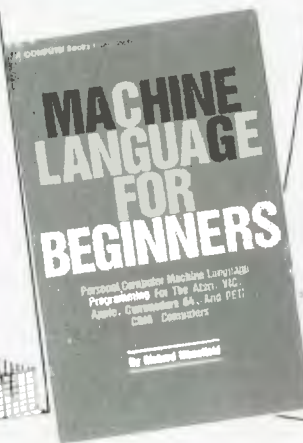
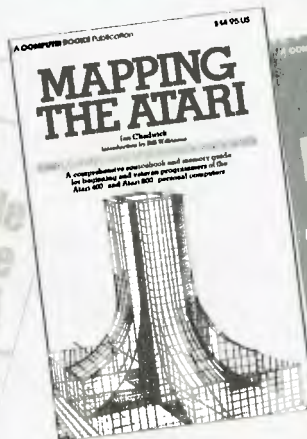
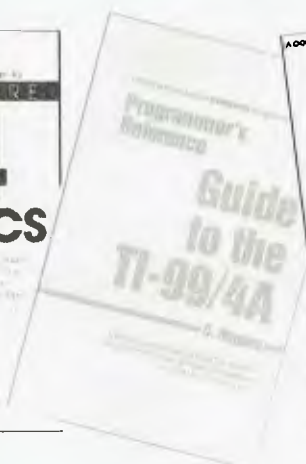
The Turbo Pascal system is available to run under CP/M-80, CP/M-86, MS-DOS and PC-DOS. This means that

with only very minor changes the source code can be compiled and made to run on a very large array of machines. In addition, the product is distributed by a local agent, Software City, which has a deep interest in the support of its product lines and a preparedness to help all levels of users get the most out of the products it supplies.

In conclusion, this is the best compiled language system I have ever seen or used on microcomputers. However, I have saved the best news to last, which concerns the price. The total price of Turbo Pascal in this country, with local support, is only \$79.95. This is at least five times less than the nearest competitor and is, frankly, a bargain in the best sense of the word. The product is not cheap, it is just fantastic value for money. If you have ever wanted to learn about structured programming and Pascal, now it is within your grasp. Get Turbo Pascal and enjoy!

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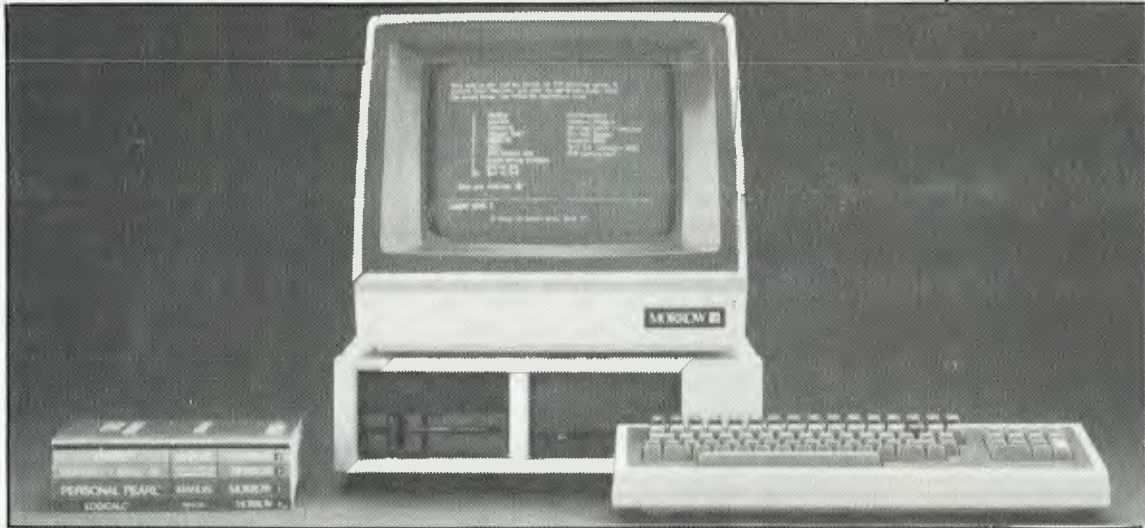
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Programmer's Workbench

FIRST OF ALL, I've just come back from the Land of the Long White Cloud, where I spent a couple of weeks giving seminars on dBase II and CP/M. I was quite surprised at the level of activity there; especially on the dBase course, where I found that many of the attendees were at a more advanced stage than in Australia. In Auckland, most of the people who attended were still using dBase Version 2.3, but were very keen to get the most out of it; while in Wellington, I found that most users were up to 2.4, and some had received updates that were not yet available in Australia. ▶

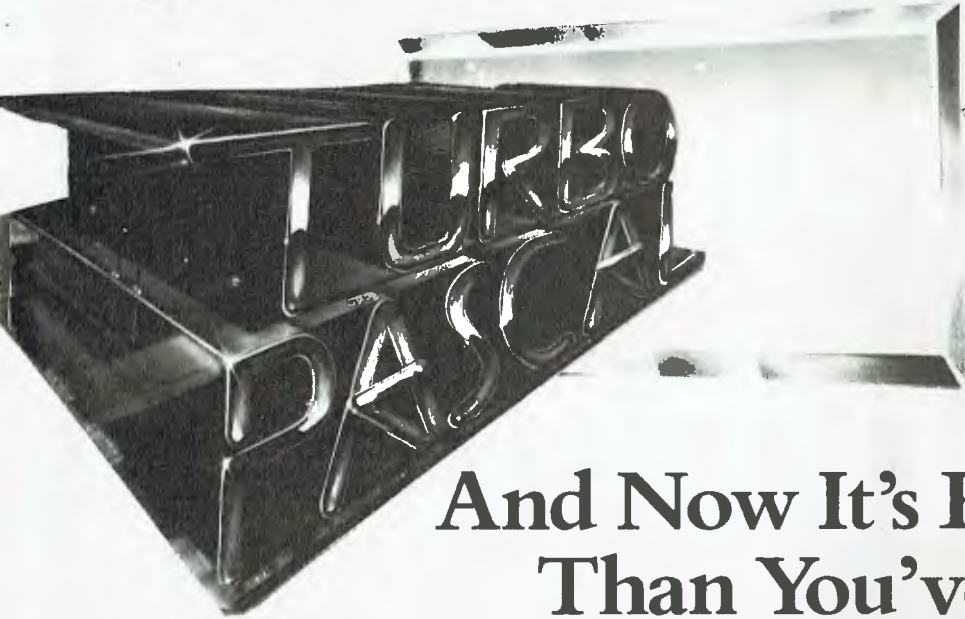
- A regular column from Les Bell covering all the odds and ends that won't fit anywhere else

The trouble with the kind of work I do is that I get to see an awful lot of things I just never get time to write an article about, and a lot of useful information gets lost that way. You see, in addition to writing for 'Your Computer', I also do consulting work, run a software house, speak at seminars and somewhere in between that lot I also have to sleep occasionally!

So, beginning with this issue, I'm going to start a column – hopefully regular – in which I can write about some of these things which may not (or may) merit full articles, but which simply can't be covered. For obvious reasons, I sometimes can't give names – software we write for our clients is theirs and what we're working on is their business – but generally I can pass on some useful information in this combined diary and notebook.

I'm calling this column 'The Programmer's Workbench', as it will deal with some of the problems and opportunities I see as a programmer and consultant, rather than as a journalist. Don't confuse this with the well-known Bell Labs 'Programmers Workbench', which is a collection of UNIX tools for programmers. Expect some software listings, mini-reviews of products, news and comment, and anything else that comes to hand and won't fit elsewhere.

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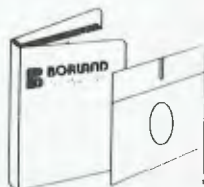
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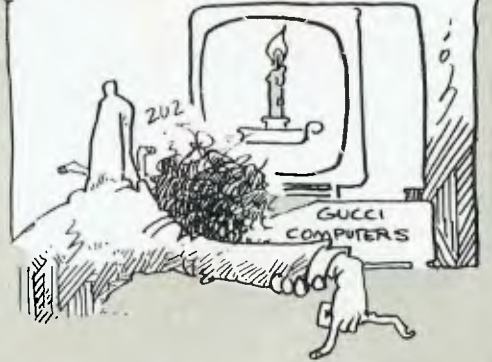
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...FROM THE PROGRAMMER'S WORKBENCH, LES BELL COVERS THE ODDS, & ENDS FIT...?

THE TROUBLE WITH MY WORK IS I SEE AN AWFUL LOT OF THINGS THAT I DON'T GET TIME TO WRITE ABOUT... & A LOT OF USEFUL INFORMATION GETS LOST THAT WAY... YOU SEE, IN ADDITION TO OVERSEEING "YOUR COMPUTER", I TAKE OVER SMALL COUNTRIES, CONSULT, RUN A "SOFTWARE" HOUSE, SPEAK AT SEMINARS... & SOMEWHERE IN BETWEEN THAT LOT, I HAVE TO SLEEP OCCASIONALLY...



...THEREFORE, I HAD A GOOD ZUZ WHILE I WROTE THIS ARTICLE...



FIRSTLY, I WAS SURPRISED AT THE LEVEL OF ACTIVITY IN "THE LAND OF THE LONG WHITE CLOUD"...

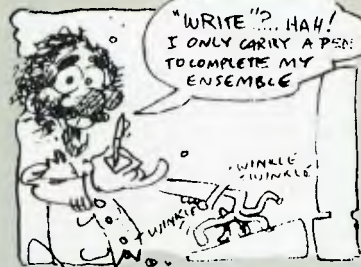


& ...TALKING OF BACKWATERS... I'LL BE DOING MY PROGRAM WRITING IN MELBOURNE FROM NOW ON... GET AWAY FROM SYDNEY'S NIGHTLIFE...



...AS I WRITE, COMPUTER EQUIPMENT IS BECOMING HARDER TO OBTAIN... FOR A COUPLE OF REASONS...

1ST IS A WORLDWIDE SEMI-CONDUCTOR SHORTAGE...

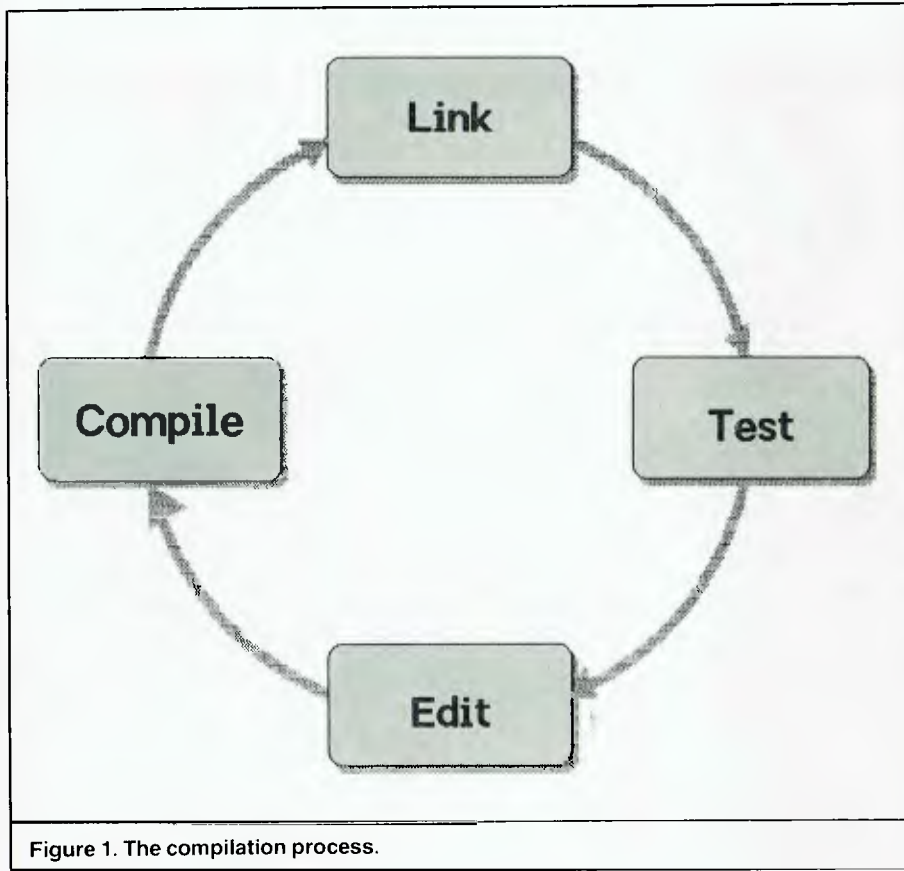


Attendances were good, and I expect to be returning to NZ before long, for yet another dBase seminar series as well as a seminar on Microcomputers in Professional Computing, in conjunction with the redoubtable Bill Bolton. In the meantime, I'm giving more thought to my theory that the bigger the city, the

less quality software gets written there. I'm serious - the major obstacle to my writing more software is Sydney's nightlife and the wide range of things to do here. And obviously, this explains why a lot of good software comes out of Melbourne - there's nothing else to do! (Careful, Les - we've got readers and advertisers in

both cities who might argue with you there! - Ed.) In this light, the fantastic interest in dBase in New Zealand becomes more plausible.

Hard to get Machines
As I write, computer equipment is becoming harder and harder to obtain, for a couple of reasons. The



Aztec C is not one of the top-level C compilers; its major claim to fame is that it is one of a very few full C compilers around for eight-bit machines, including the Apple II. By restricting exports of products at this level, the US is not hurting the Soviet bloc so much as US trading partners.

Compiler Manager

Professionally developed software products are generally written in C, COBOL, FORTRAN (by Real Programmers only), PL/I or some other kind of compiled language. There are a couple of reasons for this: firstly, no source code is distributed, reducing the risk of the nastiest kind of piracy (commercial rip-offs with only the copyright notice changed); secondly, compiled programs are generally smaller than equivalent interpreted programs, especially when the interpreter itself is figured into the equation; and finally, compiled code is faster. Generally, compiled languages like PL/I allow you to write considerably more readable and maintainable code than, say, BASIC.

One major pain in the **** about compiled languages, however, is the length of time required to implement and test small changes in the code. The reason for this is the compilation process itself (see Figure 1). The source code for each module in the program must be compiled, then they must all be linked together with each other and the run-time library plus any other stuff such as screen handlers.

first is a world-wide semiconductor shortage, which arises from a number of factors. Basically, the problem is that demand outstrips supply; manufacturers cannot produce enough and are loath to install new equipment to up production because every time they have done so before, the boom has gone bust, leaving them with huge bills and falling sales.

A slightly less obvious reason for delays is the current situation in the US regarding export shipments of high-tech equipment. Here in the office, we've been twiddling our thumbs waiting our turns at the terminal because our new multi-user Compupro 816 system is the subject of a little interest from the US Department of Commerce. They want to know how many register-to-register adds it can perform in one second, amongst other details.

The Commerce Department has been a thorn in the side of several US mainframe and mini manufacturers, most notably Digital Equipment Corp, but now it is taking an interest in

micros. Although we feel it most keenly since we are desperate for our new machine, it is hitting other people as well.

One of the most recent cases was the ban on shipments of the Manx Aztec C compiler to the UK. Now,

```

; COMPILE AND LINK FOO WITH SCREEN HANDLERS AND CUSTOM INSTALL
AREA
PLI B:FOO
PLI B:FOO1
PLI B:FOO2
PLI B:FOO3
PLI B:FOO4
PLI B:FOO5
PLI B:FOO6
PLI B:FOO7
PLI B:FOO8
PLI B:DRAWFORM
PLI B:FILLFORM
RMAC B:SCR1
RMAC B:ZOT $$PZSZ
RMAC B:SLUDGE $$PZSZ
RMAC B:CUSTOM $$PZSZ'
LIB B:SCREENS.IRL=B:DRAWFORM,B:FILLFORM,B:SCR1
XSUB
LINK B:FOO = B:CUSTOM,B:FOO,B:SCREENS.IRL[S,A,GFOO],(FOO1)(FOO2)&
(FOO3,ZOT)(FOO4)(FOO5)(FOO6,SLUDGE)((FOO7)(FOO8)

```

Listing 1. SUBMIT/BATCH files to aid in debugging.

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ECO-C COMPILER

The Ecosoft C compiler is perfect for the beginner and the experienced professional. Eco-C is a full C compiler and supports all data types (including longs, floats and doubles) and operators (except bit fields). Everything you need is in the package.

The experienced programmer will appreciate that the C library has over 100 library functions, including transcendentals. To the beginner, this means you can quickly start writing C programs. They conform to UNIX v7 specifications, so programs written with the Eco-C compiler can be run under the UNIX C Compiler with few (if any) changes. You won't have to rewrite when a new piece of hardware comes on the market.

We haven't forgotten the professional, either. The Eco-C compiler generates Z80 assembler output (Zilog mnemonics) for use with Microsoft's MACRO 80 assembler (M80) to produce REL files for the linker (L80). The compiler uses a true LL (1) grammar with predictive (not brute force) parsing. Variables can be made fully recursive to the limit of the symbol table space. Files larger than free memory can be compiled and there are no alignment restrictions on preprocessor directives. Assembly language interfacing is a snap. Best of all, there are no royalty requirements for using the compiler or the library. The result is a professional package that generates extremely efficient code.



Eco-C Library Function

Input/Output

close ()	creat ()	fclose ()
feof ()	ferror ()	fflush ()
fgets ()	fileno ()	__fillbuff ()
__flushbuf ()	fopen ()	fprint ()
fputs ()	fseek ()	fscanf ()
ftell ()	__getc ()	getc ()
getchar ()	getd ()	getl ()
gets ()	getw ()	lseek ()
__putc ()	putc ()	putchar ()
putd ()	putl ()	puts ()
putw ()	read ()	rewind ()
__scanf ()	scanf ()	sprintf ()
sscanf ()	ungetc ()	unlink ()
write ()		

String Manipulation

atof ()	atoi ()	__atol ()
atol ()	decimal ()	__ftoa ()
ftoa ()	__hex ()	hex ()
index ()	itoa ()	lmod ()
ltoa ()	__octal ()	octal ()
strcat ()	strcmp ()	strcpy ()
strlen ()	strncat ()	strncpy ()

Utility Functions

alloc ()	bsort ()	calloc ()
chain ()	dint ()	drand ()
drandl ()	__exit ()	exit ()
fabs ()	free ()	irand ()
isalnum ()	isalpha ()	isascii ()
isdigit ()	islower ()	isprint ()
ispunct ()	isspace ()	isupper ()
longjmp ()	rand ()	qsort ()
rsvstk ()	sbrk ()	setjmp ()
setmem ()	soundex ()	

Operating System Functions

__bdos ()	__bios ()	__exit ()
exit ()	inp ()	outp ()

Transcendental Functions

acos ()	asin ()	atan ()
atan2 ()	cos ()	cosh ()
cotan ()	exp ()	log ()
ln ()	power ()	sin ()
sinh ()	sqrt ()	tan ()
tanh ()		

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log, natural log, natural antilog, exponential, linear transformation, adding any number of variables to create a new variable, plus others.

*The DMS places you in complete control of the data files and allows you to create new variables from existing variables via the transformations.

Other features include:

- * Descriptive statistics
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- * Correlation analysis
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- * Time Series analysis
- * Nonparametric Tests
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Runs under MS-DOS/PC-DOS, CP/M86, and CP/M. Requires 128K memory (64K for CP/M).

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```

PLI B:FOO3
LINK B:FOO = B:CUSTOM,B:FOO,B:SCREENS.IRL[S,A,GFOO],(FOO1)(FOO2)&
(FOO3,ZOT)(FOO4)(FOO5)(FOO6,SLUDGE)((FOO7)(FOO8))

```

Listing 2. The kind of command that has to be retyped manually if you want to make just one small change.

```

; COMPILE AND LINK FOO WITH SCREEN HANDLERS AND CUSTOM INSTALL
AREA
PLI B:FOO
PLI B:FOO1 ;FOOEXT.DCL
PLI B:FOO2 ;FOOEXT.DCL
PLI B:FOO3 ;FOOEXT.DCL
PLI B:FOO4 ;FOOEXT.DCL
PLI B:FOO5 ;FOOEXT.DCL
PLI B:FOO6 ;FOOEXT.DCL
PLI B:FOO7 ;FOOEXT.DCL
PLI B:FOO8
PLI B:DRAWFORM
PLI B:FILLFORM
RMAC B:SCR1
RMAC B:ZOT $$PZSZ
RMAC B:SLUDGE $$PZSZ
RMAC B:CUSTOM $$PZSZ
LIB B:SCREENS.IRL=B:DRAWFORM,B:FILLFORM,B:SCR1
XSUB ;LINK
LINK B:FOO = B:CUSTOM,B:FOO,B:SCREENS.IRL[S,A,GFOO],(FOO1)(FOO2)&
(FOO3,ZOT)(FOO4)(FOO5)(FOO6,SLUDGE)((FOO7)(FOO8))

```

Listing 3. The full version of the SUBMIT file referred to in the text.

On one such program we've developed; it takes up to 45 minutes to re-compile and link the entire system, which obviously makes debugging a drawn-out process. To ease the task, one usually makes up SUBMIT or BATCH files containing all the appropriate commands. A typical such file might look like Listing 1.

The trouble starts when you want to make just one tiny change in FOO3. You have two choices: a) run the entire submit file, have two cups of coffee and do the Herald crossword, or b) try to type only the required commands manually, as shown in Listing 2.

Bear in mind, however, that your chances of typing the LINK command lines correctly are virtually infinitesimally small, and that Bell's Seventh Law of Computing says that the linker will only discover the error after it has been running for twenty minutes, thus wasting the maximum amount of time and generally taking longer than option a) with no coffee and no crossword puzzle to boot.

One night, as I lay awake suffering from caffeine jitters after a hard day of compiling, the answer came to me in the form of a kind of SUBMIT command that comments out compiles, LIBs, LINKs and other steps that are

not required for a successful recompilation. I call it Compiler Manager, and it's so simple I'm surprised nobody else has thought of it, or if they have I've never seen it – although the UNIX concept of 'makefiles' is similar.

Basically the program asks you what files you have changed, and then comments out any lines that do not involve those files. If a line involving a changed file is encountered, the second word on the line is examined, since if it is not the changed file it is a file which is LIBbed or LINKed with it and must now be regarded as a changed file itself. Thus if SCR1 (in the example above) is changed, SCREENS.IRL will itself be changed as a consequence, and the LINK must be performed, even though SCR1 does not appear in the LINK command line.

Any lines involving wildcards (* and ?) are never commented out, since it is impossible to say what previous operations they depend on. A couple of other tips: if you use any included files – for example, for externally declared variables or data structures, or for COMMON blocks, using the %include or #include pre-processor commands – you should put the file names as comments on any lines which they are involved in. Then

changes to them can be handled in the same way as for files which normally appear in the SUBMIT file.

If you need to invoke XSUB to handle multi-line commands to your linker, this causes a minor problem, as the program needs to un-comment the XSUB command before it sees the LINK line and decides whether it is necessary or not. This can be handled by putting the comment ;LINK after the XSUB command and then giving LINK as one of the files which has been altered; a LINK is normally required every time anyway. It is a kludge, I know, but it works, and although I could have come up with a more elegant solution involving a doubly linked list, nobody was paying me for it so it never got done.

Using these tricks, the full version of the SUBMIT file for the example above would look like Listing 3.

The same file will also work with SUBMIT and with SUPERSUB, should anyone want to do a complete re-compilation.

This version of Compiler Manager works under CP/M 2.2 and should work under CP/M-86, but it won't work with MP/M, Concurrent CP/M or MS-DOS. An MS-DOS version should be simpler, if anything, and I am working on a Concurrent CP/M version. It has been regularly used with PL/I and has saved lots of hours of wasted compiles, and has also been tried with BDS C and works with it too. I see no reason why it shouldn't work with BASCOM, CB-80, or any other compiler/linker and associated tools.

Incidentally, if you dig into the code, you will discover the interesting design of CP/M 2.2's \$\$\$SUB files. These files consist of a 128-byte sector for each line of code; each sector consists of a length byte, followed by the command line itself, and then padding of ASCII zeros. What makes writing such files fun is that the sectors are in reverse order!

Each time a program warm boots back to the Console Command Processor, that program logs in the system disk, and as it does so, searches the disk directory for a \$\$\$SUB file. If it finds one, it reads the last sector off the file and executes it, thereby 'eating the tail' of the SUBMIT file. The file gradually shrinks until there is but one sector

left, and then it too goes and the file disappears. This is how the dBase II 'QUIT TO' command works and is the source of the \$\$\$SUB files you will occasionally find on disks as a result of aborted SUBMIT streams – though SUBMIT usually cleans up after itself.

The program is, unfortunately, written in PL/I, which most people can't compile, but if you want the compiled version (REMAKE.COM) for CP/M 2.2, I can supply it on 20 cm CP/M single-sided single-density format, Kaypro or Osborne 13 cm formats and that's all. Send a blank formatted disk, with cardboard stiffener and stamped self-addressed envelope to the address at the end of the article. It should also be available for down-loading from the MiCC Bulletin Board (as are most programs which appear in the magazine, I might add).

Personal Profile Analysis

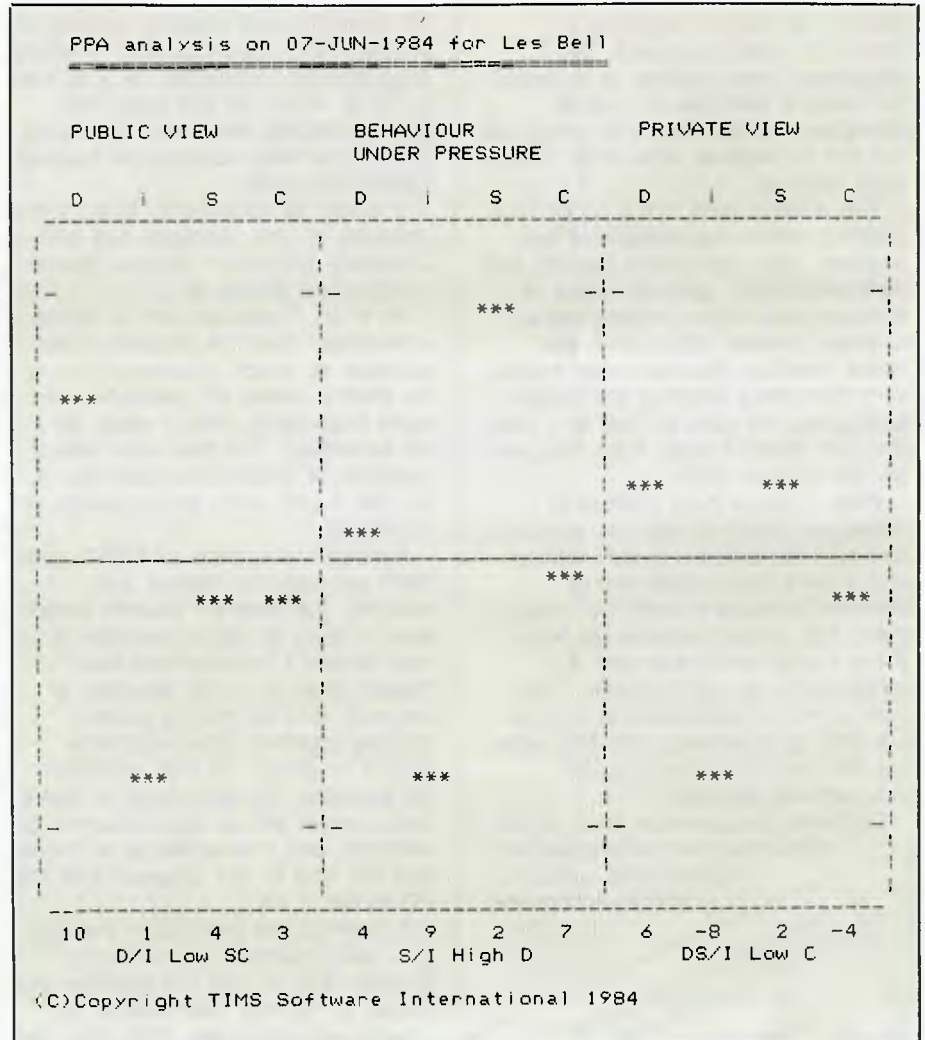
For some years now, one of the primary tools of personnel consultants dealing with the hiring of key people has been a personality profile questionnaire, analysis of which tells the consultant whether a candidate is suitable – from the point of view of personality, at least – for a position.

Such tests are not new; they've been around for quite a few years, and people in the computer industry are used to similar aptitude and intelligence tests. However, I spent a fascinating morning with two Australians who have added a new twist to psychological testing by computerising the process.

Bob Jolly, a personnel consultant, and computer consultant Geoff Whittle, aided by psychologist Abigail Cooper, have succeeded in doing what American specialists said could not be done: they have produced a computerised version of the Personal Profile Analysis.

Before discussing the details of the program, however, they made me sit down at an IBM-PC and run the program – a cunning move, because after seeing my personality profile, they were undoubtedly better able to handle our meeting!

The program itself is incredibly simple to use; the initial instructions to the user are comprehensive and clear, and then it starts the actual



The graphic display part of Les Bell's 'Personal Profile Analysis'.

test. Test is perhaps the wrong word; it has connotations of passes or failure, right and wrong answers, whereas for this questionnaire there are no right or wrong answers.

There are twenty-four 'questions'; in each case the computer displays four words and the user is asked to mark which most strongly applies to him or her and which is least applicable. This is done by using the arrow keys to move to the appropriate word and typing M or L.

It sounds easy, and it is, but that's not to say it doesn't involve some thought. The words are cleverly chosen so that often one has some pretty tough – and revealing – decisions to make, choosing between at first sight equally attractive alternatives. Thankfully, the user has the

option of going back – using the up and down arrow keys – and changing his/her mind. Once all the questions have been answered, he/she also has the option of going back and reviewing.

At this point, the system prompts for the respondent's name and asks him or her to call the supervisor, who takes over to specify what kind of report is to be produced. The system then produces the report on the printer.

The first part of the report is a graphical display of four characteristics: dominance, inducement, steadiness and compliance. These are different drive factors which have a considerable effect on our behaviour. Dominance is a drive to meet goals set from within ourselves, while high inducement is a sign of a desire to meet external

goals – to feel the approval of others, to visibly succeed. The steadiness factor relates to a desire for security with low risk, while compliance is the extent to which we set out to discover what other people want from us.

The second part of the report is a detailed written explanation of the analysis, with paragraphs dealing with particular topics: general; areas of concern; application; organisational controls; general conclusion; and stress reaction. Naturally, this makes very interesting reading; the person taking the test gets to look at it first, and can throw it away if he disagrees. So far, no-one has!

What I found most interesting during our meeting was the similarity between the profiles of Jeff Whittle and myself. Both show strong dominance coupled with low inducement, but under pressure we both show strong steadiness and a tendency to 'go by the book'. The most obvious explanation is that we are both programmers and that what we see here may be a typical 'programmer mentality'.

Certainly programmers tend to like well-structured, well-organised problems and solutions, and to accentuate this

I'd spent the last evening working out programming standards and structured programming techniques for use here at LB & A. So I'd just spent the evening writing the book I intend to go by; that may account for the high steadiness score.

It would be fascinating to do further research on this: perhaps one of the University Computer Science departments could follow up.

All in all, I was left with a sense of amazement that the program could squeeze so much information out of so short a series of questions, and more importantly, that it could do it so accurately. The test even has a measure of redundancy built into it, so that it can verify the accuracy of its results!

Although at a price of \$1650, plus \$600 per year for licence and updates, the program sounds expensive, it really is not. It provides a very powerful management tool indeed, both for initial selection of key staff and for getting people working together effectively once they're on board. In staff selection, for example, you only have to make one mistake with a key executive, for example, and you've lost a lot more than the cost of the program and the PC to run it on.

I came to the conclusion that this is a really marvellous, innovative program that is well put together and cracks an entirely new market for personal computers. Bob Jolly and Jeff Whittle are now in the US having a go at that market; they deserve to succeed and I hope they do.

Coming Up

We're loaded to the gills with software that has come in in the last few weeks, all of it for review. Some of it we have installed and started to run up, and we have some first impressions at least.

Bill Bolton from Arcom Pacific sent us down Concurrent CP/M for the IBM-PC which we have installed (that wasn't difficult) and been using with excellent results. There's no doubt that being able to run more than one program at a time is a major boost to productivity. For example, we've been able to run PL/I compilations in the background, in a window in the screen. We can then go on to do something else, but because the compiler messages appear on the screen, we can immediately switch over to that screen when it has finished.

We're also looking at DRI's Dr. Logo, and will be able to report on that once we've written something serious in it. For the moment, we're having great fun using the turtle graphics.

We also expect to be able to report on the Microsoft Mouse, Word and some of the Microsoft languages next month. Microsoft C, which we have really been putting through its paces, looks like an excellent compiler which generates really fast code.

We're also doing software development on the Lisa, and in a future column we'll show you some of its amazing debugging facilities. You can also look forward to some interesting stuff on Ada, small business software, ProLok, networks and lots of other things currently in the pipeline.

By the way, for those who've been puzzling over it, YAM stands for Yet Another Modem, and is a public domain communications program written by Chuck Forsberg of Beaverton, Oregon.

Mentioned

HiSoft Pty Ltd, 8-12 Alma Road, St Kilda 3182. (03) 534 0383.
TIMS Software International, 450 Little Collins Street, Melbourne 3000. (03) 602 2044.
REMAKE.COM and REMAKE.PLI – Les Bell and Associates Pty Ltd, PO Box 297, Neutral Bay Junction 2089. Don't forget the blank formatted disk and the SASE. □

The profiles produced by answering this questionnaire depend upon the strengths and mixtures of the four measured characteristics —

Dominance

We set out below in general terms, some of the main characteristics of behavior which apply to those people with one of those drives more pronounced than the others.

Inducement

Where Dominance is the highest level of drive, these people are generally fairly aggressive and they tend to take charge of things. They present themselves quite forcefully when they are with others. They may display impatience, and at times can be quite impulsive. Their strengths are that they are ambitious and active, and they can apply pressure on people, and they are willing to get up and get going themselves. They love to compete in many kinds of situations. They look for rewards and incentives, and they have things they must watch out for. They may talk too fast; become over-bearing; can be blunt and discouraged easily. However, they may, at times, intimidate others. They are not always good at providing service, and will try to master each situation in which they find themselves.

Steadiness

Compliance

Inducement as their highest factor are generally verbally aggressive — quite effusive and gregarious and to communicate well on a one-to-one basis. They are creative and the image they dress up conversations. They are persuasive and love to persuade people. They are optimistic.

THE FAMOUS FIVE AT IMA



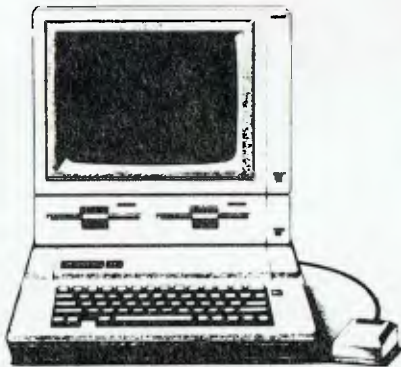
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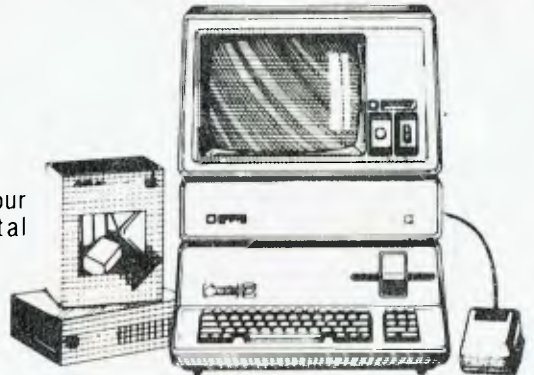
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What do you do when you can't find that important letter you typed two months ago? Especially if you can't remember the name of the file or what disk you put it on. Maria Lengas, a trainee programmer with Les Bell and Associates, looks at a program designed to solve this problem.

Bobcat

THE BOBCAT file directory program was designed to keep track of CP/M files and disks. When using only a few disks it is easy to keep track of and catalogue files, but as your library of floppies begins to grow it becomes a tedious and sometimes nerve-racking task trying to find files.

Bobcat reads the filenames from your disks and creates a database out of the filenames. This is then sorted and can be printed out for quick reference.

How it Works

Once the Bobcat program is running, it prompts for the date, so that it can keep track of which disks need updating. You then number your disks, and feed them into the B: drive to be catalogued.

Each disk you enter to be catalogued is assigned a number ranging from 1 to 999. As each disk is read Bobcat takes note of the filenames and their sizes on the disk, and then stores them, along with a date representation, in a disk catalogue database. It also creates a file called DISK.xxx which contains a description of the disk (like 'Pascal Programs and Utilities'), on the actual disk.

Bobcat can add or delete disk numbers and filenames, print sorted catalogue reports, and perform search and find routines on the disk catalogue database for names of files or disk numbers. It automatically adds a disk filename and a disk number, permits conversion of Bobcat file catalogue databases to ASCII databases, prints out disk contents in various report formats and provides a combined sorted directory and status display.

Bobcat also keeps track of the status of your disks. It automatically notes the amount of space taken on the disk by each file, the number of unused space remaining. This is done files on the disk, and the amount of

by two programs called SDBOB3.COM and SDBOB4.COM, which are modified versions of the public domain SD (Super Directory) utility.

How Well does it Perform?

One disadvantage of Bobcat is its extreme slowness. All in all it took me about four to five hours to organise 70-odd disks into some semblance of order and grouping and to run Bobcat. Another problem I came across was when I tried to go back to the main menu and do something else while in the report menu; this unfortunately was not possible, since there was no quit option to get out of the report section. This was a bit of a bother since I had to reset the system and start again from the beginning.

In addition, if you make a mistake while entering your disks to be read by Bobcat and you happen to be on your last disk, you have to start from the beginning and redo all the disks you had done.

Despite some of its shortcomings, the versatility and usefulness of this package once it has been installed cannot be denied. It has saved us hours that would have been spent rummaging through disks searching

for elusive files. One of its best features is the wide variety of reports available: there are seven different report combinations ranging from alphabetical filename listings to summaries of the disk status of each file in the catalogue.

Documentation and User Friendliness

Bobcat is extremely user friendly, so that even someone unfamiliar with computers and installing new packages can operate it. There is a considerable amount of prompting that makes it virtually error proof, and it has no tendencies to crash (although having to reset to recover from errors is almost as bad). The documentation is also good in that it gives step by step instructions to guide the user through the installation and use of the package.

Bobcat is sold for \$29.95 and comes on a 20 cm single-sided, single density or Osborne 1 distribution diskette with 26 pages of documentation. System requirements are CP/M 1.4 or later, 56K or more memory and two or more disk drives.

Software City, PO Box 62, Blacktown 2148, (02) 621-4242, is the Australian and New Zealand distributor.

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Since we answered a question in January's *Textfile* disclaiming any knowledge of books about MBASIC, we've been inundated with letters telling us about titles on this subject. The most common book mentioned is 'The MBASIC Handbook'; Mike Murray reviewed it for us.

MBASIC Handbook

I RECENTLY bought the best book I've seen for users of MBASIC. It's *The MBASIC Handbook* by Walter A Ettl and Gregory Solberg, and is published by Osborne/McGraw-Hill. I bought it in Perth at Relims Technical Bookshop for the rather exorbitant price of \$30.55.

In the 15 months I've owned a Kaypro II CP/M computer, I've found that learning to use some of the features of MBASIC is tantalisingly tricky. There are plenty of books about the basics of BASIC – some quite good ones include *Illustrating BASIC* by Donald Alcock, *BASIC: A Hands-on Method* by Herbert D Peckam, and *Instant BASIC* by Jerald R Brown.

I also enjoyed the later articles in the 'BASIC for Birdwatchers' series in *Your Computer* by Les Bell (I missed the early ones and never got round to ordering any back issues).

What I simply want to know

But all the references fall down when it comes to explaining, in clear terms (that I can understand), some of the more useful features such as:

- String handling
- Working with random access files
- Searching and sorting
- Defining one's own functions
- Using arrays.

So I've kept my eyes open for the past year, hoping someone would recognise my needs, and perhaps those of others like me, and produce such a book as *The MBASIC Handbook*.

This volume, of some 450 pages, seems to cover everything I've always wanted to know.

Basic Tools

Part One – 'Basic Tools' – explains the elementary commands of BASIC. Chapter 1 provides some background information about running MBASIC

from CP/M, and discusses the keyboard, with emphasis on the keys that play a special role in BASIC. Chapter 2 begins programming, using the commands LET, INPUT and PRINT, along with the arithmetic operators. At this stage a simple 'payroll' program is introduced, which is developed throughout the book as more functions are explained. Chapter 3 brings in housekeeping: saving and loading files, and so on.

Chapter 4 concentrates on decision-making in programming, and brings in IF/THEN and GOTO statements. Chapter 5 I found very useful, as it explains, in copious detail, the Line Editor – I hadn't realised just how powerful it was. (Yes, I know, it's all in the manual; but the Microsoft people must have hired a team of obscurantists to write the manual. In my opinion it's only helpful once you're proficient in BASIC. Hardly helpful to the newcomer!)

Chapter 6 shows how to control output to both the printer and the screen, using the LList, LPrint, Print Using and LPrint Using statements. Chapter 7 brings in single, double or integer-precision, and also introduces the loop-control pairs FOR/NEXT and WHILE/WEND.

Chapter 8 looks at MBASIC's built-in functions, such as TAB, SPC, RND, SGN, and the mathematical functions like SIN, COS and LOG. Chapter 9 examines string functions in a way that I can fully understand, at last!

Advanced Tools

The second part of the book, 'Advanced Tools', deals with commands and functions that (quote) "separate the amateur from the serious programmer". Undeterred, I ploughed on. Chapter 10 deals with arrays and, among other beautiful things, explains the command OPTION BASE. Chapter 11

develops subroutines, and in Chapter 12 considerable effort is spent on searching and sorting programs. Chapter 13 concentrates on debugging.

Chapters 14 and 15 explain sequential and random-access files, and at last I'm clear on those odd functions CVI, CVS, CVD, MKI\$ and so on.

Chapters 16 and 17 are devoted to Boolean operators and user-defined functions, in sufficient detail to be used as powerful programming tools. There's an interesting section on directing the cursor to any part of the screen, which I couldn't get to work – maybe someone out there might be able to work out how to do it.

Power Tools

The third part of the book, 'Power Tools', addresses the professional programmer, but is still helpful to the enthusiastic amateur. Chapter 18 discusses commercially available word processors, and presents a compacting program. Chapter 19 explains how to write a menu driver that ties in a series of programs. Chapter 20 uses the menu driver with the final presentation of the payroll program which has been developed throughout the book. Chapter 21 once again employs the menu driver and presents a useful mailing list program. A program to build keyed files is also demonstrated in this chapter. Finally, Chapter 22 deals with writing user documentation.

All in all, I'm very pleased this book is available. There may well be others which have covered the topic as well, but I certainly haven't seen them.

If you're at all like me, picking up the rudiments of programming from books rather than from experts (the best way, because people learn best from other people), then I thoroughly recommend this marvellous book. □

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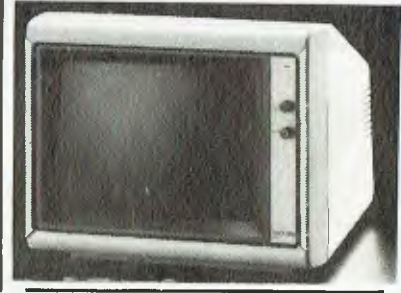
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The long-awaited clean-out in the computer industry has begun, and 'Your Computer' was one of the first to go. We had sunk into a mire of depravity and filth and there was only one way to go. Evan McHugh reports.

'Wiped Out'

THAT'S RIGHT, hackers, *Your Computer*, leading computer magazine, has been cleaned up, wiped out and, dare we sink to the vernacular, we've cashed in our laundry tickets.

We admit that in our last days we were a dirty, unkempt lot, dishevelled and besmirched. We didn't know how badly the rot had set in ... until it was too late. That it had come to this. The staff stood round and could only watch sheepishly as Peter Vincent and Moe Alderman went through us like a dose of salts. We were stung as they tut-tut-tutted and tsk-tsked our putrid printers, turgid terminals and grotty green screens.

Peter and Moe were from Bonella Pty Ltd, demonstrating their CMT Computer Care Products. They had intended just to show us their range, but decided we needed a complete going-over and cleaned us right out.

Moe Alderman was visiting from the US, setting up the distribution for the range of products, which is claimed to be the most complete range of computer care products available from an individual supplier.

"Computers are the third-largest investment most people will make in their life," says Moe, "but how many people really take care of their computer? This affects both its resale value and its usability."

We had to agree. All the screens of the VDTs we use all day, every day had a thin film of gunge on them, the keyboards had dust and grime all over them, and there were pen marks, sticky tape glue and general stains on nearly every surface of our computers. So we were particularly interested when we saw just how much muck could be taken off our gear.

Here are some of the products we saw demonstrated.

Computer Cleaner, which cleans and polishes all the hard exterior surfaces of the computer and peripher-

als. This can be used on screens, keyboards and the like and leaves an anti-static surface.

Light scratch remover can be used to remove scratches from acrylic surfaces such as printer hoods.

Ballpoint pen ink remover is for those people who do everything with a pen in their hand.

Gum-Off is a really useful little item to remove adhesive and labels from all hard surfaces. On the terminal I am using to write this article there are still four bits of paper sticky-taped to the surface of the keyboard and VDT and one sticky label for a terminal identifier.

Also available are **lint-free disposable wipers**. The idea behind these is that there is no point cleaning something if the cleaner leaves behind little signals of its presence. Lint-free wipers don't break up and leave little pieces of cloth all over the place.

Clean Up Your Act

On the more mechanical side there are some interesting products for printers. The **daisywheel cleaner** takes all the carbon deposits off daisywheels that have caked onto the letters, to give crisper, clearer type. The **platen prep conditioner and cleaner** is for rubber printer platens - the platen being the roller that sits behind the paper to take the impact of the printhead. Platen prep cleans any carbon deposits off this and conditions the rubber so it won't crack or harden.

There is even an **anti-static carpet**

spray that can be sprayed on carpets around the computer to prevent static electricity. There is nothing more frustrating than walking up to give your computer a pat and feeling that little surge of power from your fingers that tells you the little beggar just went off with the pixies. If you have checked out the price of anti-static mats this may appear as a viable alternative.

If you like you can buy a kit that contains all the external cleaners and wipers. This will cost between \$20 and \$30. An added bonus is that most of the products are not incredibly dangerous to eyes or if swallowed.

Computer cleaning is very important, but people generally don't seem very aware of it - they treat computers like their cars, and only clean them once a flood or on their birthday. *Your Computer* certainly got a rude awakening and a pleasant surprise when we looked at this range of cleaning products, and even we have started to consider cleaning as a very important part of the general care of our equipment. Take a look at your own computer; could it be cleaner? (In our case, I'm not sure they could have been dirtier ...)

Your Computer has, fortunately, risen Phoenix-like from the ashes - all new, all gleaming, all twinkling, with a sparkle in our S-100 bus and a twinkle in our terminal. Yes, folks, the old rag scrubs up pretty well.

For more information on cleaning products contact Peter Vincent at Bonella, 790 Pacific Highway, Gordon 2072, or phone (02) 498 6241. □



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In this article, Andrew Farrell describes the features of a new BASIC language which enhances the capabilities of the Commodore 64.

BC Basic

BC BASIC was not, as the name may imply, developed in the days of Fred Flintstone. Commodore, in its usual wisdom, gave the 64 lots of great features: sprites, high-resolution graphics, a sound synthesiser, smooth scrolling, and the list goes on. But none of the above reasons to own the machine are supported directly from BASIC. It's a bit like putting a VW engine in a Rolls Royce chassis. Thousands of Commodores are still sold, so I doubt that Commodore is worried; but that leaves thousands of users struggling with PEEKS and POKES.

That, folks, is where BC BASIC comes into the picture. It's a bigger and better BASIC to help you get more of the Rolls Royce and less of the VW.

Simon's BASIC has attacked this area in the past, though its non-availability hardly gave that program the chance to succeed. BC could be the answer; it costs the same as Simon's (\$80) and does almost as much.

Starting Up

Having placed the cartridge firmly in the expansion port at the back of my 64, I was confronted with what could almost be described as stone age graphics. The opening credits are worse than rough — they're plain ugly.

I hoped things would improve, and decided to read the manual. (What a totally illogical thing to do.) It said, "Welcome to the world of BC BASIC programming". How sweet. Now to business: what does BC BASIC do?

Ah, here we are — BORDER, PAPER and INK followed by a choice of colours defined by the numbers 0 to 15. The BC BASIC authors just removed the two most often used

DUNNO WHAT THEY
MEAN BY "STONE AGE"
LOOK AT THIS BEAUTY
...PURE SILICON...



DEMONSTRATION OF BC GRAPHICS

POKE commands on the 64 and replaced them with a meaningful word. What bliss!

All these extra commands may also be abbreviated in the normal manner. That is, by typing the first letter followed by the 'shifted' second letter (BORDER would become 'B' shift 'O'). This simple form of entry is much better than having full words devoted to specific keys, and is also very simple to remember.

Several other commands position the cursor and perform colour tests. These may be used in animation, or just for organising your screen layout much more quickly than printing 27 cursor rights.

Hitting Below the Belt

On page eight of the manual I found some gibberish about binary and hexadecimal notation. A brief plunge into the world of 1s and 0s prepares the user for the complicated parts that follow.

The program incorporates facilities which would be of use to both

hackers and beginners. For example, PRINT %01001001 gives the decimal value for the binary number after the '%' sign, while PRINT \$FFD2 returns the decimal for the hexadecimal value after the dollar sign.

BC BASIC also lets you create user-defined graphics and design sprites. A whole range of commands are used to turn on a sprite, and set its colour, position and size. Personally, I found the way in which the sprite is stored a bit messy, compared to using a special editor to design it.

Procedures and High-Res

In using BC BASIC I found a knowledge of Pascal didn't go astray. A specific routine may be defined and called up later by name, using the PROC (name) command. In a way, this is just a shortcut to adding real commands that BC doesn't have. For example, when I got into graphics the manual informed me that to draw a circle I should use a specific PROCEDURE, and went on to list the necessary BASIC lines. Such methods are flexible, but a little untidy.

In high-resolution graphics mode the screen has a resolution of 319 by 200 pixels. Different points may be plotted, drawn and tested. Multicolour mode is also supported, with a resolution of 200 by 160 pixels — unfortunately detail has been sacrificed for extra colours. It may all sound fairly run-of-the-mill, but if you've never seen your 64 do interesting things with graphics you don't know what you're missing.

Sound

'SID', as the sound chip is often known, is a powerful thing to have sitting in a personal computer.



'Attack', 'decay', 'sustain' and release are all explained and supported well by BC. A few useful programs are included, one of which calculates the necessary frequency for each note playable by the 64.

Filtering and ring modulation are also explained in some depth. The music commands are all there, but as usual they are at a somewhat basic level for most people. Commands include 'Sync', 'Ringmod', 'ADSR', 'Pitch' and 'Cutoff', to name a few.

The manual also gives an interesting tip on how to connect the 64 to your hi-fi system, or even chain several 64s together. Output from the first machine would be connected to the second, whose output would then connect to the third, and so on. The final machine would connect to the hi-fi system in the normal manner. I can see it now. "The London Symphony Orchestra was recently replaced by a daisy chain of Commodore 64s running BC BASIC ..."

Interrupts

Sprites may also be made to move while other things are going on. Using the SPRGO command an object or shape may be sent flying across the screen, from a specific start position, at a variable velocity, to a new position. This type of command affects the interrupt routine, which occurs around 60 times a second, so it may slow things down a little.

Structured programming is supported, allowing programs to be shortened considerably. The 'IF ... THEN .. ELSE' and 'REPEAT ... UNTIL' statements are often a part of larger BASICs, so it was good to see them here. Other simple additions have also been made, such as RESTORE (line number), GOTO (exp), GOSUB (exp) and INSTR\$ (finds a string in a string). Handy features like KEY (define function key), PADDLE, PORT (user port access), BIN\$ and MSAVE have also been included.

Conclusions

BC BASIC has the commands that should have been in the 64 to start with, plus quite a few extras. The documentation is good, although perhaps a little confusing for beginners. Most importantly, everything I tried worked.

Of course, language cartridges such as BC BASIC suffer from one small problem which cannot be overcome: programs written with the cartridge won't run without it. I'm not suggesting they should, but it is a pity you can't pass on a copy of your working programs to others.

For most of us, this is no great drawback. Much satisfaction can be gained from just using BC yourself. Overall, BC has a lot going for it. The technically-minded will love it. Beginners may be a little lost.

My review copy came from Micromail, the Australian distributor of BC BASIC. For further information, contact Micromail on (02) 449-5600. □

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The Labtam 3006 is an Australian-designed and built microcomputer that meets the highest specifications and requirements. It was originally built by the company for its own use in scientific applications, but proved to be such a top performer that other companies wanted the chance to use it — so Labtam started building them commercially.

You can win a Labtam 3006 plus many extras, worth a total of over \$14,000, by entering the Great Aussie Software Competition.

The GREAT AUSSIE SOF

The Prize

The winner of the Great Aussie Software Competition will receive a model 3006 floor-standing Labtam computer, including a 15-slot IEEE-796 multibus motherboard and switched mode power supply.

Included within the cabinet is a Z80A CPU running at 5 MHz with 128K RAM, and an Intel 8086 CPU running at 8 MHz, also with 128K RAM. Labtam is also supplying an extra 128K of RAM, bringing the total to 384K.

CP/M-86 for 16-bit operation and CP/M 2.2 for 8-bit operation are included, as well as MS-DOS. Labtam is also giving the winner copies of Wordstar Professional and Supercalc 2. Battery back-up is supplied for the real-time/date clock and time counter.

The desktop console is Labtam's own high-resolution terminal and keyboard, which enables the provision of REGIS graphics. Storage on the system is via a

20 cm floppy disk drive providing 1.2 megabytes of storage, plus a Winchester disk drive with 10M.

To complete this outstanding computer system, Anderson Digital Equipment has donated a **Mannesmann Tally MT 160 printer** to provide output from the machine. The MT 160 is a high-resolution printer with graphics capability, and prints at 160 characters per second.

More Prizes

The second prize, a **Mannesmann Tally MT 80 Spirit printer**, has also been donated by Anderson Digital Equipment and is worth around \$800. It prints at 80 characters per second and provides such features as underlining, bold face, super and subscripts, italics and a special graphics mode.

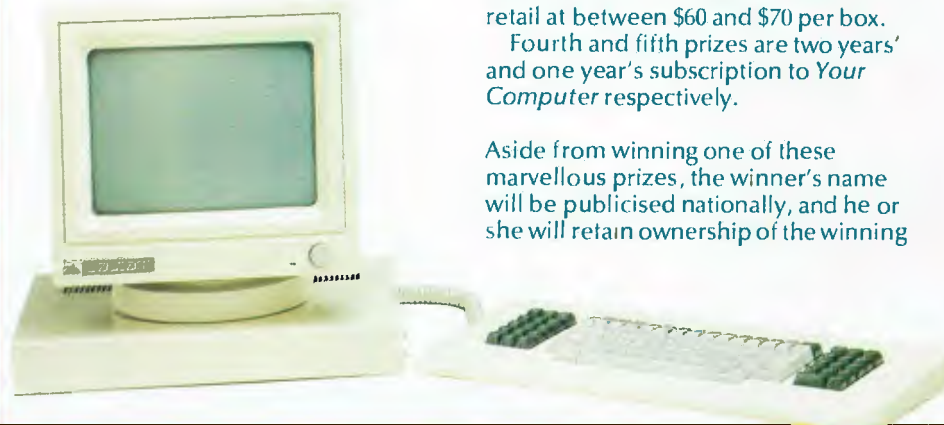
Third prize, donated by Magmedia, is **three boxes of Xidex precision flexible disks**, either in 20 cm or 13 cm format, as the winner wishes. These diskettes retail at between \$60 and \$70 per box.

Fourth and fifth prizes are two years' and one year's subscription to *Your Computer* respectively.

Aside from winning one of these marvellous prizes, the winner's name will be publicised nationally, and he or she will retain ownership of the winning

program to market, publish or otherwise use as they please.

The winning program does not necessarily have to be super-complex or business-oriented. The spirit of the competition is to reward original Australian initiative in producing a well-written, well-structured, useful and innovative program. It should reflect an original approach to solving a problem (regardless of its size or complexity) by the use of a computer.



All you have to do (all! we say) is write an original, innovative and useful program for any application you choose, and send it in to *Your Computer* for evaluation. Our panel of judges will whittle the entries down to a short list, and then subject these shortlisted finalists to a thorough scrutiny.

Our judges are all people well experienced in the world of programming: Les Bell, founding editor and now contributing editor of this magazine, and a well-known software consultant in his own right; Matt Whelan, former Managing Editor of *Your Computer* and now head of this publishing company's EDP department; and Dr Barry Thornton PhD, DSc, dean of the Faculty of Mathematical and Computing Sciences at the New South Wales Institute of Technology. Dr Thornton is also Chief Executive Officer of the Foundation for Australian Resources — which he set up nine years ago — and was Technical Director and General Manager of Honeywell for eleven years.



SOFTWARE COMPETITION!

Format

We'd like to be able to test your programs on a Labtam computer, so here's some information about its specific escape sequences and so on.

A Labtam terminal behaves like an ANSI-standard terminal, or alternatively can use VT52 cursor positioning escape sequences. The people at Labtam have also implemented a subset of the DEC REGIS graphics set, although they warn that they haven't incorporated all the more intricate options.

If you'd like more details about the Labtam escape codes, write to us and we'll send you a photocopy of the actual manual — we just don't have enough room here to list them all. However, if you follow the above standards and don't go into the intricacies of various subsets, Labtam tells us it should all be straightforward.

1. The program must be in a language compatible with CP/M 2.2, CP/M-86, MP/M-86, MS-DOS or IDRIS. In the event that a program is submitted under MS-DOS, it **must not** be hardware dependent (i.e. IBM-PC).
2. The program must be submitted on an IBM-compatible, single-sided, single density, 20 cm diskette, or an IBM-compatible (under the above operating systems) 13 cm diskette.
3. A short written resume of the program should accompany the entry, and it should be in a printed listing or typed form.
4. All entries must be accompanied by an original coupon from 'Your Computer'. The coupon must be signed, and in the case of a joint effort from, for example, a company, the signature must be by someone authorised to sign on behalf of the company.
5. The judges' decision is final and no correspondence will be entered into over the competition, nor any interviews granted.
6. No employees or relatives of the Federal Publishing Company Pty Ltd, Eastern Suburbs Newspapers Pty Ltd, or Labtam International Pty Ltd, their advertising agencies or associated companies, are eligible to enter.
7. The competition will run in 'Your Computer' for four issues from June to September 1984 inclusive.

and entries will close by the last mail received on September 30, 1984.

8. Entries which do not comply with these conditions, including entries received after the closing time, will be disqualified.

9. All entries, whether disqualified or not, will be returned to the appropriate participants.

10. The winning program remains the property of the author for him or her to use and apply as desired.

11. The prizes in the competition have no monetary refund value, are not transferable, and cannot be substituted or varied.

12. The competition will be judged by a panel of experts, which will use its best endeavours to see that every entry is properly considered.

13. Any omission to consider any entry and/or error by the judges or by any representative of Labtam International Pty Ltd or Federal Publishing Company Pty Ltd shall not invalidate the competition or give rise to any rights in any competitor to take proceedings against either of the promoters of the competition or any officers or employees of either of these companies at law or in equity on any account.

14. All competitors taking part agree as a condition of entry to accept the judges' decision as final and binding.

ENTRY FORM

GREAT AUSSIE SOFTWARE COMPETITION

Please complete this entry form and send it, with your program and resume, to **Great Aussie Software Competition, 'Your Computer', 140 Joynton Avenue, Waterloo 2017.**

In the event of a joint entry, please list separately the names (and, if applicable, job titles) of the competitors.

Name 1 (and job title):

Name 2 (and job title):

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I declare that the attached program is original and has been written by me/my group*.

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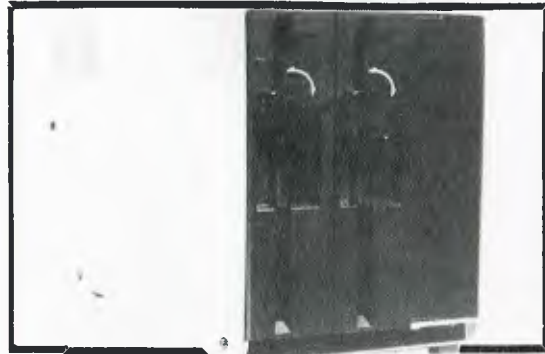
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MANY EDUCATIONAL institutions are using BBC networks in preference to stand-alone machines – not only because of the lower cost, but because it makes system management much easier. Those of us without access to a network occasionally need to be aware of the demands a network environment makes on program users and program code when developing software which might be used on a network.

First the good news: there's more memory available than when you're using a disk system. 'Page' on a disk system is at &1900; with a network it is &1200 (though a machine with network and DFS ROMs installed has 'page' at &1B00, as each needs its own workspace).

The rest of the news is that every time the disk is accessed in a network, you can expect a wait of up to 10 seconds. This is because there might be a dozen other terminals accessing the same disk at the same time. It isn't much of a problem at the start of a program, but care is needed in selecting the best point to 'chain' from one part of a program to another, or to load a file. Always remember to put a polite 'Please wait' on the screen before such an access: it will reassure users that they haven't done something drastic, and probably won't even be noticed by someone using the same program on a disk system if you CLS immediately after the access.

The same reason lies behind the preference of most experienced network programmers for using sequential files wherever possible. Random access files can be very efficient on a disk system, but the frequent pauses in a network environment can cause frustrating delays.

Problems can arise when trying to use programs developed on a network with a disk system, due to the latter not having memory between &1200 and &1900 available. Fortunately this area of memory isn't used very much by the disk system, so it's usually safe to move the program down to &1200 before it runs. Use this routine, or something like it:

```
10 IF PAGE<&1200 THEN *KEY 0 *FX225,128:M FOR A%=0 TO (TOP-PAGE)
STEP4:A%!*1200=A%*PAGE: NEXT:PAGE=&1200:M OLD:M RUN:M
20 IF PAGE<&1200 THEN *FX138,0,128
30 REM Main part of program follows:
```

The *FX225,128 resets the function keys' base number to 128, in case it was altered in a previous program. Remember, you can't have 'page' at &1200 with the disk system if the program uses random access files! The 'OLD' command is vital after shifting a program around, otherwise the interpreter will be looking for variables in the wrong place.

A particularly important thing to remember when naming files for use within a program is to keep them in the same directory as the program itself. Don't be tempted to change directories during a program.

ROM Software

There is an amazing, and growing, variety of ROM-based software advertised in UK magazines. I've been using the 'View' word processor daily for over a year and I've never regretted buying it, particularly now that there are some printer drivers around which are considerably more versatile than Acorn's. 'Wordwise' users show equal enthusiasm for the convenience and reliability of this type of software. Next time I'll be looking at yet another word processor ROM, Edword, which is designed for school use.

Utility ROMs abound, offering editors, assemblers, disassemblers, disk system enhancers, memory and screen dumps, new fonts, and so on. A terminal emulator ROM can make your Beeb look very like a VT100. Good databases and spreadsheets have been a while coming, but recently a database was released which can cope with up to 80K of data when used with disks. The availability of the 6502 second processor means that very much larger spreadsheets should be possible.

Language ROMs are also becoming more numerous: BCPL, FORTH and Tiny Pascal have all been around for a while. Having been told so regularly by so many people that Logo is only a month or two away, I find further rumours beyond my limits of credulity. Nevertheless, I'm an optimist, and having heard that a full implementation re-

ally is (ho, ho, ho) just about ready, I just can't give up hope yet. Given the length of time it's been coming, it will no doubt be packaged in hand-carved, personalised ROMs made from purified turtle droppings.

More About Speed

Thank you, the reader who spotted my 'deliberate' error in the discussion about the relative speed of GOSUBs and PROCedures in BBC BASIC (...just making sure you were paying attention!) The error wasn't in stating that GOSUBs are faster than PROCs (because in short programs they are), but in giving the impression they are always faster. In fact, the longer the program and the further down the listing the subroutine lies, the slower the program will run. Procedures, on the other hand, take the same time for the interpreter to find no matter where they are located, although this time is longer than it takes to find a subroutine near the start of a listing. Puzzle: where does the break-even point lie? I'll leave that one for you to sort out.

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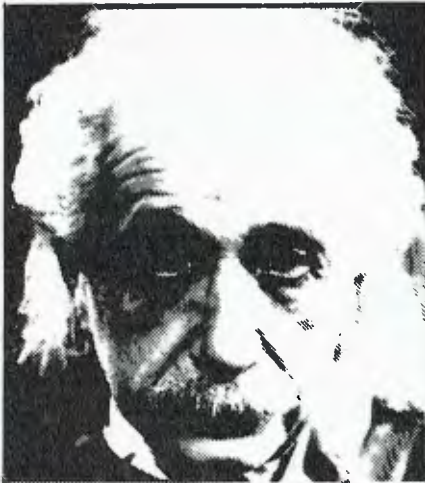
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WHEN YOU prepare a plot using PrintGraph, one of the options given is to use colour or black and white. The manual says to use colour "to take advantage of an RGB colour monitor, or to prepare for use of a colour plotter or printer". Although a note mentions that each data range can be a separate colour, even with the B&W option in effect, the meanings of the different alternatives may not be clear.

If you use the B&W option when you 'save' the graph, PrintGraph will print the result in black on any normal monochrome printer. 1-2-3 will accept up to six data ranges (A to F) and allows you to distinguish between the ranges by using a different cross-hatching pattern for each one. However, if you use a colour printer or plotter, two further options are available to you.

Selecting the 'Colour' option displays two additional colours on an RGB monitor (red and blue; the first and fourth data ranges are always displayed in white). In a bar chart, solid-fill bars are plotted. This is the 'normal' colour option. If, instead, the graph is saved with the 'B&W' option, it can still be printed in colour. As before, colours are selected from the PrintGraph options menu. The difference is that this time the bars are cross-hatched instead of solid-fill. Aesthetically, the solid fill is probably better, but the crosshatch alternative is quicker and makes for great savings in the use of expensive plotter pens.

So, the best solution may be to produce a draft in cross-hatched (B&W) form, and a final copy in solid bars (colour). If you have several graphs using the data from the one worksheet you will need to 'name' and 'save' each graph, so you can recall them later to change the colour option. If you have only one graph for a worksheet, using /File Save

range, select /Graph A...F and press Backspace. This cancels the last range setting and moves the cursor back to the position you previously selected. Try it - you'll find it a great time-saver.

Details of this and other procedures are to be found in the glossary at the back of the manual. It is well worth reading through the glossary as it contains a lot of information that either doesn't appear in the main parts of the manual or is hard to find.

When you are in the 'Select' command of PrintGraph, you can select a graph for printing and before hitting Enter, press the F10 (Graph) key to show a preview of the graph on the RGB monitor. The appearance of this preview is governed by how the graph was saved: 'colour' displays in solid-fill bars and 'B&W' in coloured cross-hatching. To my eyes, the red displayed in these two formats looks quite different. It must be the same, so the difference is an illusion caused by the black background on the cross-hatched bars. It is an interesting effect, though, and worth examining.

The Hewlett-Packard 7470A two-pen plotter pauses after every two colours to allow you to change pens. The H-P 7475A six-pen plotter pauses once to allow you to load the number of pens (up to six) you require. With either plotter it is not immediately apparent what order to use in loading the pens. Sometimes you can find the program asking you to load the pens in the reverse order to that in which you specified the ranges.

The PrintGraph program lists eight colours in one of its menus (Options/Colour/Grid or A B C D E F), which is rather effectively hidden. This list also appears in the manual, where it is even harder to find; it's in the list of 1-2-3 and PrintGraph Command Trees on page

and thick for solid-fill), you can specify one of the unused colours (like brown) for the second pen of the same colour. The pens you load don't have to conform to the colours shown in the menu.

Black and White Prints and Plots

The IBM dot matrix printer provides two character sets, which are software selectable. Character Set 1, selected by ESC 7, covers the 'normal' range of characters (ASCII 32 to 127) and some special characters in the range ASCII 10-31. Character Set 2, selected by ESC 6, covers the ASCII range 128 to 255. This includes all the foreign language characters as well as graphics symbols.

In contrast, some Epson printers offer eight character sets for the special symbols used in different languages. One symbol used frequently in 1-2-3 is the backslash (\), which is available on Epsoms only in the US, English and Italian sets. Most printers in this country would use the US or English setting; the only difference between these is the US#, which in the English set becomes a pound sign. Setting the default character set is normally done by setting hardware switches (meaning you have to dismantle the printer), but can also be done by set-up control codes (\Print Printer Options Setup).

The format for the set-up code is \027\082\00x, where x is a digit between 0 and 7. The meaning of each is:

- | | |
|-----------|-----------|
| 0 USA | 4 Denmark |
| 1 France | 5 Sweden |
| 2 Germany | 6 Italy |
| 3 England | 7 Spain |

Going Backwards

Some more information from the glossary section of the manual:

■ Pressing the 'Esc' key takes you back one step. Each time you press 'Esc', you'll be returned to the previous screen.

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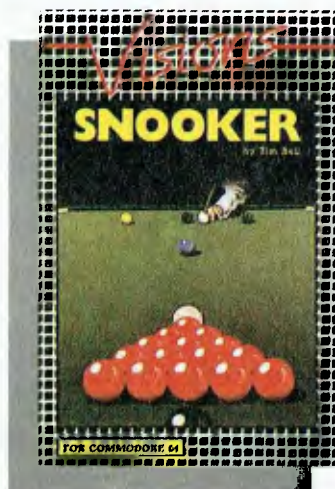
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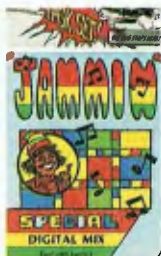
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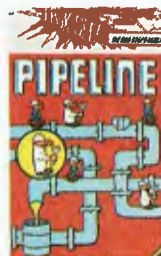
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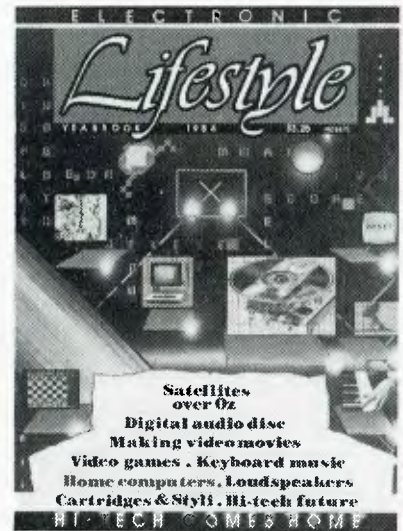
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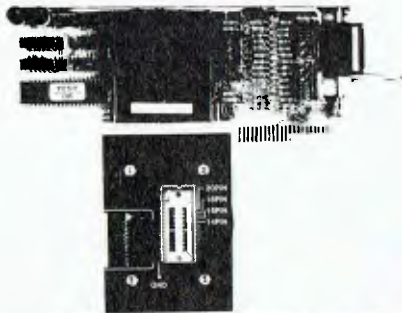
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Language:	Extended Microsoft BASIC	Expansion:	2 expansion sockets providing all major Z80 control lines
Colour:	16 foreground and 8 background colours	Audio:	Programmable under BASIC
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Sunday 23 September

Victorian Kaypro Users' Get-Together

The Victorian Kaypro Users' Group meets on the fourth Sunday of each month, and a regular newsletter is published prior to each meeting. Meetings are structured around a question and answer format with a guest speaker. The group is soon likely to begin tutorial sessions as well as meetings. Victoria College Burwood Campus, Burwood Highway, Burwood. (03) 857-5462. 2.45 pm. Annual membership \$20.

Tuesday 2 October

The Victorian Lotus Users' Association

This association has over 250 members in Melbourne, and last month they demo'ed the new Lotus product, Symphony. It will be more of the same at this meeting. Visitors and members will have access to an IBM-PC, and be able to exchange Lotus models. Membership (\$20 pa) includes a monthly newsletter. The Light Car Club, 46 Queens Road, Melbourne. 5.30-8.30 pm. Enquiries: Rod Taylor (03) 267-4800. Free.

Friday 5 October

Sydney Home, Personal and Small Business Computer Course

This ten-week theoretical course gives a general introduction to microcomputing. It covers the jargon, the parts of a computer, programming languages, games, graphics and other software; teaching by lectures. For bookings ring the Workers Educational Association and ask for their course program which contains the requisite form. WEA House, 72 Bathurst Street, Sydney. (02) 264-2781. 6pm. \$42.

Saturday 6 October

Melbourne Apple Users Meet

The Melbourne Apple Users Group meets on the first Saturday of each month, and its newsletter contains details of each meeting's topics. For more information contact David Halprin. Victoria College Burwood Campus, Burwood Highway, Burwood Vic. (03) 387-3221. 1.45 pm. \$15 annual membership.

Saturday 6 October and Sunday 7 October

Sydney Data Processing Concepts Seminar

This seminar is aimed at computing beginners, and promises to banish fears of computers and give you an understanding of computer systems - all in one weekend, courtesy of the WEA in Sydney. WEA House, 72 Bathurst Street, Sydney. (02) 264-6701. 10am-4pm. \$35.

Sunday 7 October

Queensland TRS80/System 80 interest Group

This club reckons it is rapidly becoming the sole source of information in Queensland for old Tandy owners, and its members are mainly business-oriented. Lindum Progress Hall, Lindum Road, Lindum Qld. (07) 396-2998. 1.30pm-4.30pm. Free.

Sunday October 7

Microbee Users of WA

The Perth Microbee Users meet each month at the Nurses Lecture Theatre, where many of WA's other computing groups also meet. Membership (about \$12 pa) allows you to access the cassette/disk/book/magazine library, and to receive the monthly newsletter. Now available are the public domain FOG library disks, so take your Microbee. Nurses Lecture Theatre, Sir Charles Gairdner Hospital, Shenton Park, Perth. 7-9 pm. Free. (09) 447-5366.

Monday 8 October

South Australian Osborne Users' Group Meeting

This group meets regularly every month, and membership costs \$25 per annum; for this you get access to the club's 164 disks full of public domain programs. The Institute of Technology, South East Corner, Front Building, Adelaide. (08) 261-6925. 7.30pm-9.30pm. Free.

Monday 8 October

Sydney Apple Users' Group Meeting

This is probably Australia's largest user group; around 300 members sometimes show up on the second Monday of every month. They cater for Apple and Apple look-alikes. This month honchoes from Apple Australia's head office will demonstrate software for the Macintosh. The Science Auditorium, Sydney Grammar School, Cnr. Stanley and College Streets, Darlinghurst NSW. (047) 36-4448. 7 pm. Free.

Wednesday 17 October

Melbourne PC Users' Group Meeting

The Melbourne PC Users' Group is mostly for business and professional users. It hopes to become the core of a national PC users' association. Its meetings usually begin with a question and answer session, followed by an individual presentation then general questions and socialising. Clunies Ross House, 191 Royal Parade, Parkville Vic. (03) 605-2222. 5.30 pm. Membership \$25, \$15.

Monday 17 October

Sydney Microcomputer Enthusiasts' User Group Monthly Meeting

This club, probably Australia's oldest, has regular monthly meetings at this hall. It attracts all sorts of members, from business people to students; anyone can join for \$15 per year. The group attracts a lot of mainframers who have much to learn from micro people and much to teach. St Andrews Presbyterian Church Hall, 37 Anderson Street, Chatswood NSW. (02) 638-1142. 7pm-10pm. Free.

THINK AHEAD FOR ...

Thursday 8 November and Friday 9 November

Schools Symposium - Eleventh Australian Computer Conference

Now almost a traditional part of the big daddy of computer conferences held each year by the Australian Computer Society. This side event caters for students in Years 10-12 and the tab is being picked up by Apple Computer Australia. If you are an eligible student hurry up and write to Mr John Hughes, School of Computing, NSW Institute of Technology, PO Box 123, Broadway 2007. (02) 20930. Royal Agricultural Showgrounds, Sydney.

Sunday 18 November

Sydney Apple Users' Group 6th Birthday Sale

A gigantic buy, swap and sell of Apple and Apple-compatible equipment. Club secretary Frank Revill expects about 700 to 800 people along. Sydney Grammar School, Science House car park, College Street, Darlinghurst NSW. (047) 36-4448. 12 noon-5pm. \$1.00. □



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GET AMONGST THE ACTION!

Australian **SCANNER'S WORLD**

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THIS MONTH the column features reviews of Wizard of Wor, Candyman and Mouskattack.

We're Off to See the Wizard

Wizard of Wor is marketed by the American company Roklan, and is based on the arcade game of the same name. Briefly, the object of Wizard is to destroy the forces of the Wizard of Wor. You are given three, five or seven 'Warriors' to accomplish this.

At the beginning of the game you are confronted by one of fifteen screens (learning these fifteen screens intimately can mean the difference between life and death). You then have ten seconds in which to begin playing, after which you are forced to begin.

To start with there are seven blue Burwors (blue in colour because the Wizard's favourite colour is blue). After you've destroyed these (while, of course, they are trying to destroy you) they are replaced by Garwors, their cousins, which are a scaly yellow colour and sort of waddle along. Once conquered these are also replaced, by Thorwors, the deadliest of the common monsters, who are a smooth slick red colour. To add problems in layers, Garwors and Thorwors have the Wizard-given gift of invisibility, and usually only appear when they are in the same corridor as your 'Warrior'. Their approximate position can be determined by the radar at the bottom of the screen.

After the 'common' monsters, the Wizard's favourite appears: it is Worluk, a winged monster that flies through the maze trying to escape. It attempts to exit on the opposite side of the maze from which it entered. However, because it is a bit psycho, sometimes it exits on the same side. Anyway, if you nab Worluk, points in the next dungeon are double.

Then there's the Wizard. He is fun, disappearing and reappearing at random throughout the maze, shooting lightning bolts like they were going out of fashion. Shooting him earns 2000 points, and, especially in a double-points dungeon, this can be quite helpful - but he is sneaky.

After each dungeon the movement gets a bit more frantic, and killing those Garwors, Thorwors and so on becomes more and more difficult. However, you receive an extra Warrior after dungeon three.

The fourth dungeon, called the



'Arena', is the first special screen and has a large open area in the centre - a great hiding place for the invisible monsters. Also, after dungeon eight, your status is elevated to that of a Worlord.

After the Arena, the next 'special dungeon' is number 13: the 'Pit'. The Pit is free of all barriers - just one dungeon, with you against them ... nowhere to hide. No strategy works here, just sophisticated manoeuvring, intestinal fortitude (that's guts), and a lot of luck.

Getting through the Pit without losing a Warrior earns you the title of Worlord Supreme..

And in case you get through the first Pit all right (you get an extra player here), there are others at dungeons 19, 25, 31, 37, 43 and so on (where you get no extra players).

I'm afraid, however, that I must take the instruction manual's (excellent, and humorous) word for this talk of a Pit every six dungeons, as I'm still trying to get to the first one.

All in all, a totally engrossing game, and very challenging ... now where is that damn Thorwor ...?

Mouskattack - Attack of the Killer Rodents

A good premise for a game, which came hot on the heels of the endless 'Pacman' variations, but I'm afraid it just doesn't live up to its promise.

You are Larry Bain, ace plumber of Rodent Rooter Plumbing Service. Your partner (it's two-player if you wish) is Peter Pipefitter of Peter's Piping Service, and he must venture with you underground to install pipes through as many levels of Rat Alley as possible.

This game could be seen as Pacman in reverse: while with the Pacman you have to clear the dots, here you have to fill the maze with 'pipe' and avoid marauding mice.

You are ably assisted by your two cats, which the mice are afraid of. The mice won't go through a cat, but simply holding a cat while you travel won't protect you. Also, your cats are not big enough to deter SuperRats at all. These giant rodents will eat them *whole*. Wow! You have to grab your cats out of the way of these S-Rats if you can. If you're playing with a friend, beware of his cats and he yours, as you can't run through another player's cat.

Now and then the mice will get trapped in mouse-traps. Bonus points can be obtained by 'running over' them while they are trapped.

Overall, while the music and sound effects are quite effective, the game itself is disappointing. An especially annoying point is that when the maze appears to be full of pipe, one joint may still be open, and you must run blindly around the maze trying to guess where it is.

Mouskattack comes from Online, and so does Candyman ...

Candyman

Now this one I like - the first version, at least. Unfortunately the first version was too like Pacman for the copyright owners to handle, so Online redesigned the game and there's only one way to describe the maze form in the second version - yuk!

After the opening phrases of Candyman, you are presented with a chomping pair of teeth (representing you), and four colourful faces rolling around after you. You must travel around eating the sweets; particularly the larger ones that look like Lifesavers, as these are the power dots which give you extra powers over the faces. Bonus points of 200, 400, 800 and 1600 are obtained by grabbing these faces while they are re-treating - yuk!

Getting through the first few screens is relatively easy because these enemies are fairly stupid, then suddenly they get awfully clever. I'm half sure they know what you're going to do before you do it, but then maybe that's just a sign of good programming (or an over-active imagination).

After each screen an animated toothbrush comes out and cleans your teeth to prevent decay setting in.

Overall, this game has great graphics, sound and challenge. Even if you can only pick up the second version, get it anyway. It is a classic.

A Locked Door – A Dead Man

Deadline is produced by the amazing people at Infocom (of Zork fame).

In this adventure, which is the first in the Interlogic Mystery Series (Witness is the second), Marshall Robner is dead – presumed to have killed himself.

Simple? Not quite. Though most people are sure it's a suicide case, you must find a murderer. You begin your investigation at 8 am and have until 8 pm to solve the case.

You are confronted with a myriad of clues. A number of characters also move in and out of the Robner mansion throughout the day, some trying to help, others trying to hinder your search.

You are told at the beginning of the game that the will of the late Marshall Robner will be read at noon. You would do well to attend, if just to observe people's reactions and subsequent actions. There is also word of another, more recent will which is yet to be discovered.

It takes at least until the early afternoon, after the reading, till you can fully solve the puzzle. There is only one completely correct solution which presents the full story – or so someone who has solved it told me (but he won't tell me how to solve the thing).

To complete your investigation you must 'arrest someone'. A courtroom scenario follows to determine the outcome: the accused will be found innocent or guilty.

I know one thing for sure – make a mistake and the murderer may strike again. Make a tragic error and you may be leaving in an ambulance.

With the program disk you receive an assortment of material which makes interesting reading, if nothing else! Among the bits and pieces are a Coroner's Report, a letter from Robner's attorney to the police, a police report, a lab report, a photograph of the murder (sorry, death) scene, and a small packet containing three Ebullion tablets (sup-

posedly the 'killer').

Deadline, like the Zork series and other Infocom programs, recognises over 600 words and allows complex sentences. In Deadline you may also 'analyse something for something'; for example, 'analyse teacup for Ebullion'. You can analyse items for fingerprints, too. However, I can't seem to get anything useful out of doing this. Maybe I'm testing the wrong things.

Accusations, rather than arrests, are also possible; perhaps to gauge a person's reaction to being accused of murder.

Deadline is available at most computer stores for approximately \$90. If you can't get a copy, keep trying. It really is a good adventure.

That's it for this month. Please write if you have a comment, suggestion, or complaint:

PO Box 594
Maryborough 4650.

Magnetic Card Reader System

Today, the small slices of plastic known popularly as 'credit cards' have become substitutes for much, much more than cash. In fact, besides being an integral part of the "cashless society", the magnetic card has many uses such as checking out books at libraries, as a replacement for hotel keys, parking and identification verification, telephone calls – the list goes on and on.

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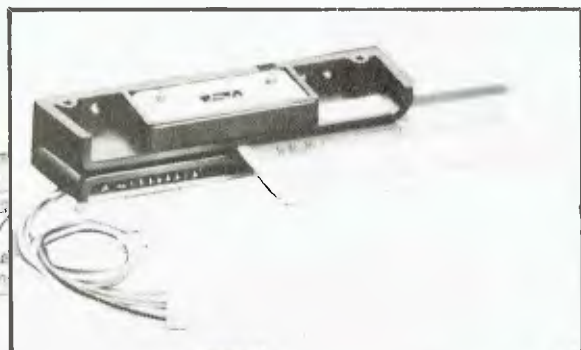
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From page 132

Wanted: Spectrum Printer. Phone (052) 73 9200 during business hours. Ask for William James and give phone number. I will ring you.

Epson Mx-100: Type II printer for sale. Takes paper up to 15 inches wide, tractor and friction feed. \$700 or make an offer. Phone Terry Day (02) 736-3277 (bh).

6502 Editor/Assembler System: for Apple II Plus with 48K and 16K extension RAM card. Full 70-page user documentation and three diskettes: one containing the executable object code and the other two the complete source code. Includes a full assembled source listing of over 120 pages! At last, access to the original well-commented source code allows you to incorporate your own tailor-made modifications. Excellent value - only \$99 including P&P. Contact Ian R Humphreys, 23 Faversham Street, Beckenham WA 6107.

Epson FX-100: Brand new ribbon cartridges - \$10.00 each. Itoh 8510/1550 - \$4.80. For fast service call or write to Kasumi Nakajima, 1/4 Durham Close, North Ryde 2113; phone (02) 888 2801.

Vic-20 (8K) 8K: With Data-Sette, joystick, many books, and educational, practical and games software. Items retail for more than \$1000. Urgent sale - \$400. Phone (053) 52 1472.

Sinclair ZX81: With 1K and two program books - \$35. B/W monitor, if required - \$15. Contact John (042) 61 4729.

Cat Programmers: Top royalties paid for good software: games, applications and educational. Submit on disk or cassette. Include documentation (printout and instructions) and return postage. Anglis Software Publications, 72 May Street, Preston 3072.

Microbee Quality Software: 'CP/M Utilities 1' contains a suite of 39 programs (over 200K) of some of the most useful CP/M.U.G. utilities available. All fully documented. Items: powerful CP/M monitor, disk catalogue system, multi-level sorter, disk add/delete directory with date setting, a type utility to scroll forward and backwards by line or page, comprehensive MBASIC help file, and so on. \$19.95 post paid. Contact B Proctor, 27 Roberts Avenue, Mortdale 2223. Prompt return guaranteed.

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Microbee Owner From Israel: Wants to correspond with the same about Microbee. Contact Zvi Cochav, PO Box 3455 Haifa, Israel.

Microbee Owners: I brought you the famous 'Microbee handi-chart', and now I bring you the 'Microbee key-keeper'. This hardware item is constructed of tough 2 mm thick acrylic sheet, moulded to fit snugly over your keyboard. This is a must for protecting key-switches from dust, dirt and liquids. Will prolong the life of your great machine. This is the original 'keeper', so don't be fooled by cheap imitations. It costs \$9.60 (including postage). Reply to JR Kocka, 14 Tanahmerah Avenue, Tanahmerah 4128.

System 80 Games: Top programs at \$5 each. Over 100 games. For a list, send a SAE to M Barclay, 4 Sibella Circuit, Greensborough 3088. Phone (03) 434-1082.

Apple III Computer System: with 256K, two drives, monitor, printer, Pascal software, manuals and games. Includes emulation to run most Apple II programs. Has a powerful operating system (SOS) with all the hardware features professionals look for, besides its outstanding applications software. Excellent condition. \$5350 ono. Phone Stephen (ah) (03) 233-8886.

Central Coast Apple Users Group: meets on the first Tuesday of each month at the Niagara Park Public School, from 7.30 pm. All Apple and Apple look-alike users are welcome. For further details phone (043) 84 3419.

Zorba Help: I need the source code of the foreign disk format, read/write program. D Yates, Botany, University of Queensland, St. Lucia 4067. Phone (07) 377 2070 (bh), or (07) 30 1460 (ah).

For Sale: Vic-20 Introduction to BASICS 1 and 2, games book, 16K Expander, draw poker, three games tapes, six assorted tapes including Vic typewriter, personal finance and so on. Cost over \$300 - will sell for \$180. Phone (043) 67 7429.

Microbee: 'Tax Form '84'. Prepare your own tax return. Interactive program calculates tax payable, rebates and so on. Prints 'S' or 'A' Forms and Tax Summary. Fully documented. Update option for future years. Suits 16K and popular printers. Tape - \$15. K Cousins, 9 Mair Cres, Korumburra 3950.

New England Applegware: On my sabbatical I collected 1000 good public domain programs. Only 182 of the best remain. These have been organised onto 10 copyable disks under a front-end menu manager. At \$180 for the lot (less than \$1 a program), you receive 10 labelled disks in a plastic box, plus three free BASIC Tutorial disks. 'Total Pac' includes business programs with auto file, Visimatrix, and trend analysis; BASIC Stats with T-Test, Chi Square, Bestfit and so on; Multiflex full-featured multiple regression; Editing Utilities with Utility Belt, Programme Editor, Memory Dump and so on; Disk Utilities with Razor Back-It-Up, Reconstruct Contents, Motor Speed and more; Machine Utilities with RAM Test, System Configuration, DOS Mover and others; Key-Operated Games, including Invaders, Depthcharges and Drawpoker; Arcade Games including Asteroyder, Parachute and Cyclejump; Education Games with Talking Numbers, Spellman, Animals and so on; and Best Graphics with with Shape Designer, Magic Pencil, Texograph

and many more. In DOS 3.3 with basic documentation on disk. No manuals and no rights reserved. Phone: (067) 72-1418. Dr Wade C Edmundson, 124 Handel Street, Armidale 2350.

Matchmaking 64: Similar to the television show, but now for the Commodore 64. A great way to match up your friends. An ideal game for parties. With personal password. Send \$20 to mark Sinclair, 5 Moresby Place, Allambie Heights 2100. Prompt Return Guaranteed. Cassette only.

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Microbee Custom-made Software: Cheap BASIC programs. Phone J McKay (047) 39 3154.

TRS-80 PC-1: Peripherals, printer cassette interface, cassette interface, manual, soft case and keyboard overlay - all A1 order (main unit was stolen). Offers accepted. Todd Cottee, 36 Brush Road, Eastwood. Phone (02) 858-3157.

VZ-200: Super word processor program with unlimited copies, editing, tape-filing and retrieval, full line, full punctuation, upper and lower case, needs Centronics-type printer. Also separate retrieval program. Cassette - \$20. Gordon Browell, 7 Abbott Crescent, Malak, Darwin 5793.

RAM Packs: Spectrum 32K - \$90; ZX81 16K - \$48; Sweet Talker's Spectrum - \$70; BBC - \$60. Contact DES, 22 Nellie Street, Camp Hill 4152.

ZX81: With 16K RAM pack, PSU and manual, and three software tapes (you decide whether games, utilities or item radio) - \$200 including postage. Other software available at reasonable prices. Phone (070) 61 3386; or send cheque to John Brennan, 10 Tulip Street, Innisfail 4860.

Top Prices: paid for used software for Sinclair Spectrum, ZX-81, VIC-20 and 64, or VZ-200. Send details to Peter McKay, RSD, Swan Hill 3585.

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Sharp MZ700 Users: Interested in forming a club or exchanging information? Contact Terry O'Connor, 5 Ficus Street, Brisbane 4113. Phone (07) 345 7417.

Spectrum Software: Over the Spectrum 1, 2 and 3 - \$12 each; MCoder \$18; VU-3D \$18; Horace Goes Skiing \$15. Contact J Patterson, PO Box 165, Huonville 7109.

System 80: 16K, including Dick Smith green phosphor monitor and manuals, excellent condition - \$350 ono. Phone David (03) 51 5330 (ah).

Computer ZX81: 16K with filler keyboard, printer and joystick. \$150 worth programs. \$150 worth books and magazines. \$300 the lot. Phone (08) 336 7609.

VZ-200 Software: 'Snake Maze' - three levels of difficulty. Joystick or keyboard. Send \$6 to B Low, 4 Teresa Easement, Labrador 4215. (075) 37 1330 (ah).

TRS-80/System 80: EPROM Programmer (2K and 4K). Software and documentation included. Socketed board - \$45. Fully assembled without plug-pack - \$150. Phone (03) 480 5936, or send SAE to Robert Carbone, 57 Woolton Ave, Thornbury 3071.

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FIRST OF ALL, let me apologise for my somewhat extended holiday from the pages of *Your Computer*. It was, of course, not the fault of any legitimate, external, out-of-my-hands reason, but my own deplorable procrastinating. Never mind, I promise to at least try to send in a column once a month from now on!

Anyway, I thought I'd start off my 1984 YC season with a liberal sprinkling of ZX reviews. I've got ZX Spectrum software coming out of my ears, so that's a likely place to start. ZX81 owners take heart; there'll be some ZX81 stuff in a few months as soon as I clear the backlog of all this infernal Spectrum stuff which is messing up my desk (not that my desk is particularly tidy without it). Meanwhile – on with the Spectrum reviews!

Melbourne House, one of the longest-running publishers of books and software for the Sinclair machines (what ZX80 owner doesn't have *30 Programs for your Sinclair ZX80?*), has recently entered the ZX Spectrum field with a range of books and software cassettes. This month I review part of their range of software.

Hungry Horace

Horace is perhaps the most famous software 'character' created for the Spectrum, probably due to a lack of whimsy in most of the arcade games that have come to pass. This program was the first of the Horace series (at present a trilogy), and its success no doubt led to the creation of the further two Horace exploits.

'Hungry Horace' is, like the other two Horace games, not entirely original. This one is a PacMan derivative, although it has deviated from the traditional Pac-Man mould considerably, and bears only a slight structural resemblance to the famous game.

Instead of being a round thing with an oversized mouth eating dots in an abstract maze while being pursued by several 'ghosts', Horace is a rather cute, semi-animated little fellow, who strolls around the park eating the flowers (thus the name). Also in the park are up to three guards, consisting of disembodied heads with marvellous shifting eyes, who will throw Horace out of the park if they catch him. Four catches and he isn't allowed in again.

If Horace manages to reach the alarm bell, the guards panic (with suitable face contortions) and Horace can then throw

them out. Occasionally the guards will drop their lunches and Horace, if he's quick, can gobble these up for additional points. At any time Horace can move on to the next maze (there are four, each harder than the previous one).

'Hungry Horace' is quite easy to play, although luck seemed to play an annoyingly large part (like in situations when it is impossible to move onto the next maze, or you are caught by the guards, regardless of your actions). The game also slows down when more guards enter the park. However, all things considered, it's a marvellous little game, especially for the graphics, and would be especially good for young children.

Hungry Horace is published by Melbourne House (rrp \$20) for the 16K ZX Spectrum.

Horace Goes Skiing

This is the second of Horace's exploits. In this game Horace has seemingly abandoned his penchant for flowers, and has taken up skiing. However, all is not as easy as it might be, for a busy road separates Horace from the ski rental shop (no relation to 'Frogger').

Horace starts with \$40, must cross the road, rent the skis (\$10), and recross the road to get to the slopes. If, alas, Horace should be struck down by a passing motor vehicle (all of which are superbly created and zip across the screen in a delightful fashion, complete with lane-changing by the speedier vehicles), the ambulance fee is \$10. Once Horace reaches the slopes, it's slalom all the way to the finish. He has to watch out for the trees, though, because three hits and his skis break; and then it's back to rent some new ones! If poor Horace should run out of money he has to risk his life crossing the road; every 1000 points gained venturing onto the motorway earns him \$10.

'Horace Goes Skiing', like 'Hungry Horace', is probably best for its superb graphics. The road is perhaps slightly too congested (and gets worse as the game progresses), which can be extremely frustrating. The controls are straightforward (same keys as 'Hungry Horace').

I quite like this game: it is fairly simple, has excellent graphics, and must be one of the better games around for the 16K Spectrum.

Horace Goes Skiing is published by Melbourne House (rrp \$20), for the 16K ZX Spectrum.

Horace & The Spiders

This is the most recent, and most sophisticated, game in the Horace series. In this game Horace must make his way up a mountain (?), cross the 'spider bridge', then do battle with the spiders on their giant web.

The 'mountain' consists of flat ground with small rises which Horace has to jump as well. The timing for these leaps is crucial, since slight mistiming results in the breakage of a 'spider serum' phial (of which Horace starts off with five). When Horace runs out of serum the game announces, "It is dangerous to go on" – notice how the designers are avoiding killing poor Horace off in any of the Horace games.

The 'spider bridge' is an odd inclusion, for negotiating it seems to rely totally on luck. Horace must cross the bridge by leaping from spider web to strand. If he stays too long on any one strand the spiders will pull him up, thus losing Horace another serum. It is no loss to the game to reveal that Horace can get to the other side just as easily if you keep your finger on the 'Q' key as he can if you try to time your presses of the 'Q' key in accordance with the moving strands. I think the author could have tried to include a bit of skill requirement in that segment, but understandably he would have been pushed for space, trying to fit all this (and the last part described below) in 16K.

The final arena places Horace at the foot of a giant spider web, with a bunch of spiders crawling over it. This part is obviously 'borrowed' from the game 'Apple Panic' (which was not entirely original itself, having been 'borrowed' from an arcade game of a different name). Horace must climb over the web, stopping to stamp a hole through it in strategic places. When a spider comes to mend the web, it hangs in the hole for a short while. In this position it is vulnerable, for Horace can come along and stamp on it, and providing there is not another hole underneath, it falls to its death. Once all the spiders have been duly stamped upon, Horace returns to the foot of the mountain, to travel over more of the mountain and more spiders.

'Horace and the Spiders', despite the inclusion of the unnecessary 'spider bridge' (although I suppose it adds to the suspense ...), and the leaping-spiders-on-the-mountain part which is surprisingly difficult, is very good value for money; probably more so than the earlier Horace games, mainly for the final

spider web part which is just as good as 'Apple Panic'.

The graphics aren't quite as nifty as in the other Horaces, but the game is more challenging and probably also has a better entertainment value lifespan than the others. 'Horace and the Spiders' is my favourite of the three. It is also published by Melbourne House (rpr \$20), for the 16K ZX Spectrum.

The Hobbit

If you own a 48K Spectrum and you haven't heard of the Hobbit, you must be devoid of sight and hearing! This program has received a tremendous amount of publicity, mainly in the computing press, although I'm not altogether sure why. While the Hobbit is quite a good piece of programming, has graphic displays of the 'main scenes', and can understand full sentences, none of these is new. Apple adventures with graphic displays have been around for donkey's years, and Infocom paved the way for adventures which accept full sentences years ago with 'Zork'. How-

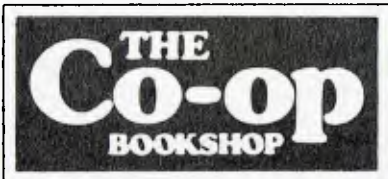
ever, this might be the first time such features have come together in the same program, and of course the Apple graphic adventures have the advantage of being able to load the displays directly off disk, whereas the Hobbit must store them in memory.

The Hobbit has another feature - it's called 'Animaction' by Melbourne House, and turns the Hobbit into an almost real-time game with the other creatures supposedly going about their business even while you're doing nothing. It sounds very impressive, but I'm not convinced. Most of the activities the other creatures do seem to be random; for example, Thorin (one of the characters) might sit down and sigh about gold, or Gandalf might go east and come back again, or alternate between giving you the map and taking it back again. Perhaps I just haven't got far enough into the game yet. It announces that I have got '12.5 percent' of the way into it every time I manage to kill Bilbo (the Hobbit which the player takes the part of).

Incidentally, the Hobbit is modelled on the book by Tolkien of the same name (which I imagine you've realised by now). In fact, they even throw in a copy of the book with the cassette, supposedly to give you the benefit of some extra clues. I would recommend you read the book before commencing the adventure, but you may like to try and play the adventure first and read the book later to see how you compared with the real Bilbo.

Now, the graphic displays ... These are quite well done, all in full high-resolution colour, and most displaying a fair amount of detail. Evidently they are based on specially commissioned drawings by the artist Kent Rees. My only complaint is that they take a while to form on the screen (the actual line drawing is done quite quickly - filling in the areas with solid colour takes time); otherwise, they form one of the most enjoyable parts of the adventure. A pity that only about one third of all the locations in the adventure actually have graphic depictions. Still, it's not bad

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when you consider that all the displays are held in RAM, together with the program itself.

I found the Hobbit to be enjoyable, despite its difficulty. I haven't completed it yet, but that doesn't mean it's impossible: any person who puts in the necessary concentrated effort for a few days would probably solve it.

In conclusion, the Hobbit is an excellent adventure game, but the special features of 'Animation' and the graphic depictions have been slightly overrated by Melbourne House's publicity department. It's also a bit pricey (rrp \$39.95) for Spectrum software, but cheap compared to similar games for other micros. It requires a 48K Sinclair ZX Spectrum to run.

Terror-Daktil 4D

I've left the worst till last. The publicity hype for this game was amazing – describing it as a "game so terrifyingly real that you'll need all your courage just to remain at your 48K Spectrum screen". I was looking forward to testing this game, and to say I was disappointed verges on being an understatement.

The game starts off with a slow and uninspiring aeroplane crash (a few clouds on a background, then a few mountain tops as the plane descends into Doom). Thankfully this tedious routine can be skipped on subsequent replays of the game.

You awake from the disaster to find yourself in a Lost Valley haunted by 'Terror-Daktils' intent on causing you sleepless nights.

A cannon (or pistol – the game's instructions are evidently undecided) is lying about for your defence. You can swivel the cannon up, down and sideways, and lob cannonballs in the general direction of the Hovering Horde of Dinosaurs, which are represented in what the publicity generously refers to as '3D'. Occasionally a 'Terror-Daktil' will break formation and swoop down upon you, evidently trying to knock you unconscious(?).

Terror-Daktil 4D is really very little more than an up(?)market version of 'Galaxians', the time-honoured space shoot-em-to-little-bits game, with the enemy in 3D form. The 3D effect, rather than improving the entertainment value of the game, detracts from it. Lobbing cannonballs becomes mere pot-luck, with little fast movement or wrist dexterity required. If you hit a swooping 'Terror-Daktil', good luck to you! There's no

point trying to aim for the damn things - you'll miss practically every time!

If you're wondering what became of the additional dimension (the fourth), it's the game's supposed time distortion. While you're sitting, bored out of your mind, taking pot shots at a group of hovering dots, a little sun slowly moves across the horizon from east to west (at what the blurb on the back of the cassette laughably describes as "an alarming rate"). Presumably when the sun finally goes down (I've never lasted the distance) the game gets harder as the scene darkens, and the 'Terror Daktils' become mere glowing eyes in the blackness. Horrors! I reckon they could have speeded the sun up a bit, because at its present speed it seems to take all day - real-time taken to the limit! And if you're knocked unconscious by a manic dinosaur before the sun goes down you remain unconscious all night, and you wake up next morning with the sun back in its starting position! Aaarrgggh!

I'm sorry, Alfred Milgrom (of Melbourne House); I don't like your game, which is a pity, because all your other stuff is so much better.

Not recommended.

'Terror-Daktil 4D' is published by Melbourne House (rrp \$22.50), for 48K ZX Spectrum machines.

That wraps up this month's Spectrum reviews – but by no means exhausts my stock; look forward to more reviews next month!

Some of Melbourne House's games for the Spectrum are also available for the Commodore 64 (at least the Hobbit and Hungry Horace are at present). Melbourne House is located at 4/75 Palmerston Crescent, South Melbourne 3205; phone (03) 690-5336.

Incidentally, if you're wondering if there is a decent ZX Spectrum club in Australia, look no further than AZUA – the Australian ZX Users' Association. (I happen to edit AZUA's newsletter, thus I tend to be slightly biased towards this organisation.) If you want some info on AZUA, send a self-addressed, stamped envelope to AZUA Recruitment Dept, 19 Godfrey Street, Campbell 2601. If you know of or are involved with any other ZX clubs in Australia, please let me know so the appropriate details can be inserted in this column and *Your Computer's* list of user groups. I would also be grateful if ZX software/hardware/services suppliers could send me something (anything?) about their doings and so on! (It all helps, you know.) See you next month. □

I'M AMONG the first to agree that the BASIC manuals leave a lot to be desired if you're looking for a full treatment of all the possibilities of our version of Microsoft BASIC. As it is BASIC, and is therefore interactive, the easiest way seems to be to try a few things and see what happens. I'm not so much advocating programming by trial and error as suggesting experimentation to see what will happen with a particular statement in a given set of conditions, and thereby probably learning in the process.

A case in point is screen formatting. Most people are aware of the great facilities provided by PRINT@, PRINTTAB, PRINT USING and so on; it is possible to combine these to get even more useful statements. I'm not going to go into detail on how to do this here. I hope your experiments will be of more value than whatever I could say.

INKEY\$ Storage

In the various references the manual makes to the INKEY\$ 'memory' function (which operates when it is unwanted), it also mentions memory address 4099H (16537D) where the character is stored in readiness for the next use of INKEY\$. It is suggested that you POKE a zero into this address immediately before using the function. This method does work, but I believe a better way is to assign a null immediately before calling the INKEY\$. A line such as INKEY\$ = "" will zero whatever key may have been pressed inadvertently, and will clear the contents for when INKEY\$ is actually used by the program.

It is also often bemoaned that INKEY\$ will only accept a one-character input. The solution is to build a string by using successive statements calling INKEY\$, either in a FOR NEXT loop or just by repeating the code.

While BASIC Levels 2 and 3 lack some of the frills of disk BASIC, exactly the same things are possible with often only a minimum of extra programming. Incidentally, I feel it's worth pointing out that I've observed most BASIC programmers don't use all the facilities of disk BASIC; possibly because they've learned to program without them.

Then Again

Some time ago I mentioned the pitfalls of omitting the THEN from an IF ... THEN test. It seems I need to mention this again, if the number of problems and complaints of a fault in the ROM BASIC are any indication. I consider it's

not a fault. Most of the time we can get by without THEN, but really it should always be there. On certain occasions (such as when adding an ELSE condition later) bugs will seem to develop in a program previously thought to be bug-free. Another trap is that some utilities (such as renumbering and packing) look for the THEN statement following an IF so they can work properly; and it follows that if they can't find one they won't work properly!

Another source of trouble is the insertion of unnecessary spaces. Many other versions of Microsoft BASIC require spaces to separate key words from normal program code (this is because their variables are not limited to two significant characters), but ours doesn't. Indeed, extra spaces will cause troublesome and unpredictable results. A particularly mysterious one is where there is a GOSUB within a multistatement line. A space after the line number of the GOSUB and before the colon separating it from the next part of the line will cause the interpreter to overlook the rest of the line. Perhaps it is a bug in the BASIC, but at least it's easy enough to overcome and won't ever reveal itself without those unnecessary spaces.

Connectors

I've previously advised installing gold connectors on the Model 1, to cure the problems caused by oxidation of the tinned ones on the edge connectors of the expansion interface and expansion slot of the keyboard. This is a particular problem when the extra memory is in the expansion interface (instead of in the keyboard where it is closer to the CPU and doesn't rely on a wire connection). I still stick by that advice: for \$25 you don't stand to lose a lot, and it certainly won't do any harm.

Another possible cause of these problems is the connection of the cable to the actual plug. If you've been having difficulties you probably tried unplugging and cleaning, which could well have made the contact less secure. The way to check is to wait until the fault shows up and wobble the cable and plug independently. True, if it is faulty such wobbling may well break the connection altogether, but then you really had to re-terminate it anyway!

The areas of concern are the cable connecting the expansion interface to the CPU, and the disk drive cable where it connects to the interface. Because

there are so many wires in both connections, it's almost impossible to give a list of symptoms. Some are far from obvious: such as the re-set button seeming to be inoperative because the 'click' it usually gives actually comes from the disk drive as it re-boots.

An allied fault which is less easy to fix can occur in the connections on the double-density board in the Model 1 interface. Despite the illegality of such things, there are some 'pirate' copies of the Percom Doubler board. The copies I've seen use pins that are far too big to fit properly into the socket in the interface, with the result that after a time the socket becomes stretched and unable to keep the doubler board in tightly enough to make proper secure contact. In fact a spring action develops which forces the board out. The remedy is to install the proper pins, which means taking off the two 40-pin sockets on top of the board; because the interface socket has become stretched it has to be replaced too. All these hardware items seem readily available in Australia now, which hasn't always been the case, and I suspect is the reason for using the wrong ones in the first place.

Work-Alikes

The System 80 owners among us will be familiar with the problems of incompatibility when trying to run TRS programs on other machines. The incompatibility persists with the newest work-alike Model 1, the Komtek.

One of the claims of the Komtek advertising is that everything is built-in ready for expansion. This claim is true to a point, and as long as one is not too ambitious! The printer interface is indeed inbuilt, but is limited to printing from BASIC where it performs quite satisfactorily. Printing from a machine language program (as most applications programs are) is another story. Either the program must be modified, or the optional (external) printer interface must be used.

The same people I've mentioned earlier regarding modifications for the System 80 (John Ross, 2B Green Road, Woodville 5011), and modifications to Scripsit to drive various printers (Ian Robertson, 22 Hilary Crescent, Modbury North 5092) can assist with the necessary modifications for the Komtek. In each case send return postage with full details of your requirement, to get an idea of the cost (\$5 - \$30) before sending your program.

Catalogue Programs

In reply to requests that I recommend a program to assist in bringing some degree of order to one's collection of programs, I must say I don't use one. I have heard very favourable comments about 'The Arranger' by Triple D Software (advertised in the American specialist magazine *80micro*). The brief demonstration I've had from one of its devotees confirmed this high opinion. My way of (semi?) organisation depends more on memory than a formal catalogue.

I have separate tapes and disks for system utilities, system games, BASIC utilities, BASIC games, scrap and current work, monitors, assembly and text, and Scripsit and text. While it has required a degree of self discipline for me to stick to this routine, I found that the hours and hours of work required to re-organise if I didn't do it quickly inspired me. Even my back-ups adhere to this plan.

Although I have two disk drives, I don't try to put everything on one booting system disk: I adhere to the above system. On the occasions when I've lost a disk I've been glad I did it this way! The booting system disk is write-protected, even though it's not full, and the data disk is in drive 1. Usually the back of the booting system disk is used for writing data as well, and when saving I write to each in turn. At the end of the session I then have a back-up almost automatically. This procedure of making back-ups while working avoids irreplaceable loss should something happen while using the DOS back-up facility only at the end of the session.

Back-ups Improved

Since my last lecture on back-ups it's been pointed out to me that the propensity for diskette stored data to be lost, and the subsequent creation of back-up procedures, is actually an improvement over previous practice. Seldom is a paperwork file backed up by photocopying the entire contents and housing it in a different place. So the need for back-ups is not in reality a liability of computer systems: it just highlights a failing in previous practices!

Where to Get It

Although the following may seem a free advertisement I (and YC) provide it as a service. I imagine many readers will be no less lazy than I in not bothering to send to America to get the cassette

'Load 80', which contains programs from *80micro*. There is now a distributor for these in Australia: Australian Computer Software, P.O. Box 450, Malvern 3144. This company claims to have all the recent issues in stock, available on 14 days delivery - and others are but six weeks away. At only \$20.95, including postage, it's good to see not all Australian software houses are profiteering.

Diskless Interface

Those with an expansion interface for their Model 1 but no disk drive can get back to the normal level 2 operation by removing the disk controller chip. It is a 40-pin IC with the number 1771. Put the tip of a screwdriver under it to enable you to remove it in a parallel motion from its socket; and store it in the protective foam or tubes ICs come in, so when needed it will be in a state to be simply plugged back in.

Having done this, you won't need to hold down the break key when switching on; and will be able to save many programs previously lost when Mem Size appeared at an inopportune time.

Monhi - Mon3

Many owners of Mon3 seem to have taken what is to me the obvious course of relocating it to E000H and calling it Monhi. The following comments therefore obviously apply to both.

In some of the early versions there was a bug that required a disassembly before using the W or F command to search for a given value. The early version had the down arrow replacing the enter key to send to the printer, whereas the later version used shift P. As far as I can determine, the bug was limited to the version with the down arrow.

So if you've been plagued with a lack of success with the F or W command, try a short disassembly and see if it helps. The other possibility is that you've got the bytes the wrong way around when using the W command - I must admit it is a source of confusion.

Visicalc With System 80s

In the early models of the Dick Smith expansion interface for the System 80 (the one with the S100 bus card), there was a minor wiring fault which prevented printing from Visicalc, Scripsit, and so on. The cure is a simple one: just send a 60 cent stamp to me at 36 Sturt Street, Adelaide 5000, for a copy of the Adelaide User Group's newsletter detailing it.

Mailing Diskettes

It would seem a natural precaution to put stiff cardboard on both sides of a diskette when mailing it. But this very precaution can cause grief. If the whole 'sandwich' is taped together too enthusiastically the black paper jacket is forced so tightly around the diskette that the edges will be too tight to allow the diskette to turn. The test is that if you can't turn the diskette within its jacket by putting fingers through the centre hole, the disk drive certainly won't be able to: you'll also be able to feel any undue friction which will mean the drive won't be able to rotate the diskette at the proper speed, so giving all sorts of errors.

The paper edges can sometimes be 'blunted' by wiping the diskette over a table-edge, but too often the damage cannot be corrected. A better precaution is, when you are mailing a diskette, to put some extra card strips on each side of it within the sandwich; so the pressure is borne by the strips, leaving the diskette free to move around in its little 'box'. □

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WELCOME ONCE again to the Texas Instruments column. I must say from the outset that the response to this column has certainly overwhelmed me. As our editor pointed out, it is nice to know the work you do is appreciated by the readers!

I have received so many letters since this column started in April I have had to make more time to answer them all. I would especially like to hear from fellow 'Ninety-Niners' in the country and other remote areas. I have sent off some demonstration cassettes to those readers and I am sure that they will enjoy them. Most readers highlight the unavailability of software and the lack of contact with other users as being the real concerns in those country areas.

The solution, I would suggest, is to get in contact with John Robinson, the hard-working Secretary of TISHUG (the Texas Instruments Home Computer Users' Group (Sydney)) and join this group. You may not be able to attend the monthly meetings in Darlinghurst but I'm sure a regional meeting could be organised – you'll never know unless you try. The address is PO Box 149, Pennant Hills 2120.

It will cost you \$30 initially to join, with an annual subscription thereafter of \$20. 'What do I get for my money?', I hear you ask. Well, most importantly, you will receive the club's newsletter, the *Sydney News Digest*, each month. The May issue (Vol. 3 No. 4) was the third birthday edition, and editor Shane Anderson has produced a highly professional 28-page publication which I believe would not look out of place on a newsagent's shelves. A full-colour cover reveals a depth of news, information, programs and advice inside that is unrivalled by many others. I won't go into details, but this is just a sample of the content: 'StarCorps', a space game; music programming with Russell Welham, who has written the theme from 'The Love Boat'; a review of PC 84: BASIC tutorial; and reviews of new software.

As a club member you would also be entitled to buy from the newly organised TISHUG Shop at special club discounts; you could get help with programming problems from the Programmers' Crisis Line; and also win prizes in regular software competitions. There is even a section for younger computer 'phreaks', known as the Jenny column.

Full-Day Workshops

One of the real highlights of TISHUG membership is attending the regular full-day workshops. Two of these workshops have been held this year and both were outstanding successes, with over 200 people attending each. Classes are conducted by the 'experts' in all facets of computing-BASIC, graphics, music, word processing and advanced programming. As always, printed material was made available to each participant in the form of worksheets and study notes. Much of this material is culled from overseas sources and would otherwise not come to the attention of many 99/4A users.

At the well-organised June workshop each participant received specially prepared study guides covering 32 pages of material on all aspects of using the TI 99/4A. Classes were held before lunch and repeated after lunch so everyone could get to at least two full sessions.

News from Imagic

Besides the rumours currently doing the rounds in the USA that Texas Instruments is contemplating a re-entry into the fiercely competitive home computer market, there has been some positive action here in Australia. Imagic, the software distributor and maker of such great classics as 'Demon Attack', has announced it has taken over the distribution of Texas Instruments' hardware and software here in Sydney. I spoke to Don Dennis, Director of Imagic Australasia, who assured me Imagic would soon have supplies of all the now hard-to-get TI equipment.

The release sent out to publicise this announcement quotes Managing Director Chris Milner as saying that Imagic "will have the entire software range for Texas Instruments available, and will be supporting the system over the next three years." That, I am sure you would agree, is certainly good news!

Some of the software to be released includes Super Demon Attack, Microsurgeon, Fathom and Dragon Fire. Imagic has kindly sent me some of these games for review and you can look forward to reading about them in a forthcoming column.

If you want to get in contact with Imagic and be placed on its mailing list for news and software updates, you can ring the Software Advisory Service on (02) 981-2744, or write to them at PO

Box 234, Dee Why 2099.

TISHUG Bulletin Board

The day of the TISHUG Bulletin Board Service (TIBBS) becoming fully operational is drawing closer (if it hasn't already started by the time you read this!). Shane Anderson has already taken delivery of the necessary hardware – Foundation's 128K RAM card, three diskette drives and auto-answer modem – and the software is almost finished.

Although details have not yet been finalised, Shane hopes to be able to have TIBBS on-line at least twice a week for uploading and downloading of club software and news. I will be passing on more information as it comes to hand, but in the meantime save those dollars and cents for your RS232 and modem because TIBBS heralds major changes in the use of your 99/4A and will revolutionise the way you receive software.

Software Reviews

Some local releases include two new games, Freaway and Froggoids, both written in Extended BASIC and available on cassette tape. Thank you to Computerwave for the review copies.

Froggoids: Subtitled 'Frogs in Space', this game was written by Mick Hill and it re-establishes a now well-worn Frogger-type game strategy. On running the program the player is greeted with a randomly generated sprite display which gives way to the theme 'In space no-one can hear you croak!' The game screen sets itself up quickly. You are a frog caught in deep space and your task is to hop home through the 'Black Hole', which is actually a horizontally moving red square. You will need a joystick to hop past three rows of menacing asteroids and then hitch a ride on passing spacecraft before hitting home.

I found it easy enough to play, and the game does have interesting sound effects and well-drawn characters, but my copy skipped Level 3, and the higher levels turned out to be the same as the earliest ones. If you have played Frogger you know what to expect. Froggoids is available on cassette for \$15 from Computerwave, 325 George St, Sydney. Phone (02) 290 2020.

Freaway: This is also in Extended BASIC and again uses a familiar theme. You are a chicken who must safely cross a busy freeway and railway line.

Keyboard control offers a quick response to your movements, but I was able to cross the screen a number of times simply by pressing the 'up-arrow' key and letting the chicken go.

The instructions at the start of the game gave the wrong keys to play with and there is no allowance for sideways movement; it's so easy I suppose you don't need it to get your chickens home to roost!

When you have finished the game (losing ten chickens), a display screen gives you information on your score, the current high score, number of chickens safely home and the level you reached. This game also comes with the option of a two-player game, which must be loaded separately.

Freaway is available from Computerwave for \$15.

Plato

Many 99/4A owners would have bought their computers mainly for educational purposes for their children and it is upsetting to learn that Control Data, the distributors of Plato Courseware, have declined to import this series for the 99/4A. They only supply the Apple software at present.

I was fortunate enough to have had a preview of the Plato Interpreter Cartridge and several maths, humanities and English reading courseware disks from Texas Instruments late last year (just before the decision to close down the home computer section), and not only was I impressed but several colleagues also passed favourable comments.

I believe that given the availability of further TI peripherals in the near future, Plato is a viable proposition. If you feel the same, write me a short note outlining your feelings and together we might be able to put some pressure on Control Data to release the whole catalogue of Plato courseware.

Useful Tips

Tip No.1: When using the joystick option on the 99/4A, make sure the Alpha Lock key is in the up position. I have heard of too many occasions where people have returned their joysticks thinking them faulty.

Tip No.2: When using data loaded on cassette you must have the remote plug connected to your tape recorder, so the computer can automatically switch the recorder on and off as it reads the data.

This applies particularly over a lengthy period of time as the computer loads the cassette and draws the screen alternately. If you don't have a compatible cassette recorder, you will need a remote plug adaptor. If you need one write to me.

Tip No.3: When using diskettes, make use of the other side by clipping out a write-protect notch opposite the original with a single-hole punch that can be purchased at any department store for about \$1. Be sure to make the notch big enough or you will incur an error when attempting to initialise the disk. You will also need to make a hole opposite the original, near the centre of the disk on both sides. To do this, attach a felt pad to the under-lip of the hole punch and carefully slip it into the disk jacket. Make a clean punch and repeat on other side. If you feel hesitant, perhaps you could practise on an old disk first. I have successfully flipped over 60 disks without loss!

Colour Mixer

```
100 REM COLOUR MIXER
110 REM BY G. COOKE
120 FOR C=2 TO 12
130 CALL COLOR(C,13,1)
140 NEXT C
150 CALL SCREEN(12)
160 CALL CLEAR
170 INPUT "FIRST COLOR?":COL1
180 IF COL1>16 THEN 160
190 CALL CLEAR
200 INPUT "TO BE MIXED WITH?":COL2
210 IF COL2>16 THEN 190
220 CALL CLEAR
230 CALL COLOR(13,COL1,COL2)
240 CALL CHAR(128,"AA55AA55AA55AA55")
260 CALL HCHAR(1,1,128,736)
270 GOTO 170
```

Short Program

Here is a short demonstration program by Graham Cooke, which mixes two of the available 16 colours from the 99/4A. You choose the colours you wish to mix in lines 170 and 200.

Penrith Meetings

If you live in the Penrith area you might like to get in contact with Malcolm Tudor on (047) 333 673, after 6 pm on weekdays, and join his regular group meet-

ings held once a month on a Monday evening.

Program Explanation

Lines 100-110: Credits.

Lines 120-160: Establish colour sets to be mixed, display screen colour light-yellow and clear the screen.

Lines 170-220: Choose two colours to be mixed and clear screen.

Lines 230-260: Establish colour pattern, assign a random ASCII character, and fill the screen with the mixed colour.

Line 270: Start again. To end program press FCTN 4.

XB-Chess Review

This is a local program, written in extended BASIC, which would appeal to all chess players. The author Andrew Nutting has spent a considerable amount of time on perfecting his game to the point where it is also playable over a modem.

After loading the tape, players are offered the choice of modem play or 'board-only' play. The default choice is 'board-only' between two players. A further choice allows keyboard or joystick control over the chess pieces.

An imaginative sprite display of multi-coloured chess pieces introduces the players to the game proper. Traditional black and white men are presented on a green and yellow tiled board. Opponents use a movable square to effect their play. This square is positioned over the chess piece you wish to bring into play; pressing 'Enter' picks it up and places it to the side of the board until you have relocated it. Pressing 'Enter' again puts it down in its new position. Now it is your opponent's turn.

All the moves you come to expect in chess are available and it is indeed a satisfying implementation of the game for 99/4A users. My only quibble, and it is a minor one, is that you cannot play the computer. However, this game offers exceptional value for money. XB-Chess is available on cassette from Computerwave, Sydney, for \$15.

That's all for this month - my typewriter has given up the ghost and my eyes are at half-mast. Look forward to a special book review column coming soon and hopefully a game feature on new cartridge software. I also look forward to hearing from you on any subject you care to discuss - if I can't answer your question, I know someone who can. □

THIS month we'll have a look at getting numbers formatted nicely, at some graphics routines in Applesoft, and at an overview of the computers Apple is now selling.

Unfortunately Applesoft has no built-in provision for formatting numbers. This means when you wish to print columns of numbers with decimal points down the screen or to a printer, the decimal points won't come out all nice and straight down the page. Another problem is that the number of figures after the decimal point appears exactly as entered; it would be much more convenient to specify the number of decimal places after the point and have the computer round off the number if it is longer, and add zeros if it is short.

To offset the problem of no number formatting, Applesoft does offer extensive string handling commands. The ones we will need are:

STR\$ - which converts what is inside its brackets (called its argument), usually a number, into a string of characters; for example, the number 21 becomes a string of the character '2' followed by the character '1'.

RIGHT\$ - which returns the right half of another string, the length of which you specify.

LEN - which returns the length of a string as a number.

First, let us consider the case where we want two decimal places after the decimal point - the most useful application, as it is used when typing in dollars and cents.

We will break the number into two parts: the part on the left side of the decimal point, and the fraction. The integer component can be found with:

$INTEGER\ PART = INT(N + .005)$
where N is the number we're translating. The .005 does the proper rounding off.

The fraction component is found by shifting the whole number across two places to the left, and then using the same procedure as above. The formula above will only give a single zero after the decimal place, but this is overcome by adding a dummy 100 as shown below (which makes no difference to the fraction, but means the number will have its two zeros after the decimal place).

$FRACTION = RIGHT$(STR$(INT((N + 100) * 100 + .05)), 2)$

Notice how the RIGHT\$ with a value of 2 ensures two, and only two, figures after the decimal point.

Putting this together we get:
 $N\$ = STR$(INT(N + .005)) + "." + RIGHT$(STR$(INT((N + 100) * 100 + .5)), 2)$

where N\$ is a string of the number N, rounded off to two decimal places, with at least two figures in the decimal part.

To account for negative numbers all we need to do is add a minus sign to the front or back of the string, using Applesoft's simple string adding - that is, $N\$ = "-" + N\$$ for N negative.

If we want to have all the decimal points lined up under each other, the standard method is:

$HTAB(WIDTH - LEN(N\$))$
where WIDTH is a variable indicating how far across you wish the number to be printed.

For a printer you would use:
 $PRINT TAB(WIDTH - LEN(N\$)); N\$$

Generalising this formula to allow you to specify any number of decimal places, we have a subroutine:

```
60000 IF N < 0 THEN N = ABS(N)
      : GOSUB 60010
      : N$ = "-" + N$
      : RETURN
60010 N$ = STR$(INT(N + 1/10
      ↑ DP))
      + "." + RIGHT$(STR$(INT((N
      + 10 ↑ DP) * 10 ↑ DP + .5)), DP)
      : RETURN
```

To call the subroutine DP, an integer variable must be set to the number of places required; then N should be assigned; and a GOSUB 60000 made. This routine should work with up to five decimal places, and with numbers up to 9,999,999.

Graphics in Applesoft

This isn't about standard Applesoft graphics, but about the graphics commands written in machine language embedded in the Applesoft ROMs. These commands aren't well-known and would usually be used by a machine language programmer who doesn't want to rewrite routines already present in the machine.

The most commonly used commands are the POKEs for page flipping, which control what you see. The handiest is POKE-16302,0, which displays the full graphic screen instead of four lines of text at the bottom. The text can be retrieved with POKE -16301,0.

Other commands are:
POKE -16304,0 - which switches to graphics without clearing to black.

POKE -16297,0 - which selects higher rather than low-res display.

POKE -16299,0 - which selects a second page.

These commands can be used to save a high-res page to keep your 'high score', if the program has no such provision. Simply hit 'reset' while your score is displayed on the screen; if your Apple re-boots you can insert a normal disk; if it doesn't re-boot this method won't work. To see if the screen is still intact which it should be as re-booting does not affect the high-res screen, type POKE - 16297,0. If you see your 'high score', go back to the text screen by typing TEXT (which you should be able to do blindfolded) and save it with

$BSAVE\ HI\ SCORE, A\$2000, L\2000

If you don't see your score the first time, try typing POKE -16299,0 while still looking at the first page: you should now be able to see your score, and the second page may be saved by the command $BSAVE\ HI\ SCORE, A\$4000, L\2000 . If you have text at the bottom of the picture, this can be changed by typing POKE-16302,0.

More on display switches can be found in the Applesoft reference manual (pages 131-134) and the Apple II reference manual.

CALL 62454 is another useful command, which will fill the screen with the last plotted colour; for example

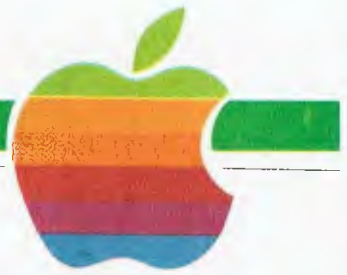
$HGR : HCOLOR = 6 : H PLOT 0,0 : CALL 62454$

The Apple II Family

Set out below is a brief description of all the currently available Apple microcomputers - in case you'd like to update.

The Apple IIe is the original hacker's computer, with eight slots provided for add-on boards. If something has been done with a personal computer it was probably done with a II, II+ or the IIe - a stripped down II has even been on a spaceshuttle mission. Add-on cards range from the disk drive controller card which everyone has, through to 80-column cards, speech synthesisers, music synthesisers, 256K memory cards, 68000 processor boards, and so on.

The IIe is aimed primarily at home users and those interested in finding out more about personal computers. A system with a proper monitor, two disk drives (Apple's Duodisk), and an extended 80-column card (another 64K), has a price tag of around \$2595.



The Apple IIc is aimed at people who need a computer to work with, but don't want to worry about what's under the hood. Of course it's also for those who need a fully portable computer, which it will be when the 24- by 80-column flat LCD display is available later this year. The IIc's direct competitor is said to be the PCjr, but it would seem more comparable with the new IBM portable, since the junior has been so badly panned by critics. The price of the IIc, with built-in drive and 128K, is \$1775.

The Apple III+ is Apple's standard business computer, much like the hundred or so other business computers around at the moment. An underrated machine, the revamped III is designed for serious business use. The price of a 256K III+, with Apple's monitor and Professional Solutions pack, is \$4448.

The Macintosh is Apple's biggest success since the original Apple II: 72,000 Macs were sold in the first 100 days after its release, compared with the

ten months it took IBM to sell the same number of PCs. The Macintosh has even been successful in the American college market, and our Wollongong University has also installed 30 Macs.

Mac's largest market is with first-time business users, or business people who have tried computing and found it wasn't as easy as Mr Chaplin makes it look on television. These people want ease of use and a fast, powerful machine. It seems Apple has succeeded in this market, since it has announced plans to double the current output of the Mac (which is about 40,000 a month). The standard Mac, with MacWrite and MacPaint, has a price of \$3445; and an ImageWriter printer can be added for \$750.

Lisa is Mac's big sister. There are three versions of Lisa available, based on what type of storage is used; the machine operates with either floppy disks, as used in the Mac, or with a five- or ten-megabyte hard disk. Lisa is now

sold without the software it originally came with, but those packages are still available. Intended for executives whose time is valuable, and for managers in medium to large organisations, the Lisa, with Mac's operating system, 512K and floppy disk drives, has a price of \$4995; and goes up to \$7695 with a ten-megabyte hard disk.

All the abovementioned prices are recommended retail prices, as given by Apple at the Data '84 exhibition in June this year.

Although this column will continue to refer mainly to the II family, I hope to cover some aspects of Mac (and maybe even review some of the software coming out for it) - provided I can get my hands on one. If you have any questions, feel free to send them to me via the magazine; if I don't know the answer I can always find somebody who does. (For a prompt reply please enclose a stamped, self-addressed envelope. □)

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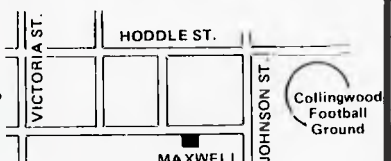
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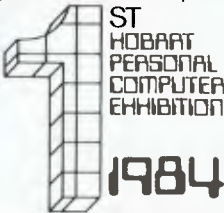
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