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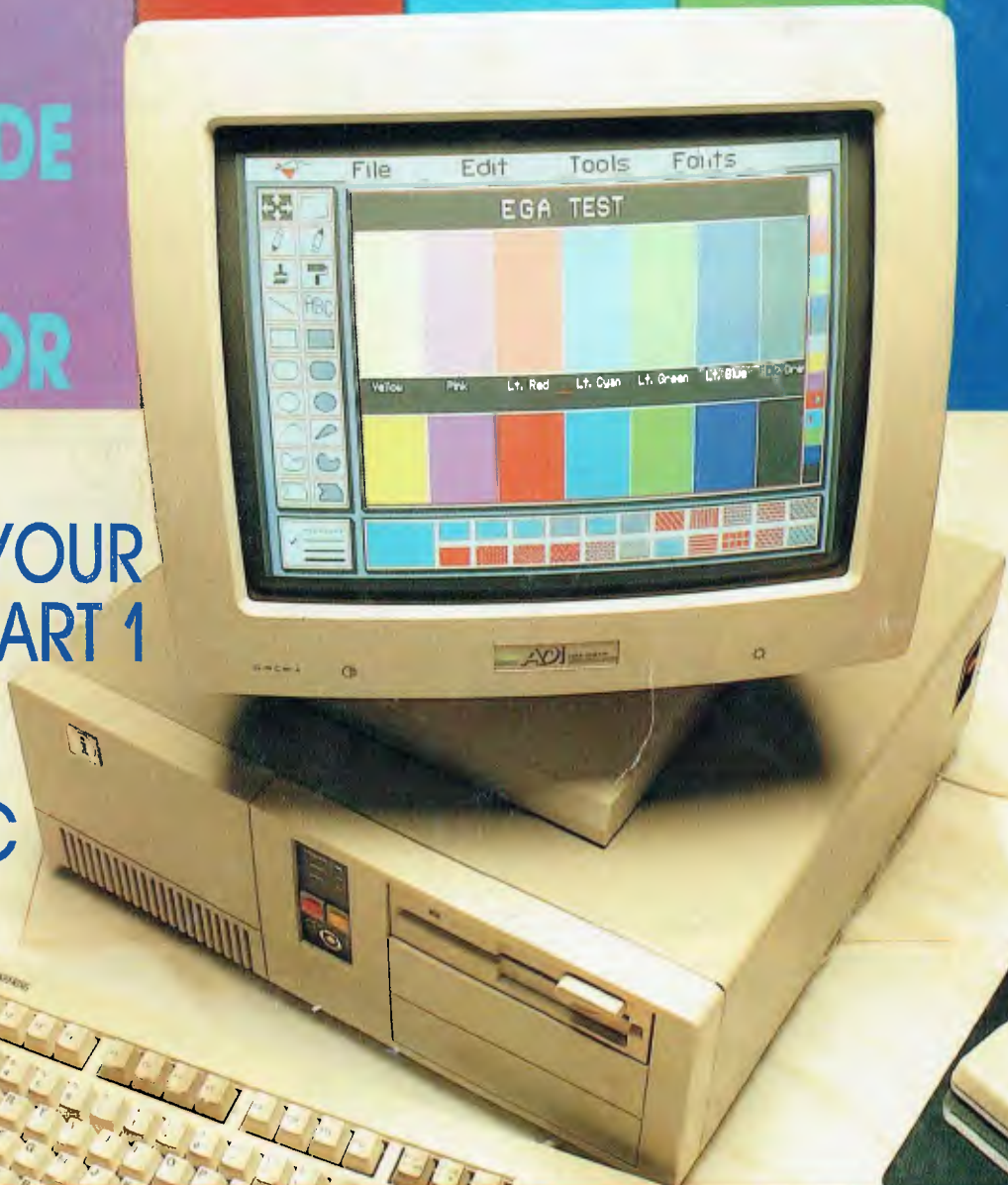
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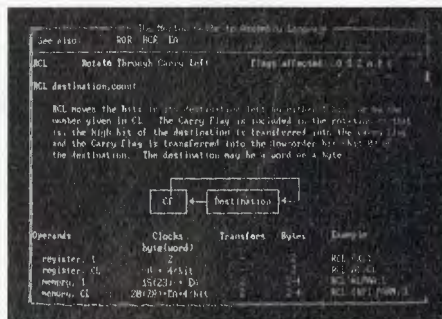
C: • Language description: including programming statement operators, data types and structures. • Library functions: library and built in, from write to abort • Preprocessor Directives: commands, usage and syntax • Tables: ASCII, line drawing, keyboard scan codes, error codes, character constants, header files, coercion rules, operator precedence, and more!

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• Tutorial: OS/2 concepts • Conversion Guide: DOS-to-OS/2, how to use pipes, queues, semaphores, etc. • Basic Reference Data: ASCII codes, error and return codes, special keystroke codes, ANSI escape sequences and IOCTL functions.



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Security

The reliability of hardware can easily lull you into a false sense of security. But – the worst possible scenario should see you loosing data only one day old (*right?*).

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NEXT MONTH INCLUDES . . .

Now that we've all been convinced to buy PCs, the latest buzz word is 'connectivity' – and that's what our October issue is all about: local area networks (and suiting them to your needs), communications software, modems (and communications jargon), on-line services, a complete listing of Public Access Message Systems, some sneaky input and output techniques, and everything you need to know about connectors. (In case you still need help working it all out, there'll be a complete listing of Australian User Groups covering almost every brand of computer). Other inclusions – that taste of artificial intelligence we promised for this issue, computer generated poetry, Windows 2.03 and a look at ADA and the software crisis.



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CM113 Writer's Tool — Helps you to write so others can understand. This program will analyze your writing and determine its readability.

CM116 Disk Editor — Very handy for editing any part of any disk file using a handy windowed hex or ASCII dump of the file onto the screen.

CM117 Stock Trend — Helps you to analyze stock trends. Easy to use menu driven system.

CM118 Xanadu — A collection of very useful programs. Quickcrt speeds up your screen to turbo mode. Sort your directory, displaying different colour based on file extension. PCSTAT displays disk/ram statistics. Sfind finds files fast.

CM119 Basic Games — Various games in basic including Aardvark/Bowling/Keno/Spacewar and many more.

CM120 Desktop Publisher — Publishing programs for newsletters or simple applications.

CM121 Lotto Luck — Helps you pick Lotto numbers.

CM122 Bookkeeper — A complete financial tool for business and personal use where complex accounting software is not needed.

CM123 Poker Anyone? — Lets you play five-card poker against the computer.

CM124 Duke Language Toolkit — For creating foreign language fonts for the EGA. It is a great tool for creating alternative ordinary screen fonts.

CM125 Record Collector — You can catalogue and find songs by title, artist, label, producer or any of 19 other traits.

to respond within 10 days, and receive an unwanted selection, you may return it at our expense. As a member you need buy only 4 programs at regular low Club prices during the coming year. You may resign any time thereafter or continue to enjoy club benefits as long as you wish. Both selections will cost \$10.00 each. The Club offers more than 800 public domain and shareware to choose from. A shipping and handling charge of \$3.00 is added to all shipments.

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Backing up . . .

LET'S TALK about one of the most boring subjects in microcomputing. One you'll want to avoid. One you'll try to get away from, perhaps, by not even reading the rest of this page. But the major reason you'll try to skip it is guilt. Yes, I'm talking about backups. You want to skip to the next page already, right? That's only because you don't want us to remind you about what you know you should have done, but haven't!

About five per cent of you will be regularly carrying out effective backup procedures. Around another 25 per cent of you think you are. A few more 'have a stab at it' every now and then, and the rest have complete faith in the total reliability of the micro and the perfectness of the universe. For them I have this nice, one-owner grey bridge . . .

I'm pointing the finger at all of us – myself as well as you. For example, I've often been in the latter category and, because I'm great at disaster recovery (I've been likened to a bespectacled little old lady, sitting for hours picking data off a broken hard disk and 'knitting' it back together again), I have survived.

I've even been known to be cocky about it. 'I'll always survive', I tell myself and anyone who questions me.

Well, let me tell you a couple of interesting stories of backup procedures that went wrong – close enough to home to wipe any hint of cockiness clean away. Think about what would happen to you, or your company, if you faced the same situation.

The most dramatic example was the fire at Federal Publishing, the home of *Your Computer*. No one ever expected the place to burn down, did they? We only gave advice about fireproof safes and off-site backups, we didn't take it . . .

The place did burn down. One wing of the Federal building was gutted by fire. The magazine's office was not a total write-off – at the end of the wing, it was shielded from the full effects. Shielded by the computer room . . .

All the YC computers melted. Ugly, tiny blobs of molten plastic and warped metal. Gone, right down to the last byte of data. We had backups, of course, but let's not debate how current they were – you'll never prove they weren't right up to the minute, because they were in the computer room, too!

Even the bulletin board was backed up, daily, onto tape. Guess where the tapes were?

Only our software masters were in the fireproof safe, yet software masters are much more easily replaced by insurance money than lost data.

The only reason it wasn't total disaster was the fact the magazine was in the middle of changing over from those machines to new systems. Had it happened six months earlier, we'd be in tears. Had it happened a few years earlier, when the

company's accounting was also on those multi-user systems, it could have cost hundreds of thousands of dollars . . .

Many companies would go to the wall if their data was wiped out; think about what it would do to yours. Even if the result wasn't that dramatic, think about the extra blood, sweat and tears you'd have to go through to get things back to normal.

Don't tell me your office isn't ever going to burn down – neither was ours . . .

Another company I'm associated with has had some interesting backup experiences recently. The first was when they got a chance to test their long-standing and reasonably diligent backup procedures after a hard-disk crash.

They got out the backup tape, re-loaded the (new) drive, and *voila!* Nothing.

It turned out to be a false alarm, a peculiarity in the tape software – but it was so peculiar they and their dealer's technical people had given the data up as lost. They were preparing to hire a roomful of casual staff to re-key a year's data when I found the 'hidden' files for them.

The same office recently sent me four of their backup tapes to find out why they couldn't read them. They must have done it with their eyes closed because as soon as I opened them, I noticed the neat break in the tape (and the not-so-neat mangling of the tape on the spool). A bad drive was munching their tapes, and they kept feeding it!

There are some important lessons to be learned here. We can't go into a full breakdown of backup procedures, but here are a few of the most important points –

- 1) Maintain several, rotating, backup sets. And regularly archive a complete backup rather than re-using the same sets of disks: that solves the too-common situation of writing bad backup data over good.
- 2) Regularly test your backups are working by doing a restore – but do it to a separate drive or directory, or even another machine, rather than over your good data. Finding out your backup procedure doesn't work after a disaster is more foolish than never doing a backup.
- 3) Keep at least one, preferably two, off-site backups.
- 4) When something goes wrong, sit on your hands. Take time to think of the appropriate solution, rather than rushing in and making the problem worse. If you're not sure what you're doing, then don't do it.
- 5) Don't ever feed more than one backup to a machine which doesn't seem to be accepting it – that could indicate a physical problem (like a bad tape drive or floppy) which will eventually destroy them all.

YOUR COMPUTER

You'll just have to wait!

YOU'RE holding quite an accomplishment in your hands: this was the issue of *Your Computer* that really tested our mettle. That fire we had at the end of June (when we were just finishing the August issue), left us with exactly nothing to start this one. No computers for word processing (and what else do we do here?), no phones or fax, no printer for diagrams and tables, no articles and no modem or bulletin board to receive them on, no photographs (and our studio and darkroom went up in smoke, too). ... nothing. So putting this issue together *on time* became a tale of travail.

I'm amazed!

I am always amazed at how calm and organized the articles look in the magazine when it's published. Of course, I've followed them from inception to publication and am aware of the 'story' behind every article, like the Tandon review on page 57. The concept of a portable hard disk is a good one; when an entire system is built around that idea by a company with a long-established reputation for excellent drives, it's well-worth asking for a review machine so we can tell you about it.

(The story I'd heard of the Tandon Pac's launch, when, to demonstrate the strength of the Data Pacs, a leading light of the company deliberately dropped one to the floor, where the case promptly shattered in front of the assembled press and other interested observers, only added a bit of flavour to the idea – the Pac was till usable, only pride and the case suffered, I understand.)

So – it came to be that a Tandon Pac 286 was sitting in my office when the whole kit and caboodle went up in smoke. Telling that to the gentleman from Barsons who had kindly lent us one of the few machines in the country, was only one of many unpleasant phone calls I had to make in the days after the fire. Since we particularly wanted that review to appear as part of our security feature in this issue, I had to then ask for a second machine.

I had intended to write the review my-

self, but by the time the machine arrived, I had become too involved with other things to have the time and had to find someone quickly who could do the computer (and our readers) justice). Bear in mind that almost all of our reviewers have full time careers of their own and are experienced enthusiasts, rather than professional computer journalists (most reviews written by professionals lack a 'real' user's perspective, I feel).

This means that finding someone *reliable* on short notice can be a worry. So, I turned to Ewart Stronach just as he and his son Gregor were preparing to head for Expo for a week – 'never mind, there'll still be time when you get back.' Except a bureaucratic bungle delayed delivery, which left Ewart one weekend to review it.

The tale of the Tandon doesn't end there. We had the unit and the review (thanks Ewart!) couriered into the office on Monday morning (the deadline was the following Friday and we still needed to take pictures and do all the other production work). I took all six boxes worth of Tandon straight into the empty office we're using for a studio and set it up, only to discover that we couldn't photograph anything on the screen because the room couldn't be darkened enough. Never mind, we did the screen shot separately with a snood over the monitor (it was then dropped into the overall shot at press).

All that done, I had just sat down with a nice cup of tea, ready to do something interesting, like read press releases, when a foolish-faced photographer stuck his head around the corner: 'Sorry, but I was interrupted when we were setting up and there was no film in the camera...'

And all that for two and a half pages! Imagine what it's like putting a hundred or more together each month. As I said, I'm always amazed at how calm and organized it all looks in the magazine.

My mention of our reviewers above, reminded me of a point a reader raised a while back: he commented that few of our reviews were unfavourable and that in

most instances, the author recommended buying the product. That's because many of the reviews in YC were written by someone who's discovered the product on their own, used it extensively for several months and become enthusiastic enough about it to want to tell others. Articles like that have 'perspective' in what they have to say – I see little point to 'reviews' that were obviously written from hyperbolic press releases, the manual and four hour's experience. (My asking to have the Tandon reviewed so soon after its release was an exception in that it is an innovative machine and offers a new approach to data security: we were previewing the concept as much as reviewing the system.)

One result of our fire is that we are experiencing what it's like to actually choose and buy hardware and software ourselves. While we started ahead of many would-be buyers in that we knew exactly what we wanted and what we wanted to do with it, we were disadvantaged by the fact we needed everything *now!*

That led us to experience almost every frustration and irritation we'd ever heard about when shopping for computer products, and experience it in a very short time. The 'frustration' that's become a classic is: 'We don't have any stock right now, because there's a new version due real soon now.'

And, one of the irritations: a company that really only sells one product, took ten days to deliver because of a 'supply shortage', and then we received demonstration copies of the software (not that there's anything necessarily wrong with demo copies, it's just a bit shabby: when you buy something, it's nice not to have DEMO NOT FOR RESALE stamped all over the manuals and menus).

'Well, then,' says the sales person, 'you'll just have to wait' – *that* attitude seems to sum up much of the industry's view of users. Now that we've been convinced that computers *are* a necessity (and the industry has been trying to do that ever since the days of *Interface Age*), don't expect service, advice or help. You'll just have to wait. □

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AMERICAN GRAFFITI

Literally every day that I sit down in front of my computer I think about safety and integrity, particularly, for my data. A recent arrival here at the Fantasy Factory got me thinking about these issues in somewhat more detail.

The item in question was a 'white paper' describing viruses, Trojan Horses, and other potential hazards for data. A cover letter to editors (of which I am one) announcing the white paper notes that interested users can obtain the paper by requesting it on company letterhead. The paper comes – surprise, surprise – from a company peddling a PC security-related product.

Like virtually all freebies, the paper presents just enough misinformation, and the right buzzwords, to scare the hell out of readers and make them rush out to buy the product. That overlooks some very basic elements of security and data integrity. For example, dogs of all sizes and three-year-olds dripping peanut butter and jelly, ice cream, and other childhood substances are the two greatest threats to data yet invented.

It's distressing that nearly a decade into the microcomputer age – and three decades into the information age – information integrity remains such an opaque subject. Herewith, some brief tales from the front –

□ An employee of an information-oriented company recently asked me to transmit something to her via a third-party electronic mailbox her company had rented. I was astounded when she blithely gave me her password; I was even more astounded when, a week later, it had not been changed! She seemed unaware that she had just given me the figurative keys to her company's vault!

□ My friend Roy lost some data some years ago on a New York subway. I don't mean he lost a tape or a disk. He was carrying some tapes to another installation to do some testing, and put the tapes down next to a powerful electric motor or generator. When he arrived at his destination, the tapes were scrambled. Only later did he realise what he'd done!

□ One of this country's largest-circulation business magazines (though, obviously, not the savviest or most incisive) was being helpful to its readers, most of whom would appear to be technological semi-literates. One of its recommendations re-

garding terminals and computer accounts was to vigorously enforce the use of passwords. One helpful hint: a password should be 'something easy to remember'.

□ By contrast, my hapless friend Mort, a systems programmer, once upon a time created a password that was so unique that he forgot it! It took two mumbling, shy, seedy-looking individuals – members of the vendor's crack 'Code Blue' squad – two hours to recover it.

It's distressing that nearly a decade into the microcomputer age – and three decades into the information age – information integrity remains such an opaque subject.

□ I myself, some years ago, managed to wipe out some critical data for a large New York bank. At that time, IBM tape drives contained a design error that allowed you to 'fool' them into writing on a tape that was supposedly protected. Theoretically, you could write on a tape only if you had first inserted a blue plastic 'write protect ring'. (Accurate name, huh? A more accurate term would have been 'write DESTRUCT ring!') In fact, by pressing some buttons and interlock switches in the right order you could bypass that requirement. We used that knowledge to save a few seconds – and also to scare the hell out of operators who were not familiar with that little trick.

After an arduous, boring all nighter in the data center, I was triumphantly approaching the end of a delicate testing session. Stressed out and in the home stretch, I forgot that I'd used the trick – and managed to destroy a master file! There was a backup, of course, stored conveniently off-site, under a mountain patrolled by guards trained to shoot first and ask questions later.

Fortunately, I knew that the shift operator had his own low opinion of some of the bank's sometimes cumbersome backup-and-security procedures (installed, of course, by overpaid outside consultants) – and that he maintained his own 'private stock' of critical backups in an out-of-the-way place, to deal with situations such as this. The promise of a few after-shift fermented beverages was more than sufficient to pry the proper tape loose – with no one the wiser.

Realistically, the major source of threat to your information is the 'human factor' – doing dumb things, like getting lazy about backing up your hard disk, or slipping into the habit of automatically replying 'yes' every time you see the message 'Do you *really* want to delete this file?'

Nor am I particularly worried about someone stealing my disks and learning my own secrets. I do have some data that I regard as sensitive, and that I would not like to see others get their hands on. However, the file name for that data is innocuous – it has meaning only to me – and the external label on the disk is similarly innocuous. The odds are that if someone broke into the Fantasy Factory and stole my disks, they'd have to look through several hundred files before coming on the good stuff. By that time, though, there's a likelihood, I think, that reading all the other, irrelevant stuff on my disks would have turned the malefactors into zombies.

All this theoretical stuff about data protection notwithstanding, three simple steps will go a long way towards keeping all your data safe. First, don't even turn your computer on unless you own a utility that can recover data caused by accidental erases, bad pointers, and so on. Several good ones can be had for under \$100, and that investment will repay itself the first time you use the package.

Second, remember this about programs of unknown provenance (like freeware): with a few modest precautions (like reboot after running), they can always be run on a floppy-only system without risk, but they can *never* be run totally risk-free on a system with a hard disk.

Finally, remember: practise safe computing. Always insist that your disks wear a write-protect tab. Without it, you don't know what kind of diseases you could get – or give. □

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Absolute Positioning

Other devices require physical gymnastics to locate your cursor! The position of the Felix handle is exactly related to the cursor position on the screen.

System Requirements

- IBM PC/XT/AT, PS/2 or 100% compatible
 - 25K RAM
 - DOS version 3.1 or above
- One standard RS-232 serial port configured as COM 1 or COM 2

Compatibility

- Lotus 1-2-3™
- WordPerfect™
- MultiMate®
- Wordstar®
- Microsoft® Bus Mouse compatible (absolute mode)
- Microsoft® Windows™
 - Microsoft® Excel
 - Microsoft® Works
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CANBERRA COMMENT

Aussie supercomputers

Australia needs to speed up its investment in supercomputer research and development, according to the Minister for Science, Barry Jones. In a report released by the minister, supercomputers are seen as a vital step in Australia's growth. The report says that there are about 260 supercomputers around the world, with 78 of these in Europe. Australia has a few super units, some under-used.

In Canberra, Csironet has a Cyber 205, the Australian National University has a Fujitsu VP50 (currently being updated) and the Defence Department has a Cray. In Melbourne, Leading Edge Technologies has a centre for Cray users.

The report criticises Csironet's Cyber 205 system: to begin with, Csironet has not been able to interest many customers in the Cyber 205. Those who have used the system, complain of poor system support.

Csironet has real problems staffing Cyber with trained specialists. The Cyber system has about five support specialists, compared with 34 for a Cyber system running at the University of Manchester in England.

Supercomputers are expensive, averaging about 20 million dollars a piece. However, their data processing speeds are like comparing a jet fighter with the Red Baron's Fokker.

The report stresses three options for supercomputers. One is for a federal government funded facility to encourage use of supercomputers. A second is direct help for industries wanting to invest in supercomputers. The last choice is to leave supercomputer development in private hands with no government assistance. Given the expense of supercomputers, the minister believes that the government must ensure the technology is available to Australian industry. The report also discovered a growing interest in supercomputers among Australian universities and businesses.

Government productivity awards

National, state and local government computer productivity awards were combined with a technology exhibition in Canberra recently. Awards were presented to over 30 local, state and federal government departments.

The Bureau of Meteorology carried off a gold award for an updated computer forecasting system. The equipment, supplied by Tandem Nonstop, speeds up data retrieval and collation. Weather forecasting is now more accurate and faster for industries such as airlines, which depend on up to the minute weather reports.

The Australian Customs service also won a gold award for a new Electronic Funds Transfer System. This system will ultimately be able to electronically transfer up to 14 billion dollars in customs duty each year. The National Capital Development Commission of the ACT won the silver award for local government computer technology. The NCDC has a system called Geodis, with the ability to control all land plans in the ACT.

NCDC manager, Peter Leonard, said Geodis was the only system of its kind in Australia. The system integrates all land information, including spatial, textual, topographic and cadastral, on every land parcel in the ACT. Geodis can also generate complex topographical plans.

*In a report released by
the minister,
supercomputers are seen
as a vital step in
Australia's prosperity.*

The local government gold award went to the Brisbane City Council for a computerised records management system. Murray Stewart, the officer in charge of the City Council Central Records branch, and Neil McPherson, the deputy town clerk, introduced the new system. It is accessed through 90 terminals, providing an improved flow of documents to all council services.

Two state government computer projects won gold awards. The West Australian Parliament House Hansard department has developed a new desktop publishing system to cut production costs. Morris Davids, the computer systems manager for the parliament, in conjunction with Convergent Technologies, has success-

fully combined all the standalone computers into one streamlined network.

The speed of the program lies in its Macros and Phrases. Macros are command strings while Phrases are text and format instructions. These Phrases are now operated with a simple keystroke and Macros operate automatically. The Convergent system uses two mini computers and 50 terminals.

The NSW State Police Department picked up a gold award for its computerised fingerprint system. The fingerprint database speeds up fingerprint identification, as well as sorting through fingerprint clues on crimes committed years before.

Telecom network for the 1990's

Telecom recently announced a new high speed data, voice and image link for service in the 1990s. The new link is under development by QPSX Communications in Perth. Telecom owns 60 per cent of PSX and has put 11 million dollars into research and development of the high speed telecommunication link.

QPSX (Queued Packet and Synchronous Switching) has potential export earning of around 50 million dollars, according to Telecom. QPSX has already been accepted in North America, the first time, it's claimed, that an overseas company has cracked the US networking market.

The real advantage with QPSX is in managing digital data with a method called distributing processing. This gives users almost instant access to the network.

QPSX is also very reliable because it does not use a single central switching operation. These are distributed throughout the system; if one switch section breaks down, the network bypasses it and keeps operating. The system will cost less to use because customers will only be charged for actual throughput.

One of the first local applications for QPSX will be in CAD systems. CAD users will benefit from improved quality graphics and faster screen updates. Other QPSX users will include banks, government departments, airlines, media and manufacturing companies.

Telecom will undertake a five million dollar QPSX trial in Melbourne later this year. A second pilot network in Sydney will be used for demonstrating its features to potential customers. □

Educational Software

The amount of available educational software grows every year, and this year is no exception. The total number of products runs into the thousands and the task of selecting a program to suit your needs has become even harder. This year there are a number of new offerings that make the most of colour graphics, animation and sound that computers like the Amiga and the Apple IIGS have to offer.

This is just the beginning – in five years time, the programs that now have interactive animation elements in them will be commonplace, and they will become even more colourful as the hardware and the market spreads.

This survey is only intended to be a guide to what is available: we could not possibly mention every program. The major educational software distributors have yearly catalogs with more product details.

Prices do not include sales tax. Add around 14 per cent for the approximate retail taxed price. The prices mentioned are generally for single programs. Multiple disk packs and classroom lab packs are available for many of these products.

Before you purchase, be sure that your particular computer configuration is suitable to run the program. Some of the more colourful programs need colour monitors and extra RAM memory.

Other things to bear in mind are details such as the size of character display if the program is for young children. Some programs can display three sizes of text for language learning. The category headings are not always clear-cut for some programs. For example, an interactive game may be applicable to geography, integrated studies and mathematics, as well as games. □

Art & Graphics

Cricket Draw
Cricket Software
From: Softime
Price: \$524

For the Macintosh, this is a drawing package that includes rotation, tilting and duplication of objects, and a 'fountain' fill which produces a spectrum of light to dark fill. Suitable for Grades 5 to adult.

Graphics Bank
Ashton Scholastic
From: Softime
Price: \$79.95

An Australian picture library containing over 200 graphics of wildlife, history and features unique to Australia. Graphics can be transferred to Printshop, Newsroom, Garfield, Principal's Assistant, Mousepaint or Sticky-bears. Supports Epson and ImageWriter printers. For grades 3 upwards, and the Apple II.

GS Paint
From: Softime
Price: \$88

Paint program for the Apple IIGS that puts the power of colour, shape and pattern manipulation at your fingertips. It is possible

to animate images and change the foreground without moving the background.

Mac Vision
Koala Technologies
From: Softime
Price: \$462

Video digitizer for use with most popular video cameras. Mac Vision brings pictorial material to the Macintosh environment, adding impact to brochures, newsletters and other printed work. Any RS170 video source may be used, including video recorded with a freeze frame facility.

Image
Cambridge University Press
From: Softime
Price: \$124

For use with the BBC micro, this image processing package allows mixing of colours, patterns and textures. Can be used with a joystick, mouse, graphics tablet or the cursor keys. Suitable for grades 4 to 12.

Rainbow Painter
Springboard
From: Softime
Price: \$39.95

For children pre-school to grade 5, Rainbow Painter assists in motor skill development and is entertaining as well. The colour

picture menu has 10 categories of line drawings with 50 different brushes and thousands of possible colour patterns. Creative activities are encouraged with an infinite variety of possibilities. For Apple II and Commodore 64 computers.

Mask Parade
Springboard
From: Edsoft
Price: \$49.95

Mask Parade provides fun and creative activity for young children by allowing them to use the computer to design masks, hats, badges and jewelry. They can then print them out and wear them. The use of icons makes it easy to quickly change faces and costumes on screen. Suitable for grades pre-school to 3. For Apple and IBM computers.

Artroom
Clares Software
From: Edsoft
Price: \$125

A high quality graphics package that is easy to use. This program uses icons, with input via keyboard or mouse. Graphics may be created on screen or selected from the Graphics Library. They can be printed out, and a Guided Tour takes the user step by step through the procedures.

Deluxe Paint II
Electronic Arts
From: Edsoft and Amiga dealers
Price: Apple GS \$90

The definitive colour microcomputer paint package, Deluxe Paint was one of the early highlights in Amiga software design. It can be menu driven using the mouse, or keyboard shortcuts can be used instead. A full range of features include drawing tools, palette construction, instant area fills, textures, brush manipulation, zoom editing, perspectives, cloning and variable page sizing. Now available for Apple IIGS computers. Suitable for grades 3 to adult.

Dazzle Draw
Broderbund
From: Edsoft
Price: \$86

Dazzle Draw has a 16-colour palette with a Mac-like interface (pull-down menus and windows). You can create and store standard graphic files for use with other programs. Includes pattern-draw, spray painting, flood fill, cut, paste and edit, stretched boxes, circles lines and ovals and zoom editing. You can print your graphics or create a colourful slide show. For Apple 128K computers.



Business Studies

Developing Living Skills

Prologic

From: Softime

Price: \$79; Lab Packs \$237

A program that is designed to assist students with economic survival and money management on a domestic scale. It introduces them to the concept of the spreadsheet, budgeting, wages and salaries etc. Past and present living standards can be compared and financial data can be tailored to allow for inflation. For grades 6 to 11, and for IBM compatibles and the Apple II.

Consumer Mathematics

Prologic

From: Softime

Price: \$90

A spreadsheet approach to learning applications such as personal budgets, running a car, share market trading, and C.P.I. calculations. Models are supported by context sensitive help screens, excellent documentation and full mathematical functions. For grades 6 to adult, with the Apple IIe/GS or IBM computers.

The Market Place

M.E.C.C.

From: Softime

Price: \$65. Lab packs \$195.

Three simulations of a business environment teaches decision making with the assistance of colourful graphics and sound effects. The simulations cover price determination, the function of

advertising, and decisions about production. Unpredictable influences such as the weather increases the realism of the simulation. For grades 5 to 10. Apple II computer.

Databases

The First Fleet Resource Kit

Edsoft

From: Edsoft

Price: \$55

There are several software products available that have a 'First Fleet' theme, and this kit can be used in conjunction with any of these. Included are teaching ideas, worksheets, maps, a storybook by Harvey and Boardman which traces the journey of the youngest convict, a chart which lists all convicts, and an early map of Sydney. There are also copies of early letters.

The First Fleet Journals

Know Ware

From: Edsoft

Price: \$59

Two disks packed with information including a list of all people in the First Fleet, selected biographies on officials, surgeons, marines and convict men and women, and extracts from journals. The extracts describe such things as conditions during the journey, the arrival at Botany Bay, landing at Sydney Cove and interaction with the aborigines. Support material is also included. For grades 4 to adult. Apple computers.



The 'Explore Australia' program covers Australian history from Aboriginal Dreamtime, the First Fleet, Convict Life, Gold Rush and Early Explorers.

Explorer's Journals

Know Ware

From: Edsoft

Price: \$59 for set of three disks

Each disk contains the informative journals of an explorer's adventure. Know Ware's powerful word search utility and user documentation is also included. Disk 1: Captain Cook's journal of his exploration along the east coast of Australia. Disk 2: Blaxland's journal of the crossing of the Blue Mountains and Edward Wilson's journey to the south-west of Sydney. Disk 3: Edward Eyre's journey across the Great Australian Bight.

One World: Countries Database

Active Learning Systems

From: Edsoft

Price: \$128

Every country in the world is on this database. It includes information on demographic, political and economic data and has powerful search and analytical functions. It has proved to be a valuable quick reference guide and teaches research and data interpretation skills in the areas of geography, social science and current affairs. Suitable for grades 7 to 12. Apple, BBC, IBM, Commodore and Microbee.

"OOPS"

Object Oriented Programming is the single most important software technology today. OOPS is destined to dramatically change the way you use your personal computer.

OOPS is programming by defining objects, their inter-relationships and their behavior. Objects can represent both real-world entities such as people, places and things, and useful abstractions such as stacks, sets and rectangles.

Smalltalk/V



OOPS models the way you think and the way things really are. It lets you solve problems by breaking them down into easily handled sub-problems and their inter-relationships. The solutions you come up with can be re-used to solve new problems. Ultimately, OOPS makes programming a simple, logical process of building on the work of others.

Why thousands more are finding their way to Smalltalk/V.

First of all, Smalltalk/V makes OOPS easy. It's also fast. In fact, it's the fastest OOPS programming available on a PC.

And it's easy to learn. It comes complete with a tutorial that's the best introduction to OOPS available.

Smalltalk/V also has a few other features worth noting. Like a user-extendable, open

ended environment. Source code with browser windows for easy access and modification. A huge toolkit of classes and objects for building a variety of applications. A sophisticated source-level debugger. Object-oriented Prolog integrated with the Smalltalk environment. And bit-mapped graphics with bit and form editors, just to name a few.

Then, there's Smalltalk/V's unbelievable price of only \$199.

NEW! Smalltalk/V 286. For OOPS on 80286 and 80386 based computers **only \$395**

Optional application packs at \$99 include:

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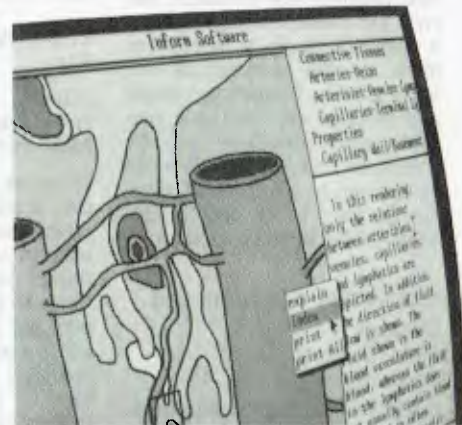
EGA/VGA Colour

Goodies 1 (Goodies 2 & 3 available soon)



▲ You can find Smalltalk/V in space.

On a project commissioned by NASA, Dr. Christine Mitchell at the Georgia Institute of Technology, chose to use Smalltalk/V as an integral part of a new man-machine interface. The application, written in Smalltalk, continually monitors the commands of the Satellite Network Operator, the state-of-the-network and the overall mission plans. To NASA, Smalltalk/V means real-time. Real OOPS. Real results.



▲ In an emergency room in Vancouver, it's saving lives through animation.

What if a medical textbook could come to life? What if it could show the effects emergency treatment might have on patients? And do it all through moving pictures? These thoughts led Folkstone Design, Edge Training & Consulting, and Inform Software in Vancouver, to create the first animated, interactive textbook for emergency room technicians and in-training paramedics.

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Desktop Publishing

Publish It!

Timeworks
From: Edsoft
Price: \$165

A full-featured publishing tool with built in word processor and graphics-handling capabilities. You can easily learn how to create and change layouts, select typefaces, create text and graphics, or import them from other programs like Appleworks and Bank Street Writer. Text can be flowed into columns even if the columns are separated by several pages. Text can flow around graphics, and the layout, size of columns and graphics, typefaces and styles can all be changed at will at any time. Print out your results using most popular dot-matrix and laser printers. For Apple IIe, IIc, IIGS computers. IBM version to be released.

The Newsroom

Springboard
From: Edsoft
Price: \$89.95

The Newsroom allows you to print your own newsletters, with over 600 pieces of clip art and a built-in word processor. Text can be arranged around illustrations and edited. If you have a modem, you can send and receive text and pictures between IBM, Apple II series and Commodore 64 computers with Newsroom. Extra Clip Art disks can be purchased separately. For Apple, Commodore 64, IBM PC computers.

Personal Newsletter

From: Dataflow
Price: \$89.95

Personal Newsletter has the ability to mix text and graphics on the page in the layout you choose. Print out your results using any popular printer. Includes 6 fonts in 10 styles, 30 built-in fill patterns, and the ability to create borders around windows and pages. It is possible to import ASCII text files, and it will accept graphics from Print Shop, Newsroom, Dazzle-draw, and PublishIt. It has an in-built word processor and graphics editor, and over 200 pieces of clip art. For Apple IIe, IIc, IIGS computers with 128K.

Early Childhood

Early Games

Springboard Software
From: Dataflow
Price: \$39.95 IBM

Nine picture games that teach children to add and subtract numbers, say the alphabet, draw, and type with the keyboard. The picture menu makes it possible for children to play games by themselves. Also available for Apple, Commodore 64 and Macintosh computers.

Animal Alphabet and Other Things

Random House
From: Dataflow
Price: \$59.95

Full colour animation, user-controlled sound and high resolution graphics are some features of this program. Transformations, surprises and hidden letter clues help students learn letter and word recognition in a fun way. Suitable for grades prep school to 2. Apple computers.

Vegetable Patch

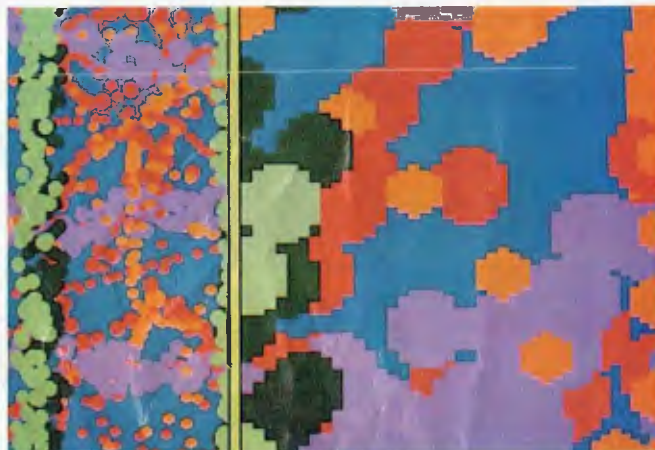
Jacaranda Software
From: Softime
Price: \$60

Robby Rabbit needs help. He lives in a large burrow next to a family that grows vegetables. He likes to store vegetables in his storeroom and has a busy time avoiding sprinklers, tractors and animals. Includes a booklet, cassette tape, and fold-out frieze. Suitable for grades prep to 4. Apple II and BBC computers.

Tonk in the Land of Buddy-Bots

Mindscape
From: Softime
Price: \$64.95

An interactive adventure game designed to reinforce skills in shape/pattern recognition, concentration, memory, critical thinking and decision making. The program consists of 5 educational games, each with 4 levels of difficulty and an adventure which takes Tonk into the land of Buddy-Bots. For grades 1 to 5. Apple computer.



'Deluxe Paint II' by Electronic Arts, which has been recognized as a benchmark paint program for the Amiga, is now available for the Apple IIGS.

Games

Utopia

Unicorn Software
From: Dataflow
Price: \$69.95

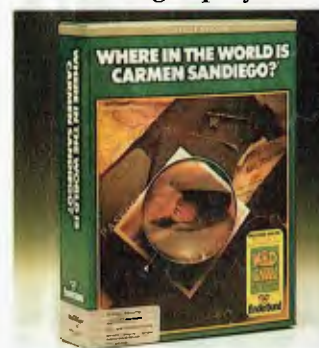
Your assignment is to set off from your dying galaxy to find the haven called UTOPIA. Your ship crash lands on a strange planet with UTOPIA just across a magical lake in the distance. You must find and collect 80 objects by traveling through numerous locations encountering mystical creatures along the way. For grades 3 to 12. Macintosh.

Dread Dragon Droom

Resource
From: Edsoft
Price: \$69

An adventure story in which Princess Arminda has been kidnapped by the wicked dragon Droom and Prince Henry has been turned into a frog. Children participate in the adventure by setting out to rescue Arminda, encountering fairies, trolls, a witch and a wizard along the way. Their progress depends upon solving mathematical problems and puzzles. Children can participate at their own pace as they can leave and re-enter at any stage. Includes supplementary activities, teacher's guide, program documentation, case studies, and backups. For grades 4 to 8. Apple and BBC computers.

Geography



Where in the World is Carmen San Diego

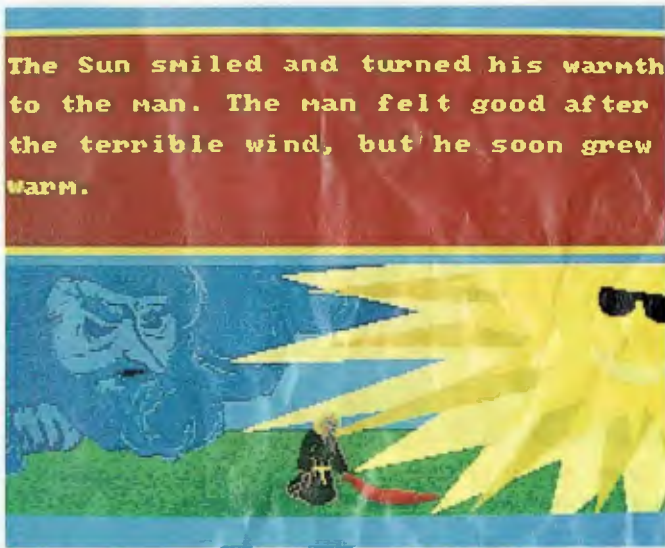
Broderbund
From: Softime
Price: Apple \$64, Commodore 64 \$84, IBM \$84.

This is a simulation game involving students in the search for a master thief to the far corners of the globe. Students locate and use international geographic information with a combination of graphics adventures, trivia games, mysteries and animation. For grades 4 to 9.

Cunning Running

Jacaranda Wiley
From: Edsoft
Price: \$35

This product simulates an orienteering course and encourages map reading skills. Students can practice the skills of understanding and reading map references and co-ordinates.



'Aesop's Fables' by Unicorn has large, easy to read text and colourful graphics. For the Amiga computer.

History

ZooPak

4Mation, published in Australia by Jacaranda Software
From: Softime
Price: \$69.00

A cross-curricular package for infants and lower primary classes. It has a cross-curricular zoo theme that encourages problem solving and emphasises language skills. For BBC, Apple and Commodore 64 computers.

Investigator

Prologic
From: Softime
Price: \$90.00

Investigator is a comprehensive survey package which can be used to survey a wide range of issues. Suitable for Geography, Social Studies, English and Maths applications. It is possible to design your own survey with a range of question types. Ideal as a teacher's resource as well. For grades 6 to tertiary; Apple or IBM computers.

Explore Australia

Dataflow
From: Dataflow
Price: \$149.95

Designed and written as a history

adventure, this is an interactive program that combines history, geography, social studies, art and creative writing. The colourful graphics and animation are quite stunning, and the program can be operated using a mouse, joystick, touch screen, or koala pad. Australian history is covered from Aboriginal Dreamtime through to the First Fleet, Convict Life, the Gold Rush and Early Explorers. Children can read complementary stories from the Student Book, and there is a teacher's manual as well. On screen images can be re-worked and printed out at any time.

Bangotcher Junction to the Rescue

Prologic
From: Softime
Price: \$90.00

A program designed to stimulate reading and writing in various genres including fiction/non-fiction, expository, narrative, reports, letters, lists and diagrams, dialogue, character description, re-telling, and code or invented language. It can be used individually, in groups, or with a class. For primary and early secondary classrooms, it also relates to the popular children's book *Adventures at Bangotcher Junction* by Jill Morris and Mary Lancaster. For Apple and IBM compatibles.

Language

Spellbound

Learners Image
From: Dataflow
Price: \$59.95

This program makes use of the Amiga's capabilities by combining animation, graphics, music, and digitized speech to create a fun learning atmosphere. Spellbound is designed to make use of the spelling list that the child brings home from school. Adult assistance is required to enter the spelling list, and after that the computer takes over with games that teach sight recognition skills to the child. Suitable for grades 1 to 5. For Amiga computers.

Read-a-Rama

Unicorn Software
From: Dataflow
Price: \$69.95. Mac \$89.95

Five modules to assist children who are just beginning to learn to read and spell: Word-a-Rama teaches word recognition using matching pictures, Read-a-Rama helps build discrimination and reading skills, and Spell-a-Rama has the child correctly spell the word representing the picture shown on the screen. Read and Remember is an exciting memory game for one to four players, and Spell and Remember is an authoring system where parents or children can enter their own spelling lists. For Amiga and Atari ST.

Aesop's Fables

Unicorn Software
From: Dataflow
Price: Apple II/c \$59.95. IIGS, Amiga, Atari ST \$69.95

Large easily read text and stunning graphics make this reading program an enjoyable experience. There are four different learning modules: Aesop's Fables, with each fable accompanied by comprehension and vocabulary questions (over 700 questions and answers); Aesop's Spells - a spelling exercise using sets of pictures and words; Spelling Skills - another spelling builder containing over 800 words. Memory Builder - a one or two player game designed to enhance memory and sight reading. For grades 1 to 3.

Police - Language in Evidence

Cambridgeshire Software House
From: Softime
Price: \$79.00

A cross section of language activities based around events at the Blyston Constabulary. It simulates the computer control room over a period of 7 days, during which a number of crimes are committed, which the students have to solve. Package includes student worksheets, photofit pictures, a map of the town, cassette tape of interviews, and an extensive teacher's guide. Integrates reading with oral and listening skills, writing and problem solving. For grades 5 to 9. BBC and Apple computers.

The Writing Adventure

DLM
From: Dataflow
Price: \$79.95

This program teaches creative narrative writing while stimulating students to write well. A graphic scenario is viewed that represents a potential story. The computer then prompts with questions to assist students to formulate a plot. These 'storystarters' are then used by the second part of the program, where students complete their stories and edit them for correct usage (also prompted by the computer). For grades 4 to 8. Apple and Commodore 64 computers.

The DIRECT Helper Scheme

Dataflow
From: Dataflow
Price: Apple IIc \$294.00

This is a remedial program developed in Australia to teach the slow reader to unscramble words, read from left to right, and place words in a meaningful sentence. It can also help frustrated adults and it can be used at home or at school. DIRECT Helper is an open-ended system, and teachers and parents can enter their own reading and spelling material to suit the needs of the student. The respected TREND reading series has been put onto diskette and can be used in conjunction with DIRECT Helper. For Apple II series and Commodore 64 computers.

Mathematics

Fraction Factory

Springboard
From: Softime
Price: \$34.95

Fraction Factory makes learning fractions fun. Describing fractions, multiplying, dividing, adding and subtracting fractions through the use of colourful graphics and sound. If the child is having difficulty, helpful hints appear until the problem is solved. For grades 6 to 9. Apple II, Commodore 64 and IBM computers.

Every Chance

Prologic
From: Softime
Price: \$115.00

A composite package of worksheets, cards, counters, coins, die, teacher's guide and program, Every Chance teaches the ideas behind probability theory. Either concrete materials or the computer can be used to simulate chance processes. Concepts learned can be extended to a wide range of problem solving applications. Authored by South Australian Kevin Olssen. Suitable for grades 6 to 12. IBM, Apple and BBC computers.

Timpani

Prologic
From: Softime
Price: \$75.00

An easy-to-use spreadsheet program designed for teachers and students who want to learn more about the concepts behind spreadsheet use. Timpani has two modes, model and spreadsheet. In model mode, the user develops an application. In spreadsheet mode the scope of the model is extended. On-screen help is available in either mode, and the spreadsheet sup-

ports full mathematical functions. For grades 6 to adult. Apple and IBM computers.

Odd one Out

Sunburst Communications
From: Edsoft
Price: \$84.95

This program displays four items on screen, and the student has to identify the odd one out. Varying levels of difficulty provide students with increasing challenges. The teacher can modify and customize the items. The program has advanced colour graphics, sound and animation. Colour monitor required. Suitable for grades Pre-school to 6. For apple and Commodore 64 computers.

Interpreting Graphs

Sunburst Communications
From: Edsoft
Price: \$84.95

Two programs to teach students how to interpret graphs: 'Relating Graphs to Events' puts the focus on functional relationships rather than on numeric values. 'Escape' is a game that builds on graphing skills. A teacher's guide is included. Suitable for grades 5 to 10. Apple and IBM PC's.

The Geometric Supposers

Sunburst Communications
From: Edsoft
Price: \$130.00 each

These programs teach geometry in an interactive way with the objectives to provide students with tools with which to learn about the properties of geometric figures. The Geometric Pre-Supposer: Points and Lines is the introductory package. The Geometric Supposers: Quadrilaterals, Circles and Triangles are three packages which expand the student's knowledge further. For grades 6 to 12. Apple Computers.

Good educational software

'Good' educational software, like any 'good' package, is simply that which meets the needs of the intended user. For a package to be a good teacher, though, there are certain requirements and standards that should be met - and concepts that should be kept in mind when choosing a package. For a background to buying appropriate software, see 'Educational Software - an Overview', in our September 1987 issue (which also included reviews on a number of education products) and 'Computers in Music Education', February 1988. Back issues are available - refer to the Services page.

Science

Motion:

Microcomputer-Based Lab HRM

From: Softime
Price: \$350.00 Requires MBL interface, \$199.00

Motion is one of a number of HRM Microcomputer-based Labs that offer teachers and students experiments in Science, Mathematics, Human Physiology and Chemistry. The Labs include all the equipment required to perform each experiment, together with comprehensive teacher support. Motion uses a sonic probe which plots position, velocity and acceleration directly on the screen. Students are able to graph their own movements, including walking, turning, running, slowing down etc. and quickly learn to produce and interpret graphs which can be saved or printed. For Apple computers, grades 6 to adult.

Science Toolkit-Master Module

Broderbund
From: Softime
Price: \$88.00

This toolkit consists of sensory probes and instruments, including a thermometer, light meter, timer and a strip chart. The probes connect with an interface box and the joyport on the Apple II allowing real world experiments to be performed with the computer's assistance. Modules are also available for \$59.00 which explore speed and motion, and earthquakes and seismic activity. For grades 5 to 10.

Geologists at Work

Prologic
From: Softime
Price: \$85.00

Students determine the geological history of a land mass through techniques such as mapping and core sampling. A map is selected from three levels of difficulty, or one designed by the teacher. The program allows printouts of the cross section, a transverse section and the geological map, which can be assembled to form a three dimensional model of the land mass. For grades 8 to adult. Apple and IBM computers.

Social Studies

Goldfields

Jacaranda
From: Softime
Price: \$65.00

What was life like on the goldfields? Find out with this simulation of Australia's early heritage. Decisions are made, risks taken, and consequences borne. For grades 4 to 8. Apple II and BBC computers.

Sheep Dog Trial

Jacaranda
From: Barson
Price: \$40.00

A grid display is the sheep paddock, and students are required to muster the sheep using alphanumeric grid square references. Each student has a dog which must be positioned in the grid so that the sheep walk in the right direction. For grades 3 to 9. BBC computers.

Quick Cartage Company

Jacaranda
From: Barson
Price: \$49.95

Up to four students can practice map skills in this simulation package. Players drive trucks around the city and the surroundings without crashing or running out of fuel. For grades 3 to 8. BBC computers.

Word Processing

Paws

Jacaranda Wiley
From: Edsoft
Price: \$50.00

Paws is designed to teach young children keyboard skills. There are 17 lessons, with hints and reminders and open screen practice exercises. Grades 2 to 6, Apple and Commodore computers.

Typequick

Typequick
From: Edsoft
Price: \$87.00, school license \$495.00, college \$1495.00

Award winning keyboard training course designed around a 10 lesson format for the main keyboard

and a 3 lesson course for the numeric keypad. A personalized course is provided for each student with helpful feedback and records are kept for each lesson. The program automatically modifies the exercises according to the student's progress and the keyboard speed desired. For grades 7 to adult Apple, IBM computers.

Typing Tutor
Academy Software
From: Dataflow
Price: Amiga, Atari ST \$54.95; IBM, Apple \$49.95.

This program makes learning the keyboard easy. The program starts with the home keys and automatically advances as your skills improve. Mistakes are identified, typing speed is indicated and success is rewarded with a song. Included is Word Invaders, a game that involves blasting invading words out of the sky before your base is destroyed. For grades 1 to adult.

Typing

Multiscribe

Styleware
From: Softime
Price: \$132.00
Word Processor for the 128K Apple IIe or IIc with pull down menus. There are no complicated control keys to learn. You can choose from a wide variety of fonts, character styles and sizes. All commands and rulers are displayed and files created in Appleworks may be used in Multiscribe. Font packs are available for \$25.00 each. Grades 5 to adult.

Magic Slate

Sunburst Communications
From: Edsoft
Price: \$145.00 for 6 disks
Magic Slate is an easy to learn word processor for Apple computers. With a choice of 20, 40 or 80 column widths, it is suitable

for first grade to senior high school students. The 20 column width setting means that there are large letters appearing. This package suitable for a wide range of applications. A graphics printer is desirable, and the 80 column version requires 80 column card.

Folio

Tedimen Software
From: Edsoft
Price: \$99.00
For BBC computers, this word processor has small medium and large print, fancy fonts, a menu driver and it includes the new Australian writing script. The menu screen can always be accessed by pressing the escape key, and whole words and sentences can be entered with a single press of an overlay key.

Leap Frog

Caresoft
From: Dataflow
Price: \$49.95

This program is a game as well as a word processing starter kit for young children. Keyboard skills are taught in a structured way, and colour graphics are effectively used. Suitable for grades 4 to 6. Microbee and Apple computers.

Distributors

Distributor: Dataflow
134 Barcom Ave, Rushcutters Bay 2011 NSW
(02) 331 6153
Distributor: Softime
19 Cato St, Hawthorn East 3123 Vic.
(03) 209 0255
Distributor: Edsoft
Unit 5, 2-6 Apollo Court, Blackburn 3130 Vic.
(03) 878 4899
Distributor: Barson Computers
55-61 Talavera Rd, North Ryde 2113 NSW
(02) 88 9444

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Description
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PC Security

JAKE RANG rang me on the scrambler last week and asked 'Vizs zantu zo zqshdkd nm rdbtqhsx?'. Code, in its simplest form, such as moving the letters of the alphabet one space left or right from their normal position, would see this cryptic message translated to 'What about an article on security?'

Security for your PC and the data it carries cannot be minimised. It does not necessarily mean that it should be secure from prying eyes, but should at least be secure from potential disasters to your hardware or physical loss of storage medium. We are all aware of the suggested ways of handling floppy disks, but most seem to treat such floppies with a certain *panache* based on the incredibly good luck we've had with them in the past.

Today's hard disks are phenomenally reliable when you consider the amount of work they are asked to do and this reliability of hardware can easily lull you into a false sense of security.

Even as I write this article, I must hang my head in shame and inform you that my ALR 386 lies beside me with its 20 megabyte hard disk finally operating again after an horrendous crash. I had failed to secure a mains plug between the computer and the monitor and whilst moving the computer about, the plug had loosened enough to 'buzz' in its socket, effectively turning the computer on and off about a thousand times a minute before I recognized the fault and hit the mains switch. The effect was total unreliability of the hard disk, files unreadable, a series of different error messages and a lot of head scratching. Every disk operating message was displayed at various times: *Warning . . . this disk may not be formatted; Unable to read data on drive C;; Drive C: not available . . .*

I was loath to accept that my hard disk was to blame and tried a new controller

In the first part of our series on all aspects of PC Security, Ewart Stronach tells how to secure your data against hardware disasters.

card, new cables and even a new power supply, before finally borrowing another hard disk and setting about recovering the data which I should have secured by backup anyway. I won't bore you with the details of how this was accomplished but what should have been an hour's work from backup disks took nearly three days of spare time. I recovered all but the data which was on the portions of the disk which were physically damaged, reformatted the disk with the loss of only about 130 kilobytes and am back in business. It is important to note that Murphy's law plays a very large part in such occurrences, and the most significant data is the most likely to be unrecoverable.

The subject of security therefore becomes like the chicken and the egg question. What to secure first? Checking the plugs would have been a primary security measure in the above case. The same effect could have been caused by a 'brown-out' or sudden lowering of power supply from our normally reliable Sydney County Council. Should I therefore have a back-up power supply?

Similarly, should I have a spike arrestor on the line to check power surges or lightning strikes and what is the use of any of these measures if someone walks in and steals my beloved computer, data and all?

There are hundreds of companies out there offering all sorts of security devices for any potential disaster. You could spend a veritable fortune protecting both your hardware and software, but it all boils down to how much security do *you* need. Lets look at each area in turn.

Physical security

In this category I mean the potential loss of the hardware in the worst possible way, fire or theft. My first reaction is to pay someone else to lie awake at nights and worry about it, in other words, insure it well. Examine your household policy to be sure there is no exclusion clause for any single article above a certain value if it is a home user situation or speak to your insurance company specifically if in a business environment.

If you have a fire proof safe or cabinet, check with the manufacturer about how long the temperature can be controlled inside, as cabinets described as fireproof seldom are. Such cabinets may well stop paper documents from being destroyed but the inside temperatures would spell goodnight to a floppy disk.

Clearly brand your equipment with its serial number on the case with an etching pen. I'd rather be dismayed by an unsightly sign on my computer than a clean patch on my desk where it used to be. Keep a list of serial numbers of all major units together with a good working description of them. I have seen the Police Property Room at Zetland where vast quantities of recovered stolen goods languish for want of identification.

If you are in an open office system or have to leave equipment in a reception area, unguarded during inevitable tea breaks, there are locking pads available. These have two parts, one screws to the desk and the other to the computer. The two parts have mating brackets with a key

SECURITY

(C) 1987 PRIME SOLUTIONS INC. SAN DIEGO, CA. 92109 USA
 DISK TECHNICIAN AUTOMATED AT SOFTWARE SYSTEM REV:4.03 SER: 3577-0540-10
 PREVENTS/DETECTS/REPAIRS/RECOVERS DATA LOSSES AUTOMATICALLY BEFORE THEY HAPPEN

COMPUTER:AT SAFE ZONE:34,816 DOS:3.3 DRIVE:C DISK SIZE:21,309,440
 USED:11,227,136 MARGINAL:0 UNSAFE:0 AVAILABLE:10,047,488

PREVIOUS TEST/ ANALYSIS DATES	ERROR DETECTION, ANALYSIS AND REPAIR RESULTS						RUN TIMES
	SOFT 1	SOFT 2	SOFT 3	SOFT 4	HARD	REPAIRED	
DAILY:00/00/00	0	0	0	0	0	0	HR 0 MIN
WEEKLY:00/00/00	0	0	0	0	0	0	HR 0 MIN
MONTHLY:00/00/00	0	0	0	0	0	0	HR 0 MIN
TODAY:07/22/88	13	0	0	0	0	13	1 HR 38 MIN

TODAY'S DATE:07/22/88-FRIDAY CYLINDER: 0- 613 TESTING CYLINDER:ALL
 DRIVE LETTER:C HD PHYSICAL HEAD: 0- 3 TESTING HEAD:ALL
 SELECT TEST :MONTHLY AUTOMATIC SECTOR: 1-17 TESTING SECTOR:ALL

Cumulative preventions/detections/repairs/recoveries from 07/22/88 TO 07/22/88

	SOFT 1	SOFT 2	SOFT 3	SOFT 4	HARD	REPAIRED
FAULTS:	13	0	0	0	0	13
BYTES:	6,656	0	0	0	0	6,656

	DATA SECTORS	SYSTEM SECTORS	TOTAL ERRORS
FAULTS:	0	0	13
BYTES:	0	0	6,656

Total potential problem bytes continually being specially monitored by each Disk Technician run: 113,152

Disk Technician writes and reads to every byte and bit on a hard disk, whether it is being used or not, to test for soft errors (errors that may or may not repeat after further testing), hard errors, and magnetic retentivity (a sample report of a test is shown above). This information is then stored in a database; on subsequent runs of Disk Technician, this data is compared with current test results and used to determine if a particular area of the disk had an abnormal failure rate - or to predict hard disk failure.

The package also includes SafePark, a memory resident utility that senses when there has been no hard disk activity for 1 to 15 seconds (user set) and then moves the head to a safe zone. This prevents the loss of data due to static electricity, power spikes and brown outs while you're away from your computer for short periods. For additional information, contact Y-Micro on (09) 443 1555 or (02) 232 2579.

DSBACKUP + Version 1.10b, (c)Copyright 1986, 1987 by Design Software

Backup From : C:\
Backup To : A:\

Media Needed : 21 Total Size : 7350K Verify/Report : Off/Off Subdirectories : On Backup type : Normal Extra Drives : None Directory Sort : No Sort	<p style="text-align: center;">Main Menu</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">Options</td> <td style="width: 50%;">Filespecs</td> </tr> <tr> <td>Backup</td> <td>Restore</td> </tr> <tr> <td>Configure</td> <td>Utilities</td> </tr> <tr> <td>Setup load/save</td> <td>Quit</td> </tr> </table>	Options	Filespecs	Backup	Restore	Configure	Utilities	Setup load/save	Quit
Options	Filespecs								
Backup	Restore								
Configure	Utilities								
Setup load/save	Quit								

COMMAND COM	AUTOEXEC BAT	CONFIG SYS	~WRI3A22 TMP	TRUE BAK	BAK
SECURITY R86	SECBOX T86	SECURITY T86	SECURITY BAK	SECBOX BAK	BAK
TRUE T86	DISKNO COM	DSB HLP	DSBACKUP COM	DSBSTATS COM	COM
DSBTREE EXE	DST COM	INSTALL BAT	README DOC	REPORT EXE	EXE
RETRIEVE EXE	SPEEDBAK COM	SRETRIEV EXE	TESTBAK EXE	VERBAK COM	COM

Displaying C:\
PgUp, PgDn & Home to view files, Cursor

Options Menu	
Verify	Include hidden
Choose directories	Archive only
Subdirectories	No archive update
Reporting	By Date
Extra drives	Data squeeze

DS Backup provides an easy and efficient method of backing up and restoring a hard disk - and it's claimed to be ten times faster than DOS's backup and restore. The program can be driven by menu or from the command line and offers a variety of options, including 'Data squeeze' which can save a significant number of floppies (and floppy changes!).

lock and can't be taken apart without considerable effort. Like a car, there is little that can be done to deter a professional thief, but by making it a time consuming job to remove the equipment or preparing it for re-sale will probably stop the opportunist thief.

Contingency protection


This area should cover the possibility of data loss by physical occurrences. The primary problem is obviously the power supply. You should ensure as a minimum that the power supply supplied with your computer is highly enough rated to meet your immediate and future needs. Most PCs come with an adequate unit, often plenty for the configuration you originally bought but unsuitable for later purchases which need additional power.

Any time you add a new peripheral which draws current from the main unit, you *must* ensure that your power supply is sufficient. The supplier of the the add-on should be able to advise you of its requirements and it's lots cheaper to upgrade to a new power supply than carry out repairs after blowing up the old one.

The problem doesn't end there. I mentioned what are called brown-outs. These occur during periods of heavy loading on the local power supply, particularly during power strikes, and effectively lower the voltage available. There are two main ways of insuring against the effects of these. The first is a mains line filter with plenty of capacitors, which will hold the voltage steady for a very short period of time. Most brown-outs are, mercifully, of short duration and such a filter is sufficient.

Back up power supplies which give enough battery back-up for sufficient time to shut down in an orderly manner cost, relative to the time they support your machine. If the machine is attended all the time, five minutes should be enough time to shut down. If, on the other hand, your computer is alone in the office all night, working its little heart out collecting sensitive data from all over the country, you could need up to twelve hours of support. The amount of support needed can be minimised by automatically writing data to disks at regular time intervals.

Use caution with the number of appliances using the same power source. Many old buildings have many outlets running from a single 15 amp fuse and it doesn't take long to run over the limit, particularly if you start turning on electric heaters in winter. I have taken the precaution of adding a single power source to run my computer room at home so I know exactly what is being drawn from it. For the com-

An advertisement for Anchor Pad, a security product for office equipment. The background is a dark, textured wall. In the foreground, several pieces of office equipment are shown, each secured with a grey Anchor Pad. From left to right: a large monitor on a stand, a desktop computer unit with a floppy disk drive, a smaller monitor on a stand, and a laptop computer. Three yellow pencils are lying on the surface in the bottom left corner. The text is positioned in the upper right quadrant of the image.

Anchor Pad has a range of products designed to secure a variety of office equipment, including desktop and tower computers, monitors, typewriters, digitising tablets and calculators. Configurations are available that allow components (like standalone disk drives) to be stacked; the units can also be mounted on a 360 degree swivel base. While the standard Anchor Pads are designed to bolt through the desktop, double-faced, metal adhesive mats can also be used. For more information contact Anchor Pad at 159 Victoria Rd, Drummoyne 2047 NSW, (02) 819 7322.



puter in sensitive use the answer is unequivocal – one computer, one power source.

Software protective measures

There are a number of software packages available which offer a range of software tests and repairs to your data storage. A fairly recent addition to this range is a program called Disk Technician. Disk Technician is installed in your PC and quietly goes about 'housekeeping' in an automatic sequence. When your Disk Operating System comes across a piece of data it cannot read on your disk (hard or floppy) it automatically retries to read it up to ten times before giving you that stomach wrenching message *Unable to read data on drive C:*

The retries are carried out with such speed that they are invisible to the normal user and the data is regularly read on subsequent retries before the error causes the system to halt. Disk Technician recognises these retries and automatically shifts the data from the suspect area as soon as it is able to read it. Subsequently,

Disk Technician goes back to the suspect area and electronically cleans the disk and checks it thoroughly. If the area is still suspect it is locked out from further use.

Disk Technician builds a database of all the soft errors reported by DOS and, by the use of an inbuilt artificial intelligence system, constructs a failure pattern table which allows it to automatically set about cleaning up your disk and predicting failures far ahead of their occurrence. It has the ability to carry out a reformat of the area of the disk it senses has problems without disturbing the data contained there and by use of its database becomes more and more efficient as it used.

The failure pattern is written to a separate floppy disk, rather than the hard disk, and in the event of a seemingly total crash, vast quantities of the data may be recovered by use of this database. As a last resort after finding more errors than it can handle or when its database suggests a major crash is imminent, Disk Technician will ask you to call a human technician and supply the data he will need to analyze your problem.

The people who wrote Disk Technician have found that the majority of physical problems reported in PCs have their foundation in dirt, either on the connectors or chip sockets and an astounding 70 per cent of the boards returned for repairs had nothing structurally wrong with them which brings us to the next heading.

Preventative physical maintenance

The days of having to build an air conditioned, dust free room for your computer are, thankfully, behind us. But, the long term, fault free operation of today's equipment is still controlled by the environment. Dirt, dust, smoke and humidity are the enemy; while I can't suggest (puff, puff!) that you ban smoking from your computer room, you should carry out preventative maintenance more regularly if you smoke over the beast.

Most modern offices are, at least, reasonable in their atmosphere but if you have an application which demands running a PC in what could be called a hostile

SECURITY



This range of computer cleaning products from 3M is distributed by Imagineering (02) 697 8666.

environment, thought should be given to providing either a lock-up cabinet or at the very least adequate dust covers.

The outside of your PC should be kept clean by normal housekeeping routines and, perhaps more importantly, the innards should be cleaned too. The simple task of cleaning the dust and debris that gathers on the motherboard, particularly around the power supply is often as much as non skilled personnel can carry out.

For total maintenance far more should be done. If you do not have the technical skill, contract the work out to someone who does. Depending on the conditions, such maintenance should be carried out as often as every six months under adverse circumstances, or at least every two years.

Every circuit board should be removed (one at a time) and thoroughly examined. The edge connectors should be carefully cleaned with a proprietary contact cleaner. After cleaning the edges of the board, wipe more cleaner on the contacts and replace them in the mother board so they carry cleaner into the slots. Remove them and repeat the action to ensure that the slots are clean, then wipe off all cleaner.

Each and every socketed IC should be treated in the same manner and before finally replacing the ICs and the entire board, wipe the contacts with a contact dope. Do not use any abrasive material as a cleaner as the amount of gold plating on an edge connector is very thin and displacing it will cause more problems than any of us need. Finally, check all cables for a tight fit and adjust any pins which are not seating correctly.

The usual service center's fix for a board which appears to be defective is to replace it and charge accordingly - but: experi-

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Lightening struck twice!

ence shows that up to 70 per cent of such replacements are unnecessary and the faults due only to dirt and grime.

If you feel capable of carrying out such in depth work yourself, seek guidance the first time and be sure you have the right equipment. The contact cleaner and contact dope should be available from specialist electronic suppliers and you should also obtain some static free lint for wiping the components down. The cleaner and dope normally are supplied in spray packs but should never be sprayed on top equipment. The propellants may attack some plastics and the quantity dispensed by direct spraying is invariably far more than needed.

The recommended method is to spray the cleaner or dope onto the cloth and wipe it onto the contacts. Use as little as possible as, in this case, too much is more of a problem than too little. The surface should only appear to be shiny, not wet. Again I stress that this work should be carried out by suitably qualified personnel and only after total back up of any hard disk software or files.

The subject of backup deserves an article on its own. The number of times I have been asked to try and recover data after a system crash is astounding. The worst possible scenario should see you having to recover data no more than *one day old*.

There are many proprietary backup programs available and I choose to use one called DS Backup for its clear menu driven format and solid compression of files. It doesn't matter too much which you use as long as find one and stick to it. The backup command from DOS has limitations if you move files from one computer to another, particularly if the have differing DOS versions. The ultimate form of backup is a tape drive such as the Genoa Galaxy Subsystem from Hypec (reviewed in YC, January 1988); Alloy, (03) 561 4988, also offer a complete range of backup systems, as do Colorado, from Imagineering, (02) 697 8666. These can cost from about \$600 upward, but provide very reliable and transportable copies of your data.

I have covered the problems of security related to physical catastrophes in this article. The term security, of course, goes much deeper than this. In a subsequent article, I will look at the protection of your sensitive data from prying eyes. It's not as simple as coding your data, but I will examine methods of password protection, coding to US military standards and protection of 'on-line' equipment from unauthorised users. □

We hope this story from Chris Allen will help you avoid becoming another computer theft statistic.

Microcomputers have become consumer items; they are no longer the preserve of the hacker few. Like any consumer item, the laws of supply and demand come into affect. If enough people demand goods at 'special' prices, crime will supply the goods. Alternatively, if crime can supply the goods at 'special' prices, a demand will then arise. You may pick your favourite version of reality, but the facts tell us that microcomputer theft is here – probably for the duration.

Here's you one of life's true stories (only the names have been changed to protect the victims).

Company X was developing a sophisticated software package for a large and important client. The package was being developed on IBM PC and AT computers with expensive extras such as tape backup units, EGA screens and colour plotters. One Tuesday morning, after a long weekend, the staff arrived to find plenty of vacant desk space. Organized thieves had walked off with two IBM ATs and three IBM XT's. Curiously, only systems with colour screens were taken. Old 10 megabyte systems with colour screens were taken in preference to obviously newer models with mono screens and 20 Mbyte hard disks. It seems that these particular criminals weren't very computer literate.

Meanwhile, the DP staff went into shock (and the local pub) when they realised that their development machine with all the source code was missing. Not only did the thieves have over thirty thousand dollars worth of equipment, but they also had development software which cost three to four hundred thousand dollars to develop.

Fortunately, enough tape backups existed to reconstruct most of the work and the insurance company came through with funds for replacement machines. In the end, only a week of expensive development time was lost.

The building supervisors beefed up security. Key cards were changed and

reissued and security guards hired for random patrols. Two development IBM ATs were secured with Anchor Pads, one fitted with an encryption board.

Not again . . .

About six weeks later, after another long weekend, the unthinkable happened: lightening struck a second time.

The dazed DP staff were shocked but at least the damage wasn't as bad this second time. One AT and two XT computers were missing but each of the machines contained only partial sections of the system source code, if any at all (the programmers had suddenly developed a taste for mono screens).

Two of the three systems stolen were brand new replacements for machines stolen weeks earlier. Colour systems were again the preferred flavour. However, this time two brand new, fully configured IBM AT systems stayed exactly where they belonged, simply because of a device called Anchor Pad. The Anchor Pad, as the name implies, secured the computer system to the surface on which it sat. The thieves had removed all the connections from the rear of the units in expectation of heaving them off into the dead of the night. It would have been a joy to see the shock on their faces when the micros refused to budge!

All of which just goes to show, maybe they really are out to get you!

The moral of the story is that the potential damage of a theft is far greater than the cost of the hardware alone. Not only do you lose those productivity tools, such as computers, word processors, databases and financial aids, but your time expensive data disappears. That ain't productive, and if your data should somehow end up in a competitor's hands, it could be embarrassing – to say the least.

So – make sure you can recover from such a blow. Backups are the only answer (and they can be very handy in the event of hardware failure). Also, make theft of the hardware and the data as difficult as possible. There are a variety of packages available to help you in this area (see other articles this issue) and, combined with commonsense, you can keep your productivity tool on your premises where they belong (as well as being able to sleep soundly at night weekends).

The Power User

JUST AS REAL MEN may be known by their total abstention from quiche and pink champagne, Real Women by their avoidance of petrol pumps and Real Programmers by their unspeakable scorn of Basic and Pascal, so will a few tell-tale signs enable the observant individual to recognise the Power User of the PC (we are speaking here, of course, of the Power User of the IBM Compatible PC – there may well be Power Users of Apples and Amigas, but nobody at Cameron Computing Services knows any such.

Cameron Computing Services has prepared this profile of the Power User for the benefit of those readers of *Your Computer* who are not themselves Power Users: a careful reading of this profile will assist the reader in realising when he or she is in the presence of such exalted personages, which may happen at any time, for Power Users are all around us and may be encountered at any moment.

And quiet, mindful meditation on the text will prepare the reader for chance meetings with Power Users and help him or her to avoid committing any embarrassing solecisms in front of Power Users – trying to use PIP on a DOS machine, for example, which is tantamount to eating your peas off the knife, or admitting to thoughts of warm baths, gin and razor blades when confronted with an accidentally formatted hard disk, which thoughts testify beyond all question to a complete lack of moral fibre.

Impostors

Beware, firstly, the impostor, the pseudo-power user, who is nought but a Boojum. The pseudo-power user will brag of his supercharged Turbo Tower with 2 megabytes of Extended Memory and a hard disk the size of a soup plate, but in truth he can do nothing without the hardware. Admittedly, the genuine Power User will probably have a hard disk, but he will not necessarily have an AT. This may ap-

Cameron Computing Services has prepared a profile of the Power User for the benefit of those who may not be familiar with the type.

pear surprising at first sight, but a moment's thought will show that the very essence of Power Usership is the ability to make the most of limited resources, even the very product of the International Business Machines Corporation itself.

Faced with something that can only do 4.77 MHz, the true Power User will reach nonchalantly under his jacket, break out the trusty disk cache and the faithful old RAM disk and yield up his last precious kilobytes like a man, without so much as a murmur of complaint – the Power User always bows to the exigencies of the moment. If he is stuck with 256 kilobytes, he will go back to WordStar 3, which he imbibed with his mother's milk, and use SuperKey for the awkward bits. He will throw together a spreadsheet on VisiCalc, and if he hasn't enough RAM to use Norton Commander, he can get by quite happily with raw DOS – he prefers not to, of course, for Power Users are not puffed up with false pride and will take advantage of anything that will make life easier, but a Power User in a tight corner can access even the most deeply layered of subdirectories by hand, write batch files directly to the screen and sort an ASCII file straight from the Disk Operating System, even under version 1.25.

Speaking of ASCII, Power Users do not have the ASCII table by rote, or not beyond number 32 at any rate – like Sherlock

Holmes, Power Users do not clutter up the lumber room of their brains with information they know they can get from SideKick with a quick Alt-Ctrl-A. And speaking of SideKick, Power Users love it – some use nothing else. Any Power User worthy the name can create a relational database with the Appointments Calendar and complete a twenty-field mail merge armed with no more than the Dialer, the NotePad and the SetUp utility. Power Users also go for DOS 2.1 – they know very well that 3.21 is the latest thing, for Power Users are most diligent in reading the computer press, but they enjoy the challenge of a cramped environment. Bravado, perhaps, but Power Users are only human.

Power Users do not read software manuals, but this is only because Power Users do not buy software. Power Users do not scorn manuals – as we have noted, Power Users have no false pride, and members of Cameron Computing Services staff report having spotted known Power Users taking a quick shifty at software documentation in shops while the assistant boots up Symphony to work out the cost of a couple of floppies. Nor do Power Users write their own software, for knowledge of computer languages is by no means the hallmark of the Power User – Power Users are far too busy Power Using to learn computer languages, although most of them will know enough dBase to knock off a quick and dirty.

The reason why Power Users do not read software manuals, as we have pointed out, is that they do not buy software; and the reason why they do not buy software is that they know people who do. In return for help with recalcitrant printers, squabbling pop-ups and fractured File Allocation Tables, Power Users acquire vast – yea, veritably Alexandrian – libraries of software and have learned to use it by means of heuristics and sheer instinct. Power Users are nothing if not pragmatists.

The pseudo-power user will brag of his supercharged Turbo Tower with 2 megabytes of Extended Memory and a hard disk the size of a soup plate, but in truth he can do nothing without the hardware.



POWER USERS ENJOY A
CRAMPED ENVIRONMENT...

All work . . .

What of leisure? For the Power User does not spend all his waking hours in Power Use – indeed, the Power User has a wide range of skills and interests, bespeaking a lively mind and a probing intellect. Typically, he will be a competent cook and a passable squash player (the Power User maintains a healthy mind in a healthy body) and he will be able to turn his hand to plumbing and carpentry at need. He will usually play a tolerable hand of bridge and a good game of chess. In interviews conducted by Cameron Computing Services staff, Power Users have revealed spare-time interests ranging from collecting Venetian Ducats and Tibetan Jade to Nuclear Physics and Military History; and one Power User we contacted entertained us with an eloquent and lucid account of the brewing techniques of the Ancient Hittites.

In music, Cameron Computing Services has found that the Power User leans toward the decorative. He will be found listening to Bach and Corelli, Miles Davis, Rock Fusion and Greek Rebetika, Salsa, Scott Joplin and Irish Reels. He holds Chopin and Elton John in equal contempt but will frequently sing Norwegian Wood in the shower – semitones on sitar are guaranteed to intrigue him. His taste in reading matter displays the same fondness for the ornamental: he reads newspapers to satisfy his curiosity and keep up his end of the conversation at business

lunches, and naturally he reads *Byte* in bed; but his literature of choice is Tristram Shandy, Burgess, Chaucer and Joyce, Wodehouse, Leacock and Old Norse Myth.

Cameron Computing Services' surveys show that Power Users do not as a rule read Science Fiction, which is more the province of hackers, a very different breed. Power Users live in the real world – as we have seen, they are very pragmatic in their outlook – and although most of them will have read *Dune*, by and large they have no time for parallel universes and socio-metaphysical speculation. For similar reasons, Power Users' tastes in poetry tend to be confined to the limerick, and this survey has yielded no fewer than 18 versions of the one about the Bishop of Birmingham.

It is hard to make any generalisations about the Power User's taste in clothing. It has been noted that no Australian Power Users wear the kilt and it may be

that there is some conclusion to be drawn from this fact – certainly, many Power Users favour the Balans chair, which may account for it, but we are awaiting word from Cameron Computing Services Glasgow offices in clarification of this issue.

So – are Power Users born or made? Can those readers of *Your Computer* who are not Power Users hope ever to achieve Power User status? We at Cameron Computing Services are giving much thought to this question, for clearly there is money to be made: if a fumbling idiot can be turned into a Power User after a month or so of tuition at a grand a day, including a daily workout in the gym, Go and Mah-Jong courses, washing machine maintenance workshops and seminars on the Modern Novel and the Persistence of Balkan Folk Music in the Baroque Fugue, then Cameron Computing Services wants some of the action for sure. We shall keep you informed. □

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Lucid 3-D

BUILD A better mousetrap', they say, 'and the world will beat a path to your door.' The American company Personal Computer Support Group obviously agrees and the result is an award winning product it claims is going to be the spreadsheet for the 90s.

The fact that the market already included splendid mousetraps didn't deter its finding 152 features to detail on the back page of its brochure. I won't regale you with all 152, but I will outline some of the more interesting points of this spreadsheet. (Incidentally, it was first developed in 1984 for the Tandy Portable computer).

Lucid means easy to follow and understand, sane or rational, transparent or clear, and the name is apt as Lucid the spreadsheet is all of these things.

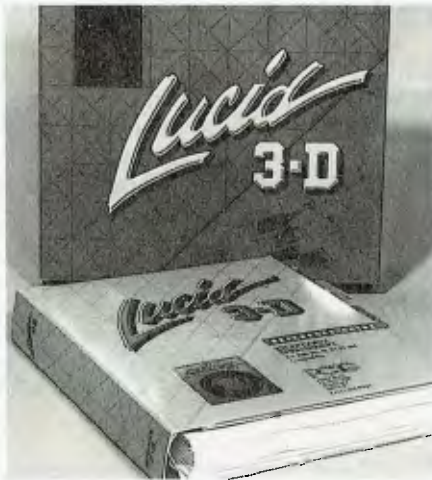
The program may be loaded as a normal spreadsheet, or loaded into memory (where it takes 90 kilobytes) and run as a background application. That's the way this review is written, with WordStar in the foreground, and Lucid brought in and out with the Alt and Shift keys.

Clipboard

Lucid's Clipboard allows cut and paste, that is, anything in a foreground application can be cut and pasted into Lucid and *vice versa*. This means that your favourite word processing program or another spreadsheet can run at the same time as Lucid and interchange text or data with it. However, this doesn't mean that spreadsheet formulae and macro's are interchangeable, although you can convert Lotus to Lucid and *vice versa* from a separate program, accessed from the resident mode.

The clipboard is a powerful and very useful feature. Whole ranges can be copied to it and inserted elsewhere in the file or in another application. Copying and moving is allowed within the Clipboard,

An annoying limitation to most spreadsheets is that they're 'flat' and only give a single view of the data they hold – but here's a three dimensional offering with a host of other powerful features (it's in the 'better mousetrap' category, according to Ivan MacLean).



and the Clipboard can be saved as a separate disk. The contents of the Clipboard remain intact when you exit from the program.

The Notepad is a full-featured editor that is used to create and save a separate note with each cell. It's accessed from the

command menu or by simply pressing F3. The Notepad window pops up immediately to record notes, comments about a spreadsheet's formulas and programming structure, or special instructions for others who might use the spreadsheet. It's useful for all kinds of editing needs such as batch files, letters and memos, and reminders.

Approximately eight pages can be typed into any note. A note can be printed separately with headers or footers, page numbers and margins, or be printed at the end of the spreadsheet in which it's entered, or all of a spreadsheet's notes can be printed as a group alone.

Don't confuse the Clipboard and Notepad: the Clipboard is only a holding place for data that is being moved or copied. However, the Clipboard can be used with the Notepad, as can Lucid's Find and Replace, Storage and Macros features.

Three dimensional

Any cell in a Lucid spreadsheet can contain another complete spreadsheet that may be accessed instantly with a single keystroke. This second sheet behaves exactly like the first, and can be continued to any desired depth in a three dimensional manner, while values or text from a sheet below will show in the sheet above. You go back up a level also with a single keystroke. The size and depth of the spreadsheets are only limited by the size of your disk storage.

Another 3D feature is that any cell may also contain up to a five-page document that can be accessed with another single keystroke. Notes, memos or letters may be written and saved as individual files and even printed separately. Lucid 3-D allows the user true modularity in the building of spreadsheets because it permits 'true' references to cells in other spreadsheets.

LUCID 3-D

Windows

Lucid allows up to nine windows open on the screen at once. These could each contain different spreadsheets, or more than one window could contain different views of the same spreadsheet. The windows can be resized, moved around, overlapped and zoomed. All can be done instantly with the mouse, or very rapidly through the command menus, or with alias keys such as /-Ctrl-Z to zoom a window to full screen size.

Lucid 3-D uses a menu approach that follows a simple design concept: it is easier to 'recognise' than it is to 'remember'.

The program has been designed around the mouse. There is quite a difference between programs that have had mouse menu interfaces added as an afterthought and a program that remained faithful from its inception to a mouse command philosophy. However, you don't need a mouse as easy keyboard operation follows as a result of the mouse driven philosophy — pointing can be done with the cursor movement keys and shooting with the Enter key.

Lucid 3-D uses a menu approach that follows a simple design concept: it is easier to 'recognise' than it is to 'remember'. You call up the command menu with the familiar /-key, just as you can use function key F10. However, as choices are made that take you to lower menu levels, you always can see exactly where you came from on the command tree. The complete menu path is always visible to prevent getting lost several levels down.

The program includes a sophisticated calculator which can be activated at any time — it should make the scratch pad and pencil kept next to the computer obsolete.

The help facility is so complete, a manual is scarcely necessary; plus, a tutorial is provided with the program. Lucid 3-D also provides some very intelligent user aids. When a mathematically incorrect formula is entered, the program

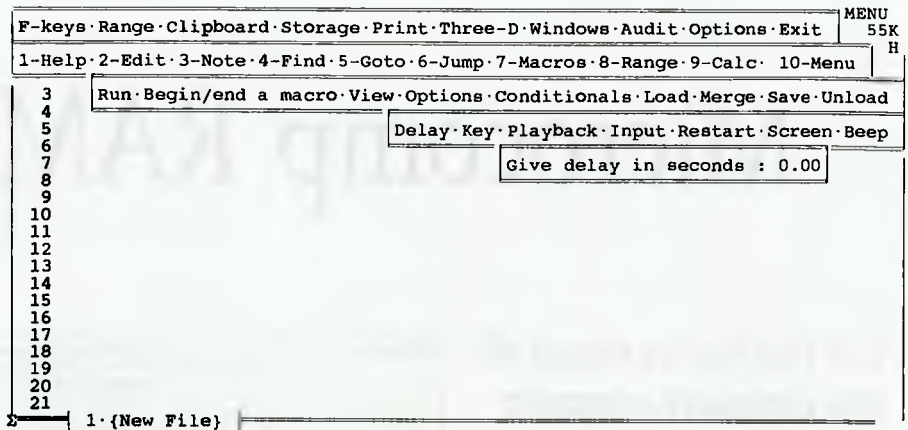


Figure 1. As choices are made from Lucid's menus, you always can see exactly where you came from on the command tree — the complete menu path is always visible.

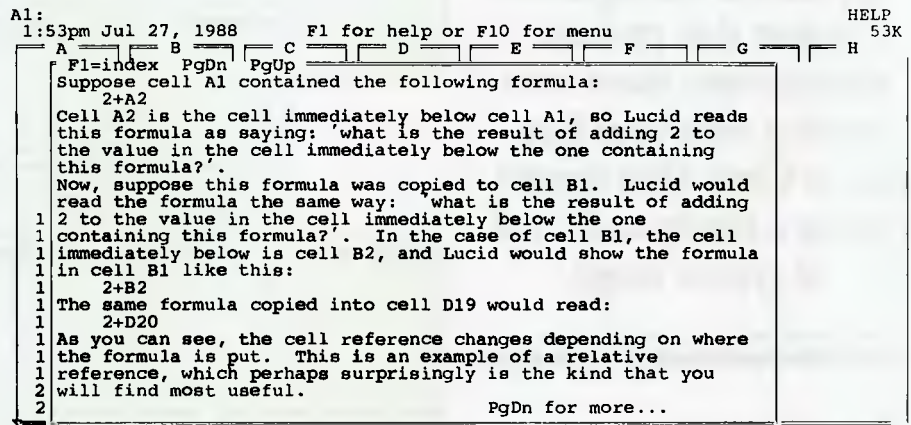


Figure 2. The help facility is so complete, a manual is scarcely necessary; plus, a tutorial is provided with the program.

prompts with a beep and places the cursor on the edit line at the exact position where the mistake was made.

Lucid supports every kind of monitor from monochrome to EGA. And it provides custom colour control from the command line instead of an installation program, which means that the colour of your choice is just a whim away.

Numerous special features have been incorporated into the design that just make the program fit a wide range of user needs. For example, Lucid's ability to create pop-up user menus that will access favourite programs or execute batch files right from inside Lucid and the capacity to specify a startup macro at the DOS command line, are both very useful.

While the program does not include a database, it's certainly still good value. Nor does it include graphics, but because it's so easy to transport data in and out of Lucid, I don't see this as a real problem. Generally users who are serious about graphics need something a little more sophisticated than most programs that come with integrated packages. □

Product Details

Product: Lucid 3-D
Distributor: Peripheral Systems
9/4 Campbell St, Artarmon 2064 NSW
(02) 437 6255
Price: \$299 taxed

Microcomp RAMS V5.01

Now that you've bolted all that expensive computer equipment to the desk, here's a Resource and Application Management System that prevents unauthorised users from messing with your files – and, as Chris Allen reports, creates a handy audit trail of system usage.

RESOURCE AND Application Management System (RAMS) is a menu based access and control system. Through RAMS you can control who has access to your system, which applications they may access, and through a usage audit trail, determine the time spent on any particular activity.

The system is based around users and departments. A user has a password and a startup menu which can be uniquely configured for their needs. A user also belongs to a particular department. An example will best illustrate how these areas work together.

Let's assume Bloggs P/L has three departments: marketing, production and administration. Joe Senior is a member of the administration department. His job is to be the computer system administrator. In the RAMS system Joe's password is PORSCHE1, although he can change it at any time. In the RAMS user database Joe is registered as being an administrator

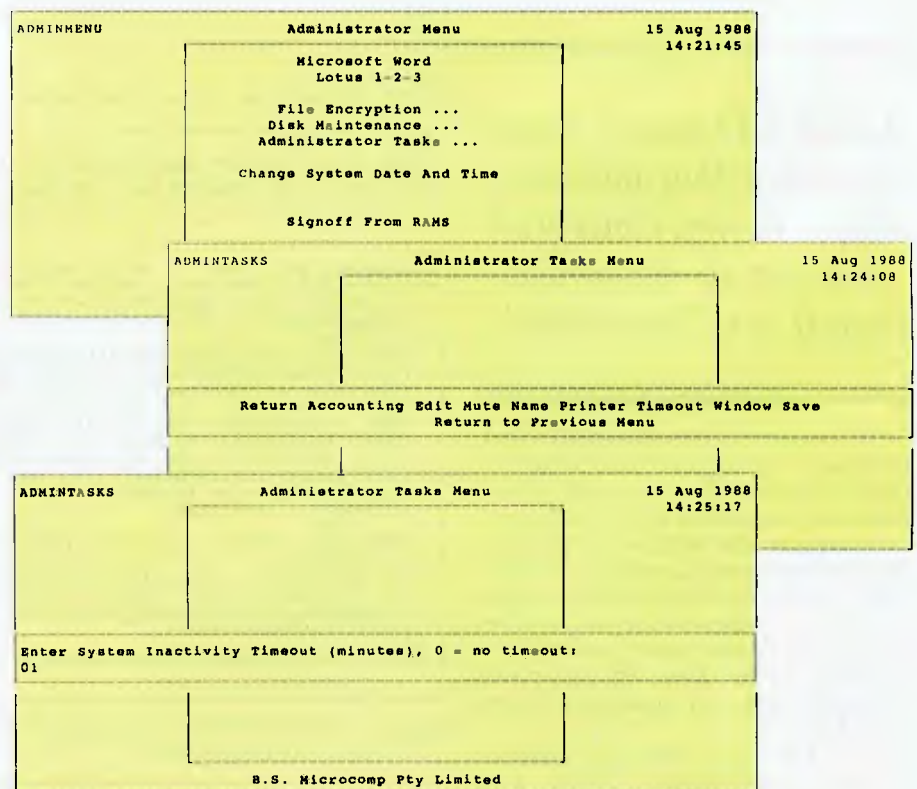


Figure 1. The designated Administrator of the system has access to the full range of RAMS options, while other users are restricted to that part of the system associated with their department (as defined by the administrator).

which gives him access to the full range of RAMS options. Joe even has his own startup menu which has options for all the tasks Joe commonly uses. One of Joe's most important tasks is to control access to the system and to report to management how effectively the computer is being used.

Just last week Alison 'have a nice day' Jones joined the marketing department. Alison wanted access to the usual programs that the marketing department cur-

rently uses, so when Joe registered her on the system he recorded that Alison was a member of the marketing department and that her startup menu would be the MARKETING menu.

This meant that when Alison signed on to the RAMS system the next day, she could access all the programs that marketing use. Each time she goes into or out of an application, the time spent is recorded in the RAMS accounting database. Alison cannot access some of the production

programs because the production manager doesn't want anybody messing around with his careful calculations and so only demonstration production programs are included in the marketing menu.

For most organisations the menu system alone would provide a comfortable degree of security.

Management wants Joe to produce a report detailing the time each department spends on the computer and on which applications they spend their time. This is a very simple task for Joe as RAMS already has just such reporting options. If something a little different is required, Joe can export the accounting information into another file to be imported in Lotus 1-2-3, for example. Joe is hopeful that when managing director I.M. Abeancounter sees the reports, he will notice how much time is taken by the production programs and then authorise the purchase of a faster computer or an additional system (or both!). Mr Abeancounter likes to see these facts on paper before he takes any action on the issue.

Through the use of Microcomp RAMS, Joe Senior is able to satisfy Mr Abeancounter's reporting requirements, MS Jones' need for easy access to the marketing programs, and the firm's overall security policy of keeping the cleaning lady out of their computer files.

Microcomp RAMS features a number of user/administrator configure options. Screen designs, prompts and menu options can all be changed without too much difficulty. The steps involved in configuring RAMS are fairly straightforward though a certain amount of computer experience would help. The manual is divided into two sections, one for users and one for administrators. Neither of these sections gives a step by step guide on how to configure RAMS or how to obtain the most from the system. A few hours of 'play' with the system would be enough for a reasonably experienced user to know how to get a functional menu driven system running.

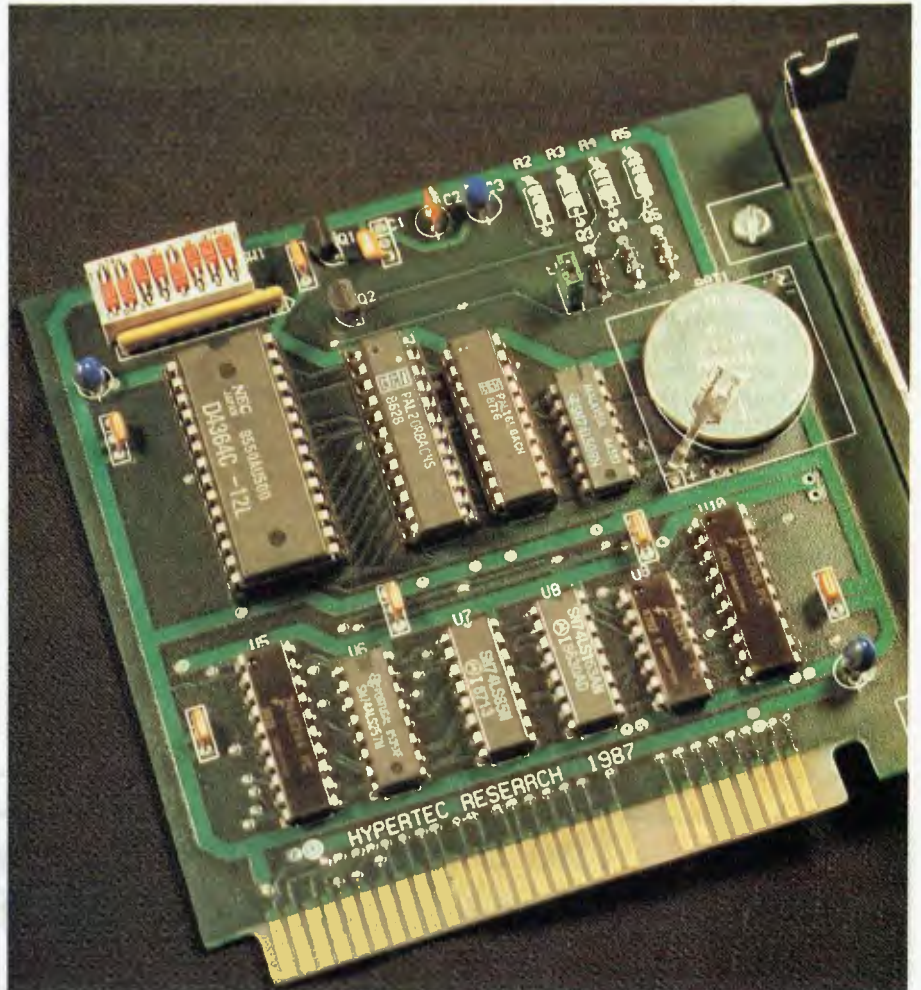


Figure 2. The only way to avoid the RAMS menus and passwords is to boot from a floppy diskette. To eliminate this potential weakness in the system Microcomp, have a Hardware Security Adaptor (a half-slot card) available which forces the system to boot from the hard disk drive. This combination makes it impossible for an unauthorised user to access the hard disk unless they open the computer and remove the Microcomp card.

Optional security

A key area of RAMS is the security option. This is installed by including a RAMS supplied device driver in the config.sys file of the computer which will cause the system to disable the break option (Ctrl-C) and prompt for a user name and password upon booting from the hard disk. This prompt must be successfully passed before the autoexec.bat file is called into action thereby eliminating the possibility of using Ctrl-C to abort the batch file before the RAMS menu is called.

The only way to avoid the RAMS menus and passwords is to boot from a floppy diskette. To eliminate this potential weakness in the system Microcomp, have a

half-slot card (known as the HSA – Hardware Security Adaptor) available which forces the system to boot from the hard disk drive. This combination makes it impossible for an unauthorised user to access the hard disk unless they open up the computer and remove the Microcomp card. To make even that possibility remote, you could secure your computer with an Anchor Pad (a physical device which very securely fastens the computer to the desk).

A file encryption utility is also included with RAMS. This allows you to encrypt any file so that it may not be read by anyone else.

The encryption is a two stage process.

First, you nominate the file to be encrypted and the key you wish to use to encrypt it (the key is simply a code which will uniquely encrypt a file). If the file SALARY.WK1 was encrypted with the key HOUSE1, that file would be unreadable until it was decrypted with the same key. Secondly you must purge the original copy of the file. The purge command writes dummy data over the original file and then deletes it via DOS. This is so the contents of the file cannot be retrieved by a program such as the Norton utilities. Tricks such as double encryption (two keys) are possible and the encryption and purge steps may be amalgamated into one procedure. The RAMS system does not support automatic decryption/encryption of designated files upon entering or leaving an application. The user must designate the file and key in each instance.

The RAMS system is supplied with 99 screens of context sensitive online help for all the RAMS options. Further help screens may be designed to match any menu options created by the system ad-

ministrator. All help screens are accessed by the F1 function key and a series of screens may be stepped through using Next and Previous screen options.

RAMS normally requires 140K of RAM memory overhead in order to run. This overhead can be reduced to as little as 5K (10K if the security option is in use) by altering the method of accessing applications.

Microcomp RAMS is keenly priced at \$99 for the menu system and \$395 for the additional security card. For most organisations the menu system alone would provide a comfortable degree of security. Creating customized limitations to the access a user has, is quite straightforward through the use of menus. With careful design, these menus could provide a hierarchical access system even though RAMS was probably not designed with that in mind.

A very accurate audit trail of the applications and options accessed by the user and/or department is available, although there is no facility to record project/client details. The system administrator could

setup departments for each project/client in use, but this would be a messy approach requiring the intervention of the system administrator on each occasion.

If project/client details are not important in your situation then Microcomp RAMS version 5.01 is definitely worth considering. Note that version 5.00 contained some minor bugs now eliminated in 5.01. A free upgrade is available for current users of version 5.00. □

Product Details

Product: Microcomp RAMS V5.01
Distributor: BS Microcomp, 33 Pitt St, Sydney 2000 NSW
(02) 27 1122

Price: \$99 Menu system;
\$395 Hardware Security Adaptor (HSA).
A free upgrade is available to users of Version 5.00.

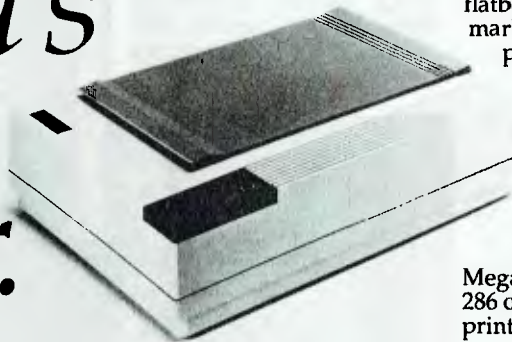
Please note: The HSA is now marketed by Hypertec Pty Ltd, (02) 819 7222, as the Hyperlock card. Any enquiries regarding the card should be directed to them.

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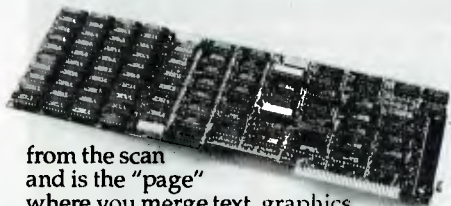
MegaScan, designed by Advanced Vision Research, is the only system that combines a flatbed scanner with interface technology and graphics manipulation software into a single, integrated solution for any application. Desktop publishing, image archiving, OCR input and more.

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MegaScan software is a single application providing scanner control, a powerful paint/pixel editor, extensive image processing, text editing, page make-up and a screen snapshot utility. Also included is a RAM disk utility so the MegaBuffer card

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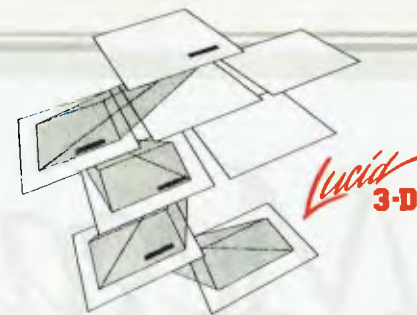
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BRISBANE	07 - 8462228
ADELAIDE	08 - 2313063
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* NOTE: President-combine MegaScan with Xerox Ventura Publisher for the "Complete Desktop Publishing System"

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Everyone says "It's the best there is."

Any cell can contain a complete other spreadsheet that you can access with a single key.



Don't take our word for it. Use Lucid 3-D for 60 days. Return it for a full refund if not completely satisfied. Plus, instead of the \$299 list price, an introductory spread-the-word price of \$199

"The Best idea I've seen for a spreadsheet in years"

Jim Seymour, Columnist, PC Magazine, PC Week

Lucid is as simple as the pictures show. And you don't have to write formulas to do that. All you do is look at the other file, navigating through easy, point and shoot directories. When you come back up (with one key) the link is made automatically for you.

Everything about Lucid works that way. Users say "It is so intuitive that I really don't need a manual." That's because we use something we call a visual command menu. Jim Seymour, the noted PC columnist, talking about Lucid in a recent article said, "If there ever was an interface idea so good it ought to be stolen and widely used, this is it."

Memory Resident

You can pop Lucid up instantly while working in your word processor or any other program. You can cut anything on the screen and paste it right into Lucid, or cut anything from a Lucid worksheet and paste into the application below. You can even run Lucid on top of 1-2-3 if you like, and cut and paste information from one to the other, including formulas.

Notepad Behind Every Cell

Another 3-D feature is that any cell can also contain a multiple page note window that you instantly access with a single keystroke. You can write notes, memos or letters that relate to your work, save them as individual files and even print them separately or with your spreadsheet.

Other Features

Lucid has over 100 innovations that cause users to say it is the best of all the spreadsheet offerings! Things like: **Speed** - background, minimal and visible recal. **Macros** - learning macros, autoexecute macros, macros work between spreadsheets, user defined macro menus. **Mouseability** - total Mac-like mouse access, but easy keyboard control as well. **Color or Mono** - 17 user controlled color displays. **Audit** - six displays and printouts. **Windows** - multiple sheets on screen at

same time. Multiple views of the same sheet. Pop-up windows of function formulas, range names, favorite labels, macro names, file-names, even a calculator. All let you select and insert right

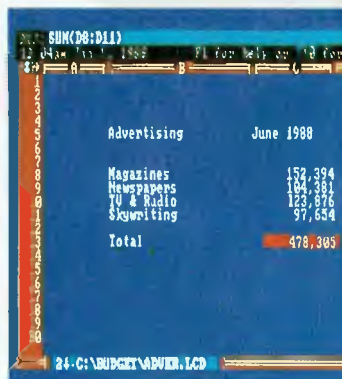


Fig. 2. Here we are instantly. Notice the lower left corner showing we are on level 2. Grey + takes you back. There is no limit to the levels you can go. Move right down to transaction level if you like.

into your spreadsheet. All windows (even notes) resize and move where you want them. Cut and Copy - between spreadsheets, documents and between sessions. Help - press F1 anywhere, you get help specific to what you are doing.

Masterwork

Lucid is more than a bag of features. It is a masterwork. The overall feel is tight and polished. In fact, Paul Somerson, executive editor of PC Magazine, used one word to describe it. "Slick".

PCSG has built an excellent reputation as a developmental laboratory. Now those who have worked with Lucid 3-D tell us "you have done it again. This is software everyone should have."

Even if you don't plan to abandon 1-2-3, Lucid makes sense. Files are converted between them with ease so there's not

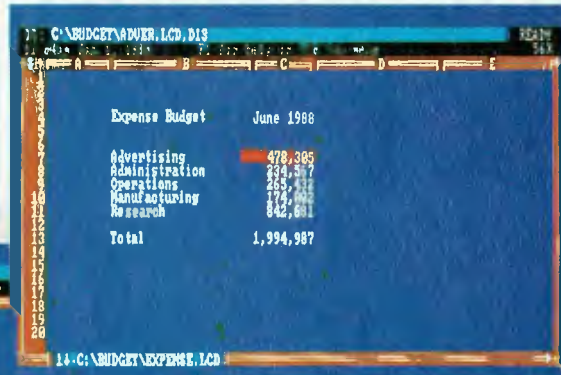


Fig. 1. Let's get the detail on those ad costs, just move the widebar to that cell and press one key (grey +).

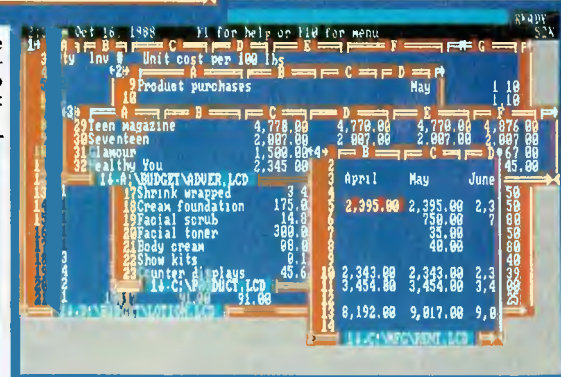


Fig. 3. Of course, Lucid does multiple windows. Notice, you can simultaneously open windows in different directories, different drives, even down as many 3-D levels as you like. No one else can do that.

an interoffice compatibility problem. This means you can have the power and fun of Lucid 3-D, without having to upset your present systems.

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Database Data

In the third part of our database survey, Steve Keen reports on two dBase clones, VP Info and DBXL, and, Silverado, a database add-in for Lotus 1-2-3.

OCCASIONALLY I envy hardware reviewers the fun of running the latest and fastest pieces of silicon on the block. But, in the past, my feelings have been quickly tempered by the knowledge that at least I will *never* have to dream up yet another way to introduce the 78th IBM PC/AT clone to hit the market this year!

No longer: my day of reckoning has arrived with the software clone. And the most cloned program of all is that database stalwart, dBase III+. This article looks at two pretenders to that tarnished throne, and one novel product, Silverado, a database add-in for Lotus 1-2-3.

The cliché that imitation is the sincerest form of flattery does not apply in the computer trade. If you are imitated, it is for either (normally both) of two reasons: your product is the market leader; or your product uses only established, easy to duplicate technology. No one has ever cloned a Rolls-Royce.

A report is set up using the builtin word processor WRITE -

```

1>WRITE b:salary.frm
B:SALARY.FRM
VP-Info WRITE
...+...1...+...2...+...3...+...4...+...5...+...6...+...7...+...
FIELDS - lname, fname, BLANK(5), dept, salary
HEADING - Last Name:-----,First Name:-----,
Department:-----,Salary:-----
TITLE - Salary Report
TITLE - For the Broomdale Store
    
```

```

1>REPORT b:salary
Friday, December 13, 1985
Page 1
    
```

Video Visions
Salary Report
For the Broomdale Store

Last Name	First Name	Department	Salary
Balzer	Joan	Sales	13440.00
Goodwin	Richard	Accounting	19500.00
Marek	Joe	Acquisitions	16450.00
Rayne Clark	Pamela	Management	21550.00
Steiner	Tom	Sales	12480.00
Wilson	Roberta	Sales	13440.00

Press any key to continue..

Figure 1. VP Info's Report command is more flexible than dBase's - information can be extracted from several related files.

When dBase II first came out on CP/M machines, it rapidly became part of the serious computer users ruling software triumvirate, with WordStar the word processor of choice and VisiCalc the spreadsheet.

VisiCalc has long since given way to Lotus, which is now facing stiff competition from Excel (while both are susceptible to the new generation of multi-dimensional 'spreadsheets'). WordStar is still around in multiple guises, but it is more an also-ran than the market leader.

Though dBase still dominates its market, most professional users have long stopped revering it. Put simply, dBase in its current form is poised to join its old companions on the software scrapheap - which is why Ashton-Tate is putting such effort into dBase IV.

dBase

The folklore is true: Wayne Ratliff, the author of dBase II, wrote it to make money out of American football pools while he was working for NASA. The analytical prerogatives of working out which NFL team was likely to win in any head to head contest shaped the design of dBase, then known as Vulcan.

Not being a football expert, Wayne quickly realised that he 'didn't know what you needed to look for in football to predict future results. Maybe what was needed was some complex relation of, say, yards passing and defense. So the database manager and analyser had to be flexible, to continually refine the things you are putting emphasis upon in your predictions. Therefore it couldn't just be a program. It had to be some sort of system which would just let you say things, so that led to the English language interface of dBase.'

King of the mountain

There is no disputing the fact that when it first appeared, dBase was a deserved hit: it annihilated anything else on the market. Most of its competitors were single file programs only; dBase allowed you to open two files at once. Its English-like interface allowed you to use statements like 'List Product where Cost 1000' and get a sensible answer, which was very seductive compared to

Databases

In the July issue, we covered four low-priced databases: Memory Mate, Q&A, Reflex and Dac Easy Base; the August issue had Enable, Open Access, Smart and Ability Plus - all part of integrated suites - and RapidFile, a single file database, and AskSam (a database with a difference).

In the next part of the series, Steve Keen will report on direct competitors to dBase: Paradox 386, Meta5, Dataease, ZIM and Focus. It's a prelude to this year's computer software heavyweight title bout, when dBase IV finally emerges from its cocoon.

```

1>BOX 5,25,22,65 DOUBLE
1>@ 6,26 SAY "These are examples of fixed commands"

1>WINDOW 10,15
1>CURSOR 11,5
1>ERASE 19,20

1>
    
```

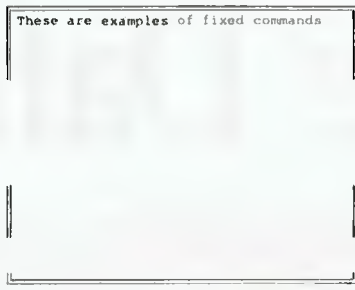


Figure 2. The Windows feature of VPI can be used to overlay (rather than cover) a menu with a message or data entry form. A window can also be created to show the contents of one database file while editing another.

the gibberish some interactive rivals required of yore. It was 'relational', in that you could link two files using indexed fields and its programming language.

Before dBase, anyone with a need for a serious business micro-computer database had it written in Basic or the like. dBase spawned an industry of programmers who relied on dBase to provide the file structures and indexes, and wrote their applications in the far clearer dBase code. The programming language itself was (and remains) exemplary. It used structured programming techniques, with the program broken down into purpose specific modules, at a time when most users were still writing 'spaghetti code' Basic programs, where line numbers controlled the sequence of execution. dBase instead would execute every line in sequence in a PRG file, with DO While... END While constructs controlling looping, IF..Else..Endifs controlling conditional branching, and the Case..Endcase construct controlling multiple choice menus and the like.

dBase has been enhanced twice since then, once to exploit the IBM PC's performance advantages over the Z80 based CP/M environment with dBase III, and a second time to offer networking with dBase III+. Bill Bolton (then with Ashton-Tate) launched the last revision with the statement that 'dBase was the standard in databases, and dBase III+ raises the standard.'

VP Info

VPI belongs in the partial clone category; there are enough differences between it and dBase to mean that any dBase program will need to be edited before it can be run. However it does offer a number of advantages over dBase, particularly in the user interface and performance areas.

Like DAC Easy Base, VP Info was based on dBase II rather than dBase III. Unlike the DAC product, VP Info has been enhanced to compete with dBase III+, but the product has not kept simple step with dBase. While they are highly compatible, there are many areas where the two programs differ, with each occasionally having the upper hand.

Disadvantages

dBase is ahead in muscle: 2 billion records in 10 databases versus a maximum of 65,000 records per file in 6 databases,

though as VP Info's manual points out, few micro applications have a need for more than 65,000 entries.

VPI does not support a date data type; instead you have to use character strings, and store dates in 'yymmdd' format. It does have date manipulation functions, but this is poor compensation since a date data type simplifies programming.

VP Info's main deficiency is the manner in which different files in use are selected. There are two initial steps to using multiple files in dBase. SELECTing a work area (from 1 to 10 in dBase, 1 to 6 in VPI); then USEing a file within that work area.

From then on dBase lets you select files by referring to the file names (or aliases), as in 'SELECT Customer' VPI continues the dBase II practice, of selecting work areas by number - as in 'SELECT 3'. No prizes for guessing which method makes debugging program code easier.

Advantages

VPI's Report command is much more flexible and full-featured than dBase's. The Report command in dBase limits you to reporting from one file only. With VPI you can extract information from several related files.

Its approach is quite different to that of dBase, where you physically lay fields out on screen. Instead you create a text file using the builtin word processor WRITE, containing commands for REPORT to execute.

VPI's approach sounds more complex, but because the commands are non-procedural, it isn't. A simple report giving a columnar listing of fields can be prepared with the line 'Fields - fname, lname, dept, income'. English language headings can be provided for the fields with the line 'Heading - First Name, Surname, Department, Yearly Salary'. The keyword TITLE generates a centred heading, as many lines long as you want; SUBTOTAL, along with a PICTURE statement to show the numeric format you want, gives you subtotals for a sorted or indexed database.

The linking of multiple files for a relational report is achieved using the FILE and RELATION commands. Each use of 'File - Depts, File - Emps' loads the specified file into the next file area, while RELATION links the first file to the others, using related fields. For example, the commands: 'FILE - dept FILE - employee RELATION - deptnum TO 2' load the Department and employee files, putting Dept in area one, and links them through the common field DEPTNUM. It is the report equivalent of the SET RELATION TO command that you can use in general dBase programming.

Were it not for the relational weaknesses of dBase (and its clones), you could then produce a report listing the departments with their employees, extracting the latter information from the employee database; or you could pull in total salaries, and so on. Instead, because SET RELATION TO only finds the first matching record in a database, you can only extract information from the first record in the second database.

For example, say you have a sales department with seven employees. If you used the above commands, and then attempted to list departments and employees, VPI's report would show only the first employee. To get a complete listing of all employees, you still need to write a PRG file with all the procedural commands (store dept to mdept, Select Employee - or Select 2 in VPI - DO WHILE dept = mdept, SKIP, and so on) needed to sequentially process matching records in two files.

Hence, though VPI's report module promises much more than dBase's, the fact that VPI clones the weaknesses as well as the strengths of dBase means that it is only marginally superior.

Editor and programming constructs

VPI's editor has a few useful commands that are not available in dBase's modify. One is Alt-F, which indents a line (a vital visual guide in structured programming) and automatically capitalises any keyword that begins a line. However, generally it performs sluggishly, and its programming aides are not in the same league as those of, say, Borland's editor in Turbo Pascal.

To 'Do While', VPI adds 'Repeat-Endrepeat'. This is a multiple execution command, which will repeat a series of commands a specified number of times depending upon a condition – which would normally be based on your data. It can take the place of Do While loops and obviate the need for error checking code.

Perhaps the best innovation in VPI is its extension of the TEXT...ENDTEXT construct. In addition to displaying text as typed by the programmer (for menus and the suchlike), VPI's text can show the content of variables and so on.

This circumvents one of the most annoying deficiencies of dBase III – the absence of a decent screen painting facility (one exists, but it restricts you to displaying the fields from one database only. A far better utility was available for dBase II.). With VPI, you can layout a screen exactly as you want it to appear in a word processor, with ampersands preceding the name of memory variables that you want filled at runtime. For example, the text &mdate would be replaced with 'August 8th, 1988', the contents of the memory variable mdate.

VPI also offers Windows, which can be used to overlay menus with data entry forms, rather than covering the menu, or to display the contents of one database while a related one is being updated. Unfortunately the windowing commands are not fully integrated with the @ SAY . GET commands. Cursor coordinates in those commands still reference the entire screen, not just the window itself. The lines: Window 10,10,15,40 @ 1,1 say 'Hi there!' should define a window 5 lines high starting on row 10, and then place the words 'Hi there!' in its top left hand corner. It does the first half, but not the second; the words actually appear at row 1, column 1 of the full screen. Thus, if you intend placing text within a window using @ SAY, GET commands, you have to know the precise relative location of the window. This is cumbersome, which DBXL's far more integrated method illustrates.

Additional commands include POST for totaling to a separate database; ONFIELD.. ENDON for error checking and processing specific to each field in a form; a :KEY function to tell which key a user pressed (allows use of non-standard selection keys, e.g. END); an ON ESCAPE .. ENDON function to allow use of escape key without crashing back to the program prompt; and CHAIN and PERFORM as means of calling procedures and separate programs as well as DO, with differing effects at compilation.

Manual and example

In a boost to all those small businesses running video shops, the program comes with a complete video management system as an example application on disk. It is the example referred to throughout in the manual, which is significantly better than dBase's own manual.

The original dBase II manuals were excellent. The first volume gave you a tutorial introduction to programming in dBase which taught the basics of structured programming as well as dBase's own code, while the reference section was comprehensive and readable. dBase III+'s manuals were a big step back from that standard.

Finally, VP Info is actually a pseudo-compiler, rather than an in-

```

..DBXL CREATE
Define      Edit #      Top      Bottom Save Abandon
Define fields for this database.
-----
Database:  CUSTOMER.DBF                               Bytes left: 4000
Name      Type      Length Dec      Name      Type      Length Dec
-----
1          Character
-----
CREATE      <C: >
Enter name for field. Press      when finished adding fields.

```

Figure 3. DBXL's menu-driven system is easier than dBase III+'s for novices to use when creating and appending a database file, but its report facility isn't as good.

terpreter as is dBase. This means that it reads and parses an entire command file before it does anything, unlike dBase which executes line by line.

As a result VPI is much faster on processor intensive and repeating activities, since all the instructions are stored in RAM as pseudo machine code. The reason for only compiling to a pseudo-code is that it is able to execute macros – something you can't do with freestanding compilers.

Once debugged, the whole application can be compiled to pseudo-code, which allows still faster execution. Pantek sell a runtime package (untested) to allow developers to distribute their VPI applications cheaply.

Conclusion

VP Info is not for the user who wants to get multiple copies of dBase at a cheaper price (though it does support networking). There are sufficient differences between it and dBase to ensure that any current dBase program will need to be rewritten to run under it.

It is definitely a goer for the home user or small business (or even a medium business with a network) who wants to avoid the expense of dBase, and will write or have written a specific application. Except for the need to refer to work areas by number, it is significantly easier to program in than dBase, and close enough a dialect for any experienced programmer to begin exploiting its novel features in a day or two.

If you're in the market for a menu driven database as well as a relational one, look to DBXL instead; VP Info doesn't have a menu driven interface.

DBXL

Except for the glaring omission of networking support (though the read.me file claims that the next release will offer it), DBXL is a much truer clone than VP Info. It ran a quite complex dBase application (four databases with two indexes each, and a procedure file with 32 modules) with no hitches at all. It is an immediate candidate for transferring from dBase to a clone, whereas VPI is not.

It also comes closer in the sheer power area, with support for 10 databases of 1 billion records each, and it outdoes dBase by allowing as many as 240 open files at once (overkill, of course – any micro with that many open files would have a seizure). It is more memory hungry than dBase, needing 512 kilobytes of RAM, with at least 402 Kbyte free.

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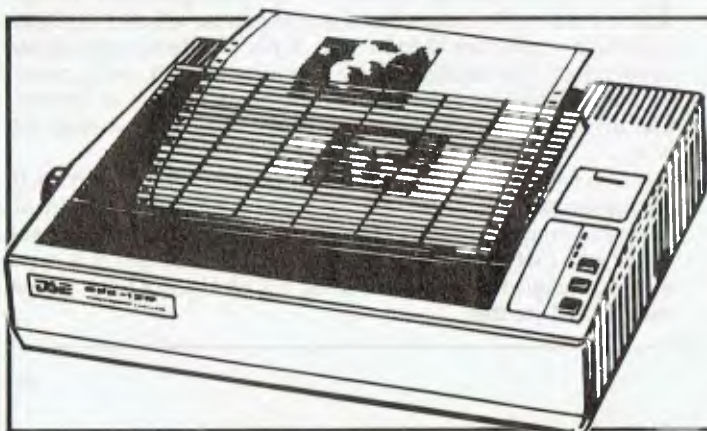
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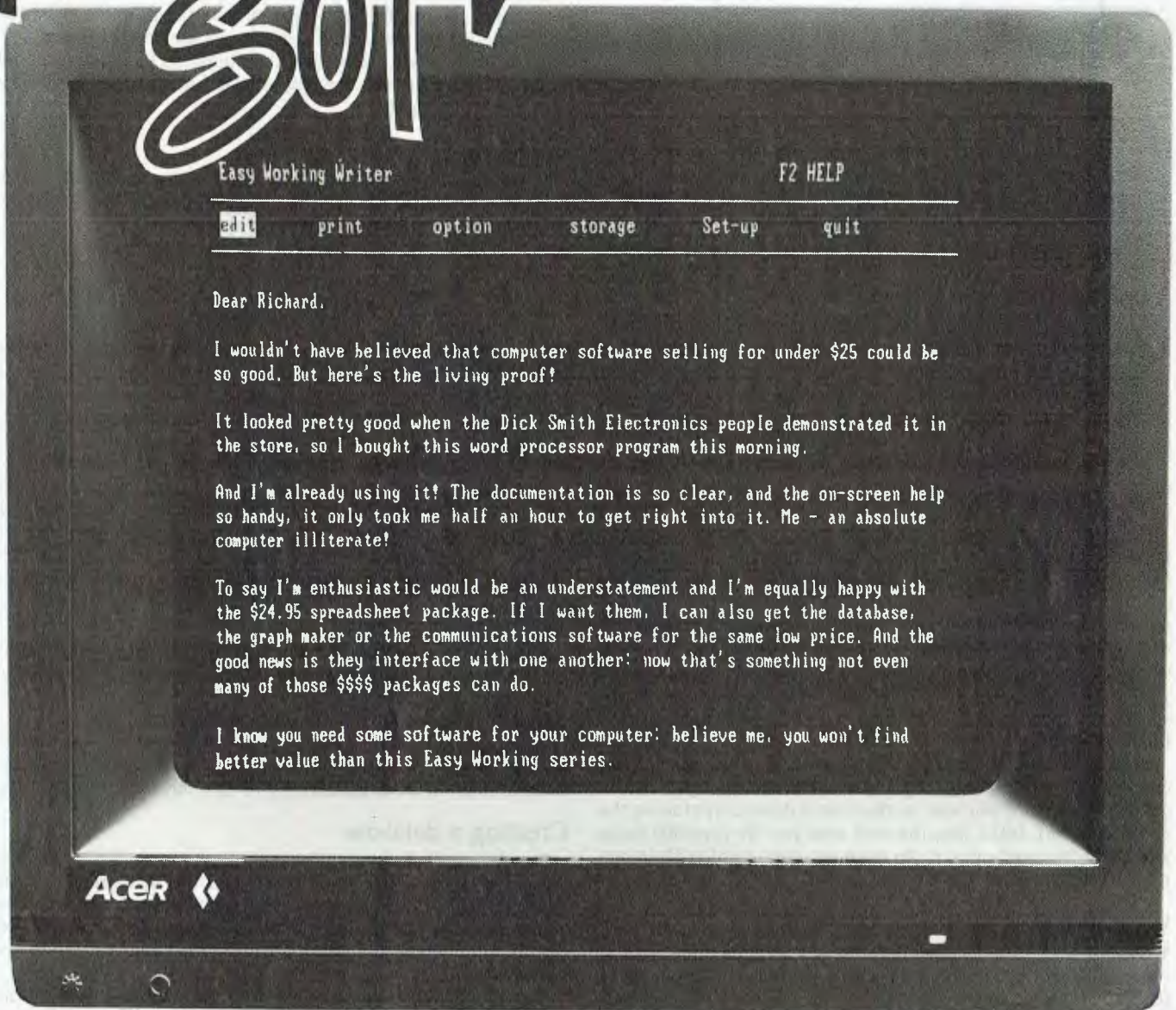


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edit print option storage Set-up quit

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DATABASES

D15: (D1) (W10) 30839 SILVR

A	B	C	D	E	F	G	H
1	Name	Office	Founded	Mgr	ID		
2	South	Atlanta	27-May-84		584		
3	West	San Diego	29-Feb-84		340		
4	Midwest	Chicago	06-Aug-84		112		
5	East	Boston	06-Jun-84		399		
6	Europe	Bonn	25-Jan-85		877		
7	Mid East	Riyadh	05-Jun-85		944		
8	Orient	Tokyo	29-Mar-85		740		
9	S America	Rio	15-Oct-85		266		

Name	Office	Founded	Mgr	ID
East	Boston	06-Jun-84		399
Europe	Bonn	25-Jan-85		877
Mid East	Riyadh	05-Jun-85		944
Orient	Tokyo	29-Mar-85		740

Figure 4. A Lotus 1-2-3 spreadsheet with a Silverado window – data can be extracted from 1-2-3 and read directly into the Silverado database where it remains interactive with the original (as data is altered in Silverado, the changes are also made in 1-2-3).

Advantages

DBXL's Intro is superior to dBase's Assist. Intro supports 'first letter' selection of options; dBase makes you use the cursor keys to select an option, and then press return. Intro's menu choices are also clearer and better organised. For example, if you want to produce a report using Assist, the main menu gives you no idea of what to do – it makes no reference to Report.

However, there are areas where the original is better. For example, Intro lets you only load one index per database; Assist allows multiple indexes.

Generally, DBXL beats dBase at all menu-driven levels, which includes activities such as creating a file, where novice and expert users alike must use the menu. However DBXL's report definition facility is poor compared to dBase. With dBase, as you define the report a mock-up is displayed. DBXL simply shows a general format report, which is not altered as your report is defined. Also, when you are entering field names for the report, dBase prompts you with a pop-up window of available fields; despite its emphasis upon windows and pop-up file lists elsewhere in the program, DBXL doesn't.

DBXL's interactive interface is also more informative than dBase's dot. With dBase, all you get is the dot (though you can get the menu bar if you wish, at the cost of drastically slowing the program down). DBXL lists the work area you are currently in, as well as the file resident in it. No more wondering which file is currently selected.

Windowing

VPI's windows offer more user interface features than DBXL's, but DBXL's windows are better integrated into the program than VPI's. Their usage mirrors that of database files themselves: a window area (from 1 to 99) must first be SELECTed, then a named window USED inside it. After a window is opened, all screen coordinates are relative to its top left hand corner, which greatly simplifies screen design. The comparable commands for DBXL involve more code than for VPI, but they evoke the correct effect. The commands – wset window words to 10,10,15,40 wselect 1 wuse words @ 1,1 say 'Hi there!' – locate a 5 line by 30 character window at row 10, column 10, and projects the words 'Hi

there!' into its top left hand corner. You can thus comfortably use DBXL's windows for screen design, and move them, resize and so on, as you desire.

Apart from windows, Automem is DBXL's main innovation. A frequent task in dBase programming is to create memory variables to store user input, and then replace entries in a blank database record with them. With dBase you have to create memory variables one at a time, one for each field in the database, then REPLACE each field in the record with the relevant memory variable.

DBXL includes the ability to create a graph from database data. The graphs are slightly better quality than Lotus, and are limited to 20 data points. The graph options include scatter and regression plots, which are useful analytic extensions to a database; but they hardly rate against the graphing and analytic powers of, for example, Statgraphics.

Conclusion

DBXL is a better bet for the user who wants a cheap alternative to dBase, with the twist that it doesn't support networking – so it is not a goer for the multi-user market.

Silverado

Few carpenters would attempt to drive a nail with a chisel. Numerous software users attempt that feat every day – using Lotus 1-2-3 to manipulate a database. The database powers of 1-2-3 are not among its strong points: the database operations are limited, the commands to execute them awkward, the reports from them meagre. A database query, for example, requires you to create a mini table containing the field names and entries you are looking for, and designate this a criterion range; create a duplicate of the field names you wish to extract, and designate this an output range; then tell 1-2-3 to Extract the matching records. This creates a duplicate of part of your database, within the same spreadsheet. It has to be repeated for each different grouping of data you are interested in.

Silverado is attached to 1-2-3 as an add-in, which you install using the add-in manager. Once installed, it can be invoked by pressing an Alt key combination. Silverado then takes over 1-2-3 completely, replacing 1-2-3's menu with its own.

Since the Silverado database is stored separately and can be accessed from any spreadsheet, it can act as a central repository of data, with 1-2-3 being restricted to its intended role – analysis.

Creating a database

Creating a database involves selecting a range for its display. Unlike 1-2-3, where you have to mark the entire region where data is stored, with Silverado you specify a viewing 'window'. The actual database can be much wider and deeper than the window, in which case you must scroll sideways and page through to see all the records.

The data is also stored in a separate file on disk. It is therefore not subject to the RAM limitations which inhibit 1-2-3 'databases', nor to the number of records limitation.

You can get your data into Silverado by either typing it in, or reading it in from a range in the 1-2-3 worksheet in which it was invoked, from a worksheet stored on disk, from a text or dBase III file. The operations are easy to execute, and once carried out they create a totally separate file to your source spreadsheet or database – which is therefore best deleted, to avoid confusion.

Views

By default, the data is displayed in a typical spreadsheet rows and columns view, with the whole display boxed and the field names 'pigeon-holed'. Two other 'views' (*a la* Reflex) are offered: form and cross-tabulation.

The form view is useful for record entry and for reviewing individual records in their entirety, but it's a pity that the author did not make it possible to see a form view and a spreadsheet view simultaneously — which is possible in Reflex.

The cross-tabulation view is a very useful tool for data analysis. A university department could use it to see how student's exam results vary by student's entrance marks and tutor; an insurance company to see how sales vary by salesperson and type of policy and so on.

Form view is 'created' simply by selecting it from the main menu 'View' option. A crosstab requires slightly more work: you must choose the object being diagnosed (for example, sales), and the two variables whose effect on it is to be discovered (for example, salesperson and advertising outlays), and the type of data you want — sum, average and so on.

This was one of the most useful elements of Reflex, and in many ways having it within 1-2-3 is better than having the power split between two programs.

Reports

Silverado reports appear within the range from which they are derived, not as a separate enclave within the spreadsheet, as with 1-2-3. The database must be sorted or indexed as a prelude to creating a report. Rather than being restricted to two sort fields, you can sort by as many fields as you have in the database.

Say you have a retail business with several stores, several product lines, and several salespeople in each store, and you wish to report sales by product, store and salesperson. After sorting the database in that order, you would move to the sales field, and nominate that you wanted a report showing the sum by salesperson, the last of your three sort fields. Silverado quickly generates a report showing subtotals for each of product, store, and salespersons — a three level report generated with three keystrokes.

The report options in addition to sum include count, average, ranges and weighted averages. The default format of an underscore before each subtotal figure can be altered to allow single or double underscores or overscores, blank lines before or after, and to suppress repeats of a value (for example, a salesperson's name for each sale), showing the value only when it changes.

A novel touch is the outliner. The above report has three levels of detail: product, store, and salesperson, as well as one record for each store. Pressing the 'less-detail' key (F4) once hides each individual sale from view; twice removes the salesperson figures, leaving just store and product totals; a third time leaves only product totals; a fourth shows just total sales. This is the nearest thing to getting 'multi-dimensional' power that I have seen for a spreadsheet.

Reports can calculate summary percentages, running totals, and differences between one record and the next, generating new fields in the process.

In addition to the tabular reports that are the limit of 1-2-3's report-making facilities, Silverado can also print form oriented reports and mailing labels, using the form view of your database. Mailing labels are designed on the third 'page' of the form view by inserting the required fields wherever you want them. The program can handle two and three across labels with ease.



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DATABASES

Multifile operations

Silverado fits into the 'static relational' category. It won't let you link two files while entering data (so that an invoice file will look up product price details from a product database, for example). But it will allow you to selectively join the data in two files after the event.

The five multi-file operations supported by Silverado are Join, Append, Project, Select and Total. Project lets you export specified fields, while select exports only records which meet the search criteria. Append adds records from one database to another.

The most useful multi-file command is Join, which creates a third file out of matching records in a primary and secondary file. This is one way of creating an invoicing file from a customer file and an orders file, for example.

Silverado performs the join using either fields which have the same name, or fields which you place in the same column of the spreadsheet (in different database windows, of course). Three kinds of join are possible: first record match only, which creates one record in the joined database for each record in the primary file; all record match, which you would use in the above example to create an invoices file with one record for each purchase by each customer; and summary, which pulls in total information for each primary file record from the secondary file – the value of all purchases by each customer, for example.

While it lacks dynamic relational features, Silverado can at least perform range checking on inputs, using the Search criteria as a filter to disallow data entries outside the criteria range. For example, in an address database, you could disallow postcodes of less than 2000.

Lotus macros can now activate an add-in, such as Silverado. The macro commands, after Silverado has been invoked, relate to Silverado's menus rather than 1-2-3's. This allows you to automate a host of database activities – such as preparing and printing reports – and to pass control from Silverado to 1-2-3 whenever its analytic powers are more appropriate.

Conclusion

Silverado is an ideal depository for corporate data, with the spreadsheets used only for analysis. It overcomes the problem of not knowing whose spreadsheet has the most up to date figures.

It also provides the best features of Reflex, from within 1-2-3, at a comparable price. Given the weakness of 1-2-3 as a database tool, I'd regard it as a must for any heavy 1-2-3 user. □

Product Details

Product: VP Info

From: Pantek, 376 Lane Cove Road, North Ryde 2113 NSW;
Phone (02) 887 9444

Price: \$250 taxed

Product: DBXL

From: Micro Database Management Systems,
Suite 6, 16A The Boulevard, Strathfield 2135 NSW;
(02) 745 1995 or 745 1677

Price: \$349 taxed

Product: Silverado

From: Micro Australia, 15 MacDonald St, Mortlake 2137 NSW

Price: \$229 untaxed

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SoftPC

I RECENTLY had the opportunity to have an extended 'play' with the new Macintosh II computer. The machine that I was examining had 5 megabytes of memory, the standard 3 1/2 inch, 800 kilobyte microfloppy, a 40 Mbyte hard disk and SoftPC (amongst other goodies). I have been using an AT clone for over three years now (I do all of my technical writing on it) and am quite familiar with MS-DOS and all its little quirks. I now had the opportunity to evaluate a complete software emulator of an 8088/8086, running on the Macintosh II.

The package is called SoftPC and is designed to allow MS-DOS (and therefore PC-DOS) programs to run on the Mac. The version of DOS supported is the very latest, DOS 3.3, and GW-Basic (Version 3.22) is supplied as part of the system.

To use the program, you'll need a Macintosh II with a 20 Mbyte hard disk (SoftPC requires 2 Mbyte of hard disk space) and at least 2 Mbyte of RAM. You'll also need System 5.0 and Finder 6.0 (MultiFinder is supported).

There are two methods of accessing your PC files — either you can make (or buy) a serial cable to connect the Mac to a PC and download the software to the Mac's hard disk, using appropriate driver software at each end (Appendix F in the SoftPC manual describes quite clearly how to accomplish this); or, you can buy an external IBM compatible 5 1/4 inch drive from either Apple or a third party supplier and transfer software (or run it) from this drive.

The machine that I used had an Apple external drive configured as A, and this made the execution and transfer of DOS files fairly trivial. Potential users should note that the Mac's 3 1/2 inch drive is *not* available for PC applications. As the Mac II has none of the standard parallel and serial ports, the software emulates these to re-direct output to the appropriate Mac I/O port. Once again, the manual gives quite detailed and clear instructions on how this can be done.

Roy Hill has been enjoying the best of both worlds — running DOS applications on a Mac II.



Emulation

There are two ways a successful emulation can be performed. One way is to build a hardware type card that is plugged into one of the free slots on your computer. This card has the foreign processor, RAM, video drivers and so on, all built onto the card. In most cases, these cards take over the Bus of the computer and use the host's disk drives, I/O ports and monitor for the necessary features. (The CP/M card for the old Apple II was an example of this type of card.) The problem with this type of emulation is that if the host's I/O routines are slow (or depend on a slow processor), then everything will be slowed up by the I/O.

The other way is to use software to emulate the processor. This means writing an extremely clever program that traps *each and every* instruction being sent by the application program and translating it into the language of the host processor. To do this successfully requires a fairly

fast processor (which is, in effect, doing the work of two processors) to handle the translation process. The 68020 processor is quite fast, thank you, and quite capable of handling the demands of emulating an 8088 at 4.77 MHz.

SoftPC uses the second of these two methods to emulate the Intel 8088 as used in the IBM PC and XT. Obviously, all of the calls to the IBM BIOS (the firmware chip that provides many of the I/O drivers for the PC) are also trapped and emulated. This is where the only real problem that I found with the program occurred.

A little background here might also help. When IBM developed the PC, they decided to follow existing convention, which said 'most of the processing power of a microprocessor is wasted waiting for users to type things in, so we might as well use this processing power to do all of the other housekeeping tasks like handling keyboard, disk, serial and parallel port and screen I/O.'

This makes for a fairly busy little processor, as you may well imagine, and even early software programmers for the IBM tried several tricks to allow the screen I/O to take place faster. Of course, such tricks as writing directly to the video portion of RAM (instead of using the normal, slow BIOS routine), isn't possible in software emulation, as the video RAM just ain't there.

When a company decides to manufacture a software emulator to work like an IBM PC or XT, then it must also emulate all of the design faults as well.

The package comes with three 3 1/2 inch Macintosh format disks, containing the SoftPC program and a fairly comprehensive manual. The hard disk on the Mac has three different drives available to it: C, D and E. Drives C and D must be partitioned and formatted using the normal DOS FDISK and FORMAT commands (all supplied as part of the system) and drive E contains Mac files, or files that you wish to transfer to Mac applications. The SoftPC drivers are installed on Drive E. You may

boot the program from either the hard drive, or from a floppy in the A drive.

I tested a whole range of programs under SoftPC. No, I didn't try Flight Simulator for two reasons – one, I don't have a copy of it, and two, it really doesn't measure compatibility – I know of several incompatible clones that were optimised to run FS, but they ran very little else.

The programs I ran are those that are intended to give a fair overall concept of the performance of SoftPC. Fantasy (a CGA graphics program), Multiplan, WordStar, Pathfinder, PC Paint, Norton's Utilities and even Norton's DOS Editor ran perfectly. The only program I could find that wouldn't work (and I didn't really expect it to) was the PolyBoost program which was designed to increase disk, screen and keyboard performance, by installing appropriate buffers and caches.

The most surprising results that Norton's SysInfo gave (see Figure 1) are those for the main processor (it found an NEC V20) and the Computing Index, which returned a value of 1.7. The NEC V20 Main Processor finding is a little surprising, as there is no processor there at all, just a computer program. It would appear as though Insignia Corporation (the makers of SoftPC) have done some sort of cross licensing agreement with NEC. The Computing Index shows up just how appallingly slow the IBM video driver really is.

I decided to run an objective comparison of the screen refresh, compared to a stock standard IBM PC. I loaded WordStar and the same document onto both systems and timed how long it took to scroll one page. For the PC, it took an average of 2.4 seconds if disk access was involved, and an average of 1.1 seconds with no disk access. For SoftPC, the figures were 2.51 and 1.80 seconds respectively. The first number is enhanced by the slightly faster disk access of SoftPC, whilst the second is a true example of the slow screen updating under optimum configuration.

I ran PC Magazine's Benchmarks (I got them from Kevin Mann's Central Coast Bulletin Board as PCBENCH.ARC, (043) 232275) on SoftPC and on a standard PC (so that times could be included). The results are shown in Figure 2.

The Macintosh was supplied to me with a mouse and Insignia Corporation provide a driver to get it to work under MS-DOS. This is a particularly convenient feature, as the driver makes the mouse MS-Mouse compatible. Prior to using the mouse, one has to pull down an appropriate SoftPC menu and 'Attach the Mouse' to SoftPC. Using appropriate file exchange software,

	Processor Speed Test (in seconds)	
	Standard PC	SoftPC
NO-OP Loop	9.59	11.04
Do-Nothing Loop	9.89	10.00
Integer Add	9.88	9.01
Integer Multiply	10.00	6.97
String Sort	10.87	13.02
Eratosthenes Sieve	15.05	18.01

	Instruction Mix - Processor Speed Test	
	Standard PC	SoftPC
8086/8088 Test	32.41	32.02

	GWBASIC (V3.1) Interpreter Tests	
	Standard PC	SoftPC
Integer Add #1	0.49	1.22
Integer Add #2	0.39	1.10
Floating Point	1.48	3.03
String Concatenation	1.34	2.57
Data Look-up	2.11	3.58
Empty Loop	0.09	0.17
File Update	5.23	5:35

	Disk Access Time Test on 5.25" Drives	
	Standard PC	SoftPC
Read 1000	300.12 msec	280.01
Random Sectors (Time/Sector Read)		

Figure 1. The PC Magazine Benchmarks show that whilst SoftPC is comparable to a 4.77 MHz PC in direct processor speeds and disk access, the screen handling routines really drag the speed down, even with the Mac emulating a 2 colour B&W monitor.

one can do some word processing on a PC portable using MS Word (for example), copy it onto a 5¼ inch disk and then transfer it onto the Mac using one of the Apple File Exchange programs and put it out on a Laserwriter. Very useful.

Printing

If you have a LaserWriter (or similar laser printer) attached to your Mac, you can drive it directly from any application that uses PostScript drivers. If your application doesn't support PostScript (or a LaserWriter, or compatible printer), then don't despair. SoftPC provides an Epson emulator (an FX80 driver) that can enable printing to be done on the LaserWriter. Of course, the PostScript controls will not be there and you will be stuck with the one font, but it is quite acceptable printout. I had the Apple Mac networked to a PS/2-30 and I dumped part of a document (written in Word 3.0) to an ASCII file and then used the PC-DOS 3.3 PRINT command to drop the file to the LaserWriter. The output was quite acceptable. I also used WordStar V3.3 to dump part of this article to the LaserWriter. The procedure this time was slightly different, as I had to use the Flush Printer command on the SoftPC menu to

'push' the document out of the LaserWriter (WordStar doesn't send an End-Of-File mark to a printer and the LaserWriter likes to get one).

The other test I made was to drop some graphics (using Fantasy – see *Your Computer*, December '87) across to the LaserWriter, using the Epson FX driver on Fantasy to drive the emulator on the LaserWriter. Unfortunately, it didn't work. I feel sure that these small problems will be fixed in the release version. The standard IBM PRINt Screen routine worked perfectly, provided you remember to Flush the Printer after each dump.

If you are in the market for a Macintosh II and you want the best of both worlds, then spend an extra few dollars and get SoftPC. To obtain the best performance of screen refreshing, it would be advisable to set the Macintosh monitor to two-colour B&W (no shades of grey) and to remove any other interception programs like QuickKeys from the System Folder. You can, of course, run the SoftPC under colour if you wish. As a final note, I enjoyed the irony of running PCPaint (an IBM take-off of MacPaint) under MS-DOS emulation on the Mac II (there has to be some sort of message there!). □

The Acer 500+ Series II

Over the years, the Dick Smith organisation has had many a stake in microcomputers. Its latest offering is the Acer 500+ Series II, an IBM compatible that comes in three attractive configurations. Its price is highly competitive with the cheapest units available from many other companies.

It is particularly good value when considering its performance, that it comes with excellent video and monitor *and* that it is bundled with DOS, Basic and good manuals. The Acer is an easy machine to recommend to anyone buying their first computer, and needing a serious micro-computer on a limited budget.

The Acer is IBM compatible, and has a NEC V20 processor running at 4.77 or 8 MHz. As mentioned, it comes in three configurations. The System 1 has 256 kilobytes of memory and a single half height floppy drive. The System 2 has 640 Kbyte of memory and two half height drives, while the System 3 has 640 Kbyte, a single half height floppy and a half height 20 megabyte hard disk. All have one serial port, one parallel port, a games port and a clock/calendar. All include a paper white monitor compatible with the IBM mono display adapter and Hercules boards. The video board can be switched for Hercules monitors or CGA colour monitors, and also offers an emulation mode that allows CGA software to run on a Hercules compatible monitor.

The Acer is a very neat and compact unit. At 380 x 390 x 120 mm, it is far smaller than most clones and similar in size to a PS/2 Model 30. Looking at the front, the disk drives can be seen one above the other just a little to the right of centre. Little else is visible on the front except for nameplates and an indicator light which is on when running at 8 MHz and off at 4.77 MHz. On the rear panel can be seen the power switch, power inlet socket, power outlet socket for monitors, fan, games port and the rear of four expansion

John Hepworth thought that DSE's Acer 500+ Series II had so much to offer, he recommended it to a friend (who promptly went out and bought one!).

slots. The slots are horizontal, and are one above the other, rather than the more conventional vertical slots one beside the other.

On the rear cover of the bottom slot are a connector for the parallel port, a switch to select the video for a mono or colour monitor and the keyboard connector. On the rear of the next slot up is a 9-pin serial port, a 9-pin video connector, and a coaxial video connector. Nothing is visible on

Switching Hercules modes from Basic

Most software written for Hercules is able to switch the video modes as required, but some (like Lotus 1A) does not, and a utility program is required. While such a program comes with genuine Hercules boards, one is not included with the Acer - but these will do the trick:

Switching to text mode only -

```
10 OUT &H3BF,0
20 SYSTEM
```

Switching to text and 64 Kbyte graphics -

```
10 OUT &H3BF,1
20 SYSTEM
```

Switching to text and 32 Kbyte graphics -

```
10 OUT &H3BF,3
20 SYSTEM
```

the rear panel of the top two slots. There is a reason for the ports to be as they are, and all is revealed by taking off the cover. Merely removing three screws around the edge of the rear panel allows the cover to be pulled back and lifted up.

Inside look

Opening up an Acer brings a surprise. No motherboard can be seen, because there isn't one! Immediately to the left of the drive bays is a vertical printed circuit board, with four conventional expansion slot connectors one above the other on it. No electronic components are visible as this slot board is not the motherboard and does not contain the CPU.

An expansion board carrying the NEC V20 CPU is in the bottom slot. In the next slot up is a VIO board. This is a combination board with video, floppy controller, clock/calendar, serial port, parallel port and games port all on it.

The next slot contains the hard disk controller, if any, while the top slot is empty. All memory is on the CPU board, with the first 256 Kbyte being soldered in and the rest being in sockets. In the case of the System 1, which has 256 Kbyte, the sockets are there waiting for the user to add the extra memory. All the boards are very well supported, at the front of the machine as well as at the rear. In addition, another support midway along the boards ensures that they won't flex unexpectedly.

The floppy drives are also mounted in a slightly unconventional manner. Instead of being slid into a rack from the front and then screwed down to secure them, they are fitted into a cradle, which is then lowered into the machine. The drives are quite standard, however, both electronically and in their physical construction, right down to using standard mounting holes.

To the right of the drives is the power supply, running from the very front of the machine to the rear. It is very compact,

and is only about 40 mm wide. The fan is not built into the power supply but is mounted directly on the back panel.

Video and monitor

The video board is rather special. It can emulate either a Hercules board or a CGA board, and can be switched from one to the other via a switch on the back panel or via a utility program which comes with the machine. Naturally the monitor must be swapped from a Hercules compatible TTL mono to a colour monitor, or the reverse, to suit.

Want to run CGA software on the TTL monitor? No problem, the same utility program can switch the video board to an emulation mode where it appears like a CGA to the software, translates as required, and then drives the TTL mono monitor. It even can cope with self booting games.

There is one minor omission in the video utility software. Hercules and compatible video boards use varying amounts of video memory according to the desired graphics modes. They are switched into these modes with software. They need the least amount of memory for text only, with no graphics possible. For text and graphics they need either 32 Kbyte or 62 Kbyte of video memory. Most software written for Hercules is able to switch the video modes as required, but some like Lotus 1A does not, and a utility program for the purpose is required.

Such a program is HGC.EXE which comes with genuine Hercules boards, and switches the board to text with HGC DIAG, to 32 Kbyte with HGC HALF and to 64 Kbyte with HGC FULL. No such program comes with the Acer, but never mind, you can do it with Basic using the little programs I have included in the accompanying box.

The standard monitor is simply outstanding. It has a Dick Smith part number X2400, made by Acer as the MM-211. The screen has a white phosphor in lieu of the more common green or amber. It is far more restful on the eyes than almost any other monitor I have ever used, particularly when used with software that has dark text on a light background, such as Microsoft Windows. It is very sharp and easy to work with, hour after hour. A swivel and tilt base is built in, and controls at the bottom right of the screen allow adjustment of contrast and brightness and power on/off. It is excellent except in an extremely bright room like a sunroom, and even there it is acceptable when run on maximum brightness.



Figure 1. The Acer 500+ comes in three configurations. Standard with all three are one serial port, one parallel port, a games port and a clock/calendar. All include a paper white monitor compatible with the IBM mono display adapter and Hercules boards. The video board can be switched for Hercules monitors or CGA colour monitors.

Keyboard

The keyboard has a familiar layout, closely paralleling the original IBM PC keyboard, but with some variations. The ten function keys are arranged in two vertical columns to the left of the alpha keys and a numeric/cursor keypad is to the right. LEDs are above the numeric keypad and indicate that the CapsLock, NumLock or ScrollLock are engaged.

A fourth LED in the same bank is a power on/off indicator. The layout is slightly different to the old IBM layout. The Esc key is relocated to a position above the numeric keypad, the */PrtSc key has been relocated to the extreme right of the keyboard and there are a couple of other minor variations. I wish every keyboard was the same, but this layout really

took little adaptation. The feel is good, with a noticeable over-centre action as a key is depressed, and without any loud keyclick as the key bottoms.

Performance

I ran a great range of commercial and Public Domain software, including games and graphics. All ran perfectly in one or other of the video modes. I did need to use either HGC.EXE or the Basic programs mentioned above to run graphics from Lotus 1A.

As indicated previously, the Acer can be run at clock speeds of 4.77 MHz or 8 MHz, defaulting to 8 MHz at bootup. A utility program can switch speeds, as can pressing Ctrl, Alt and the Plus keys at the same time. I ran many benchmarks on the machine. The hard disk has typical XT per-

ACER 500 XT

formance, with average access around 86 milliseconds, track to track seek around 15 milliseconds and a data transfer rate of around 130 Kbytes per second.

Processor intensive tasks, at the higher clock speed, varied from 1.7 times faster than a standard IBM PC to 3 times faster, with most being around twice as fast. Exactly as one would expect of a machine equipped with a standard hard disk and a V20 processor running at just under twice IBM PC clock speed.

Documentation

The Acer comes with DOS, Basic and utility programs on three floppy disks. Three manuals accompany them. A 10 mm thick user guide contains the basics of getting the system up and running, and installing and configuring options. The DOS and Basic manuals are each about 20 mm thick, and are essentially a reprint of the standard Microsoft offerings. All are well printed and illustrated and generally clear and accurate, though the user guide is marred by minor errors. The manuals are

far better than provided with most systems these days, but there is room for improvement as the very new user would find it difficult to get going if relying on them alone.

Conclusion

Would I recommend an Acer 500+ Series II? I not only would, to users with appropriate needs, but have done so already. While I had the review machine, a friend was looking for a PC clone for home. We discussed the available machines in general, and the Acer 500+ Series II in particular. He then went to the nearest Dick Smith store and took home an Acer System 2.

The Acer 500+ Series II offers good general performance and excellent video performance in a compact and economical package. The inclusion of monitor, DOS, Basic and manuals makes it very good value. The Acer might be laid out in an unconventional manner, lacking a motherboard, but it has all the standard circuitry, merely rearranged over expansion boards.

The only limitations are that it has only two drive bays, and that only one slot is free on systems with hard disks. This is of very little real consequence as the machine is very completely equipped, and only an expanded memory or LAN board could be needed. There is plenty of room for one or the other if ever they are required. The limitations will affect a minute fraction of potential users, and is a small price to pay for the compact footprint. The Acer 500+ Series II is one of the nicest entry level PCs available. □

Product Details

Product: Acer 500+ Series II
From: Dick Smith Electronics, PO Box 321, North Ryde 2113 NSW;
(02) 888 3200

Price: System 1 \$995;
System 2 \$1395;
System 3 \$1995.

All prices are taxed and include TTL monochrome monitor, DOS, Basic and manuals.

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The Tandon Pac 286

'Secure' and 'portable' aren't usually used to describe hard disks and the data on them, but they are only two of the features of this innovative AT. Ewart Stronach reports . . .



Figure 1. Tandon has packed a lot of innovation into the Pac 286. For example, its engineers have gone along way towards overcoming one of the major shortcomings of the 80286 with the memory mapper, which enables the machine to run constantly in real mode rather than protected mode.

TANDON IS is a name synonymous with disk drives. My earliest 35-track single sided, full height, space and power gobbling monsters were Tandons and even then they were regarded as a thoroughly reliable product. Tandon has just launched a totally new concept in transportable data. Its new AT compatible, the Tandon Pac 286, goes further into the realms of totally safe, portable data than anything else I have seen.

The main unit is in the now popular tower configuration, but it's not as large as the current rash of towers (which are really just AT clones standing on their edges). For those who don't need a tower, the unit is also equipped with feet in the 'normal' place and looks about mid-way between a full-sized AT and one of the compact or small footprint models. The dimensions are: 400 mm wide, 380 deep and 240 high. Into this small package, Tandon has packed a lot of innovation.

Let's jump straight to the main innovation. When you unpack the Pac 286, you are confronted by two great gaping holes taking up nearly a third of the front panel. The solitary 1.2 megabyte floppy drive sits on the top of the unit for easy access if it's standing on the floor next to a desk. The two holes are oblong with one beveled corner and further investigation of the contents of your packages turns up two bulky looking boxes which look like they just might fit in the aforementioned holes.

Personal Data Pac

A closer examination of one of these boxes reveals the Tandon logo and the notation Personal Data Pac, 30MB. The Pacs weigh 1.18 kg each and measure 177 x 121 x 74 x 64 mm. The Pacs provided with the main system were already fully formatted and contained MS-DOS 3.2, GW-Basic 3.2, Data Pac utilities, and Windows, including Windows Write and Windows Paint. Simply slide your Data Pac into the top opening and switch on. The Tandon Pac 286 will boot to the Data Pac and proceed to operate as a standard AT with two 30 Mbyte hard disks.

The system looks at the twin disks as totally normal hard drives, C: and D:. They

are quite fast, with a normal seek time of around 50 ms. The seek time is enhanced by a very sophisticated cache system which retains large amounts of disk data in a RAM bank or cache buffer to reduce the number of times the disk must be accessed. As the disks are driven by proprietary software rather than a standard disk controller card, I was not able to run my normal disk speed tests on them, but it is obvious that they perform better than most of the stepper motor hard disks currently available.

To date, hard disks have been very fragile beasts. Even the drive card style of hard disk, in which the disk is mounted on its controller card for ease of removal and transport, have required careful handling



Figure 2. While the system comes standard with only one serial and one parallel port and only three unused slots (all 16-bit), expansion is provided for on the mother board.

and dis-assembly of your computer to shift them from machine to machine. The Tandon Personal Pac is ejected from its slot by pressing Alt-1 or -2, like a fat video cartridge.

While playing football with it is not recommended, it's a sturdy piece of equipment. Tandon's tests show that the Pac can withstand dropping up to 45 mm onto a rigid surface such as concrete covered with vinyl, or 60 mm onto carpet, without structural damage or loss of data (that's the equivalent of about 250 Gs!). The eject command automatically starts a park and protect sequence in which the heads are moved to a safe portion of the disk and a plastic separator is inserted between the disk and the heads, locking the heads and protecting the disk surface. The mechanism of the disk is protected in its case by special rubber shock absorbing mounts, but it is worth noting that the head protection is only in place when the Pac is out of the host – when in use it is as susceptible to shock as a normal hard disk unit.



Figure 3. The Personal Data Pacs contain a 30 Mbyte, 3 1/2 inch Winchester surrounded by a rigid steel frame with four shock absorbers – it's rated to withstand 250 Gs!

A flexible AT

So what does it all add up to? A very flexible AT system in which Data Pacs can be shared between users, physically collected from various data entry points for central usage and, perhaps most important, the highest degree of security available. None of us know when the office will burn down (*right, Jake?*) and the ability to store your data easily and conveniently in another building is of primary importance. The alternatives for data back-up (such as streaming tapes) fade into the past both in speed, data security and convenience. As an alternative to floppy disk back-up, consider the fact that a complete 30 Mbyte back-up to another Data Pac would take about two and a half minutes by which time you would have your first two floppies formatted, and only need to format another 23 or so before you start copying.

Inside

Opening the unit is different, but no harder than gaining access to a normally laid out IBM or clone. The front panel comes off with five screws and the top or bottom flat panels slide out to allow access. There is a further shield to remove to allow access to the expansion slots. There are only three available slots left and, as set up, these are all AT slots. The video card lives in the only 8-bit slot available, but other 8-bit devices will plug into the 16-bit slots. It's very tight in there and the quality of the boards is superb. The disk control board is a double mother/daughter board and the disk con-

trol chips are RLL (Run Length Limited) type which allow a 20 Mbyte disk to format to 30.

There is obvious provision for future expansion with the motherboard terminating in an edge connector and a push out panel in the case to allow a further expansion unit to be connected.

There is no room for further devices inside the case, but as I mentioned, the floppy disk drive sits on top of the main casing, and is indeed a separate unit. An additional floppy maybe added to the 'pile' and control is available from the existing card. Power to the additional floppy is carried on the main ribbon cable and I surmise that the add on kit comes with a new top for your existing floppy and a new cable. (Fitting of the second floppy would not be a job for the office boy.)

Options

The options available for the Tandon Pac 286 include the aforementioned floppy, either 1.2 Mbyte or 360 kilobyte, and 1 and 4 Mbyte memory expansion boards. The memory expansion does not require one of the few slots left available on the motherboard. The video card will handle either mono, Hercules or EGA, with resolution up to 640 x 350 in 16 colours, and is a short card.

The software that comes with each Data Pac includes a utility suite specifically for the Pacs. All normal copy and back-up programs appear to work, but specific copy utilities are included with the unit to simplify the task. The utility called DPCOPY is primarily designed as an archive utility and when invoked, checks the

TANDON PAC 286

destination Pac and advises you if it has already been designated as an archive of the primary Pac before allowing you to proceed. Each Pac contains its own unchangeable serial number and this is displayed for checking during this operation. Other specific utilities allow you to change the keyboard sequence which ejects the Pacs and a low level formatting program for a total rebuild if needed.

The application software is a bonus. A demonstration program is supplied which gives a good working overview of the suite and includes promotional looks at Microsoft's Chart, Multiplan, Project and Access. Full copies of Windows with Windows Write and Windows Paint are included in the price, along with GW-Basic, the MS-Dos3.2 operating system and utilities.

On a more technical note, Tandon's engineers have gone a long way towards overcoming one of the major shortcomings of the 80286. With their memory mapper, they have enabled the Tandon Pac 286 to run constantly in the real mode rather than the protected mode. With the processor running in the real addressing mode all the time, the memory mapper controls the re-mapping of the memory for the three new modes, clone mode, mapped clone mode and extended mode. All this is invisible to the normal DOS user, but, believe me, it speeds up the machine and opens new areas to development users.

The Tandon Pac 286 can be forced to boot from any installed disk by holding down the space bar after booting. This invokes a screen which allows you to select the device containing DOS. Similarly, a system set-up can be called up by holding down the Escape key after booting until two beeps are heard. This displays the current configuration of the unit and allows alteration after changing devices or graphics boards. The processor speed can also be controlled from the keyboard with the use of the Alt, Ctrl and Slash keys which will toggle between the now 8 MHz and 10.5.

Documentation supplied with the Tandon Pac 286 is plentiful, if of dubious physical quality. Two light card slip covers contain a total of ten books, again with very light card covers and thin paper. Most are bound like a paper back book and difficult to keep open at a particular page without breaking the binding. That short complaint behind me, I must also say that the content is as comprehensive as any I have seen. The Operation and Installation

guide is thoroughly illustrated and logically written with a minimum of jargon. The only lowpoint in this book is the fact that over half of it is given over to error messages. A first time user confronted with all the possible things which could go wrong might just give up then and there!

The MS-Dos User Manual is easy to read with good descriptions of functions, examples of commands and clear warning of any command which could prove disastrous if incorrectly used. There is a separate small booklet describing the Data Pac utilities and another thin one on GW-Basic to back up the main GW Basic user's guide. There are a complete set of guides to the software, with the main booklet about the windows environment and smaller tomes on desktop applications and Paint, plus another quick reference guide.

Tandon may be a new name on the front of a computer but it has been in the data handling business for longer than most of you have been computer literate. Backed in Australia by Barson, another well established name, it must succeed. The new unit is innovative and the benefits it offers are very real. The first computer buyer would do well to consider spending the apparent extra money required, as the system contains as standard many of the options you would have to buy as expensive extras later. For existing users, there is an option to purchase just the Data Pac units for addition to your existing system. This could form the basis of a complete system without replacing your existing PCs.

My overall impression of the Tandon Pac 286 is one of quality and strength. My only criticism at this stage would be the lack of available expansion slots. The addition of an extra port, a bus driven mouse and a modem would fill the machine but the provision of an edge connector on the motherboard suggests that Tandon is already prepared to expand if necessary. □

Product Details

Product: Tandon Pac 286

Distributor: Barson Computers,
335 Johnstone St, Abbotsford 3067 Vic.
(03) 419 3033

Price: \$5604

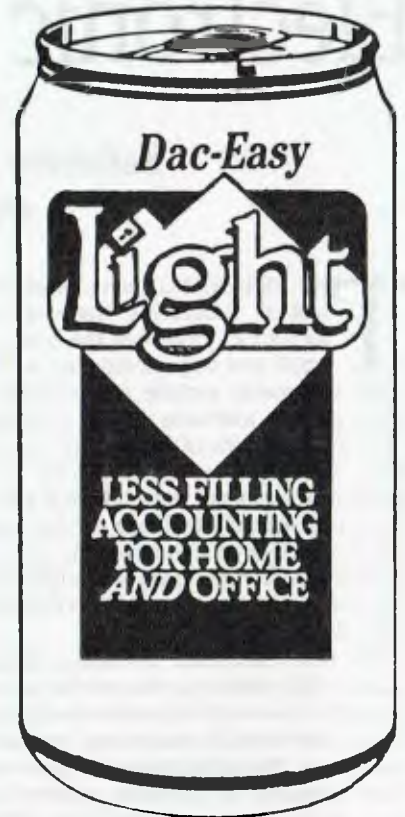
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Electronic Document Interchange

Katherine Harrington reports on a system that reduces the cost of administrative paperwork.

THE IRRITATING, but necessary task of processing trade documents has long been the bane of small and large companies alike. Trade documents include administrative forms such as purchase orders, invoices, price lists and bills of lading. Processing these documents is often a long and painstaking business, with staff dedicating their time typically to hours of checking and re-checking misinterpretation errors. Recently there have been investigations into the of transferring and processing these documents electronically.

The term Electronic Document Interchange (EDI) refers to a process that automates the transfer of information which is more conventionally transmitted on trade documents. These documents are increasingly generated by computer systems at their source and re-entered into other computer systems at their destination. For the past 14 years, experiments have been taking place to transfer the information contained in these trade documents directly from one computer to another across communication lines.

Take a typical example of a computer company wanting to buy disks to replenish its stocks. The purchasing officer will contact the disk manufacturer to determine the current price and availability of the required disks. The sales clerk at the disk manufacturer will answer this query by interrogating the inventory system.

All being well, the purchasing officer will then generate a purchase order on the computer companies' accounting system and then post it to the disk manufacturer. The disk manufacturer sales clerk receives the purchase order in the post and keys in the relevant information into the manufacturer's computer system. The availability and price of the disks is then re-checked and the goods are dispatched together with a bill of lading also generated on the disk manufacturers' computer system.

When the goods arrive at the computer company the stores clerk will re-key the

items on the bill of lading, following a check to ensure that all the stated items were received, so that the computer company's stock control system indicates the presence of the newly acquired disks. Meanwhile, an invoice is generated by the disk company's computer and sent to the computer company where it is re-keyed into its computer system by an accounting clerk.

Each time the details of the above transaction are keyed into a computer system or handled by a different person the possibility of errors occurs, and the cost of processing the transaction increases. Over the years some schemes have been tried to automate this process. A scheme was tried as early as 1975 by the US transportation industry which later also involved the US grocery industry in 1981. In 1986 Telecom Canada announced Traderoute, a public EDI service.

EDI

The primary problems associated with an EDI system are that every one uses different computer hardware and different software. One company's purchase order looks different to another's. Yet the information contained on each company's trade documents is essentially the same. This fact is relied upon by a sales clerk typing in orders from many different companies – the sales clerk has to translate the information from the foreign company's format to one acceptable by the clerk's computer system.

In the case of EDI, this translation task is performed by special computer software added on to the existing computer system. All documents are transferred between computer systems in an agreed format. Thus, the computer system sending the document must first translate it to the agreed format and send it to the destination computer system. The destination computer system then receives the document and translates it from this agreed format to its preferred format. One of the 'agreed formats' being investigated is that

specified in the American National Standard Institute standard number X.12 (ANSI X.12).

The actual transfer of information between any two computers is achieved using an electronic mail box. This avoids the problem of having to synchronise the operation of the communicating computer systems. Thus an electronic document would be sent as mail to the destination computers' mail box. The destination computer at some point in the future would interrogate its mail box, process the incoming electronic document and send an acknowledgment to the initiating computer's mail box. It is therefore possible for PCs used by smaller companies to exchange documents with mainframe computer systems used by larger companies with out permanently tying the PC to the task of sending and receiving data. The electronic mail system would be implemented on a third computer system. This third computer system may be either a public or private electronic mail system.

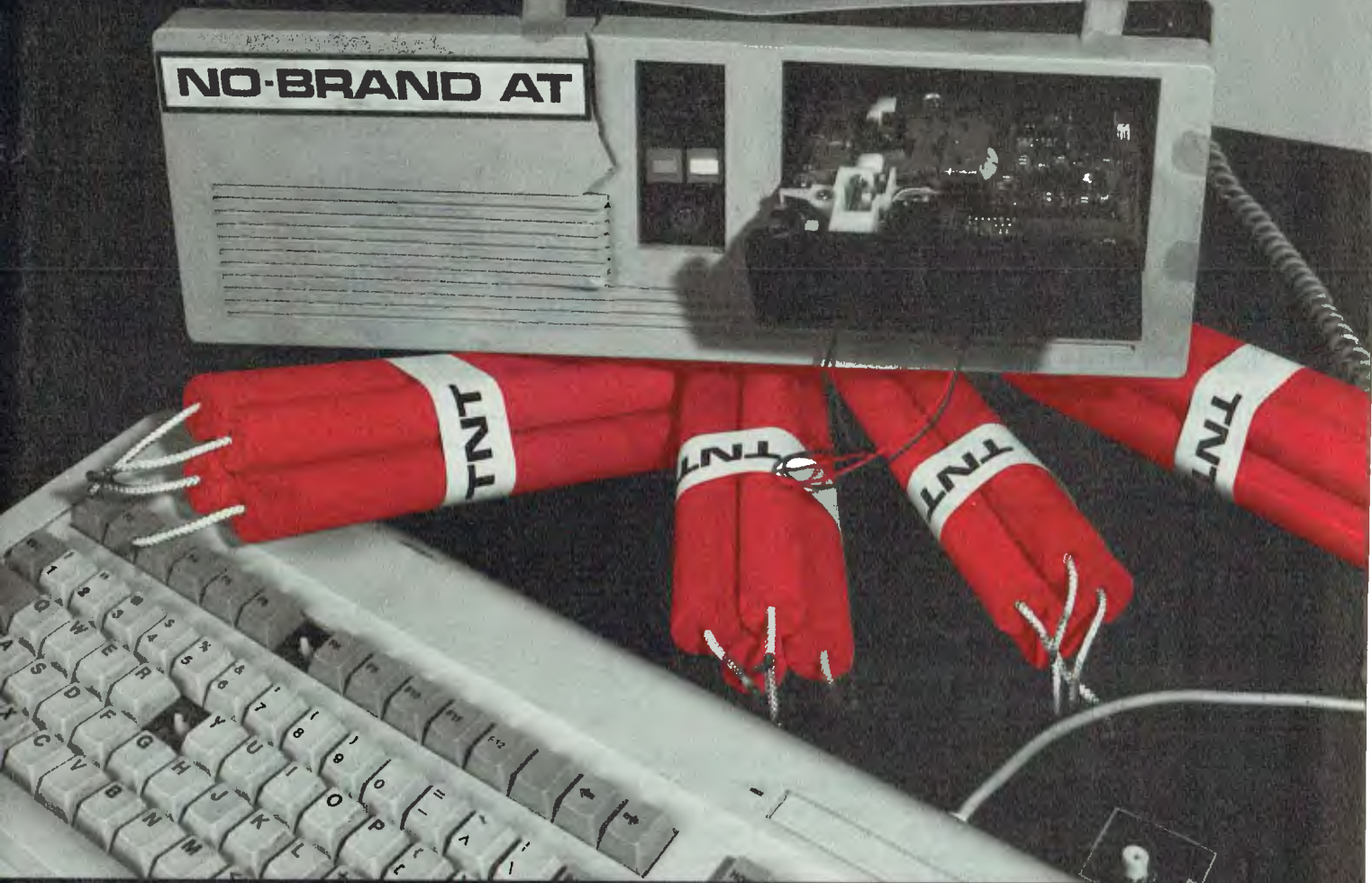
Standards for electronic mail messages are already in place. The International Telegraph and Telephone Consultative Committee (CCITT) standard X.400 for Message Handling Systems is gaining rapid world wide acceptance. Thus the vehicle for an EDI system already exists.

Conclusion

Companies wishing to prepare themselves for EDI can do so by taking a few simple steps –

- 1) Any new accounting or stock control software to be purchased should offer the possibility of an EDI interface;
- 2) The company should make arrangements to connect its computer system to an electronic mail service and start becoming familiar with its use;
- 3) Industry discussions, organised by recognised industry bodies should be conducted to encourage an orderly introduction of EDI. □

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CADKey

David Chatwin has been drawing with a new Cad package that's ready to set new standards (and you can have it bundled with a 230 megabyte Kangaroo!).

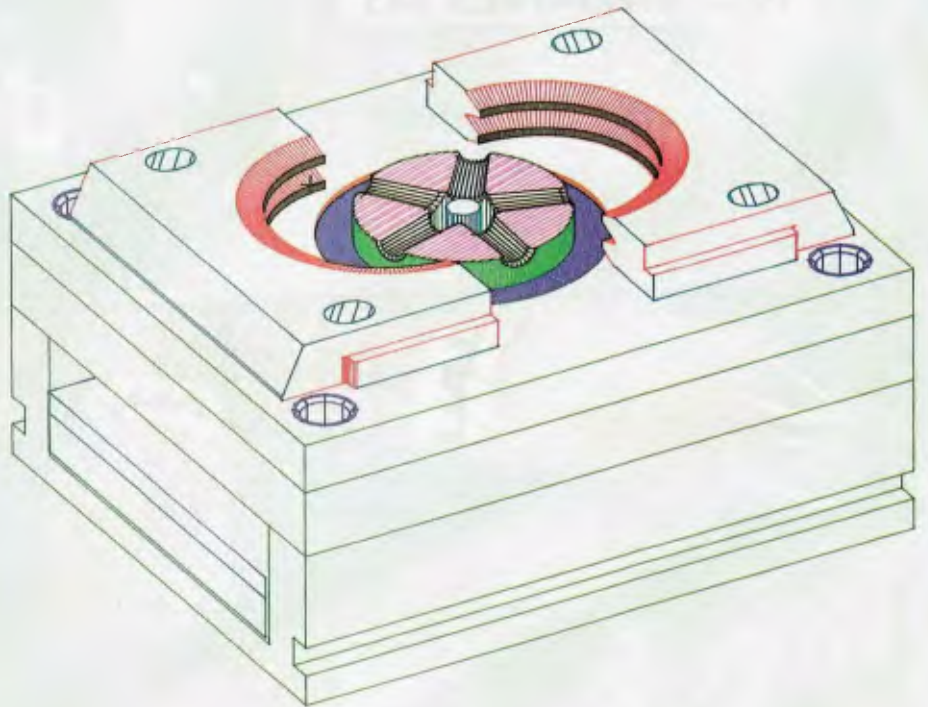


Figure 1. CADKey has the ability to output to a printer in a high resolution mode. While this may never match that available from a plotter, it can come very close, especially seeing as CADKey will support colour printers. This and the others figures with the article were produced with a Fujitsu DX2200 9-pin printer.

IT IS INEVITABLE that any of the many Cad packages that have been coming out of the woodwork lately are going to invite comparisons with AutoCad, and this is especially true of CADKey. The two packages are clearly aimed at the same market, cost about the same, and offer the same sort of features.

In terms of hardware requirements CADKey is ahead in that it does not need a co-processor, although one speeds things up considerably. Other hardware requirements are 640 kilobytes of RAM, at least 3 megabytes of free space on your hard disk, a floppy disk (of course), DOS 2.0 or later, and a graphics card and monitor.

Other desirable hardware requirements are a plotter or printer, a mouse or digitising tablet and extended memory. Like AutoCad, CADKey will use extended memory if it is there, but can survive without it.

CADKey supports a multitude of graphics cards, monitors, printers and plotters. It does not offer quite the same range as AutoCad, but all the common ones seem to be there. VGA graphics are supported, but strangely, Roland plotters are not, unless you run them in HPGL mode.

Like AutoCad, CADKey uses a dongle for protection against piracy. In this case, CADKey calls it a Software Interface Module (or SIM for short); whatever it's called, dongles are a nuisance. The one difference with CADKey, is that its dongle mounts on the parallel port, rather than the serial one, so it should at least cause less problems as far as wrong genders and socket type go. There is still the potential that the dongle may interfere with whatever is connected to the port, but at least this dongle is apparently happy to sit in either LPT1 or LPT2. (When will software companies learn that the best way to prevent piracy is to offer a good product at a reasonable

price?)

On the personal level, CADKey will cause you a lot less heartache than AutoCad in learning and coming to grips with. I found CADKey possibly the easiest to learn high powered Cad package I have ever come across. The manual is, thankfully, seldom needed, as the entire package is menu driven, with nice prompts at the bottom of the screen giving you some idea of what you need to do.

I thought that AutoCad had a big documentation set, but CADKey makes it look positively undernourished. There are only two ring binders in the set, but they are both over 50 mm thick, and very heavy to

CADKey is available from Minicom, bundled with the Kangaroo computer and Kurta digitiser.



boot. Unfortunately, the documentation is not the best I have seen. Certainly all the information you need to know is there somewhere, but finding it can be a painful experience.

Both the manuals are let down by a very poor index and table of contents, and seem laid out in a somewhat arbitrary manner. On the positive side, CADKey does have a tutorial in the manual which actually teaches you something about using the package. This is an aspect which is so often overlooked by Cad packages, but can be so vital in letting a new user gain confidence in using a package.

The tutorial is even nicer for the fact

that it starts off holding you by the hand and telling you exactly which keys to push, but in the process it also tells you exactly what you are doing and why. As the tutorial progresses, your hand is progressively let go, and you are simply told what needs to be done, but not what keys to push to do it. This is great for gaining confidence in the package, and I certainly came out of the tutorial having some degree of confidence in running the package.

The manuals are very comprehensive, once you know where to look for the information you want. A first time user or computer novice would have no difficulty in following the instructions to set up and

install the system, as they are comprehensive and easy to understand.

In fact, the manuals are very comprehensive and normally easy to understand as they do not descend into jargon too often. Where the difficulty arises is when you want to find out how to do something. Even finding the instructions for a simple matter like clearing the screen was a lengthy process. I looked under everything I could think of, including Clear, Screen, New, and so on, but could find nothing. I eventually found out what to do by experimentation with the Erase command. Otherwise, the manual is excellent as a reference document.

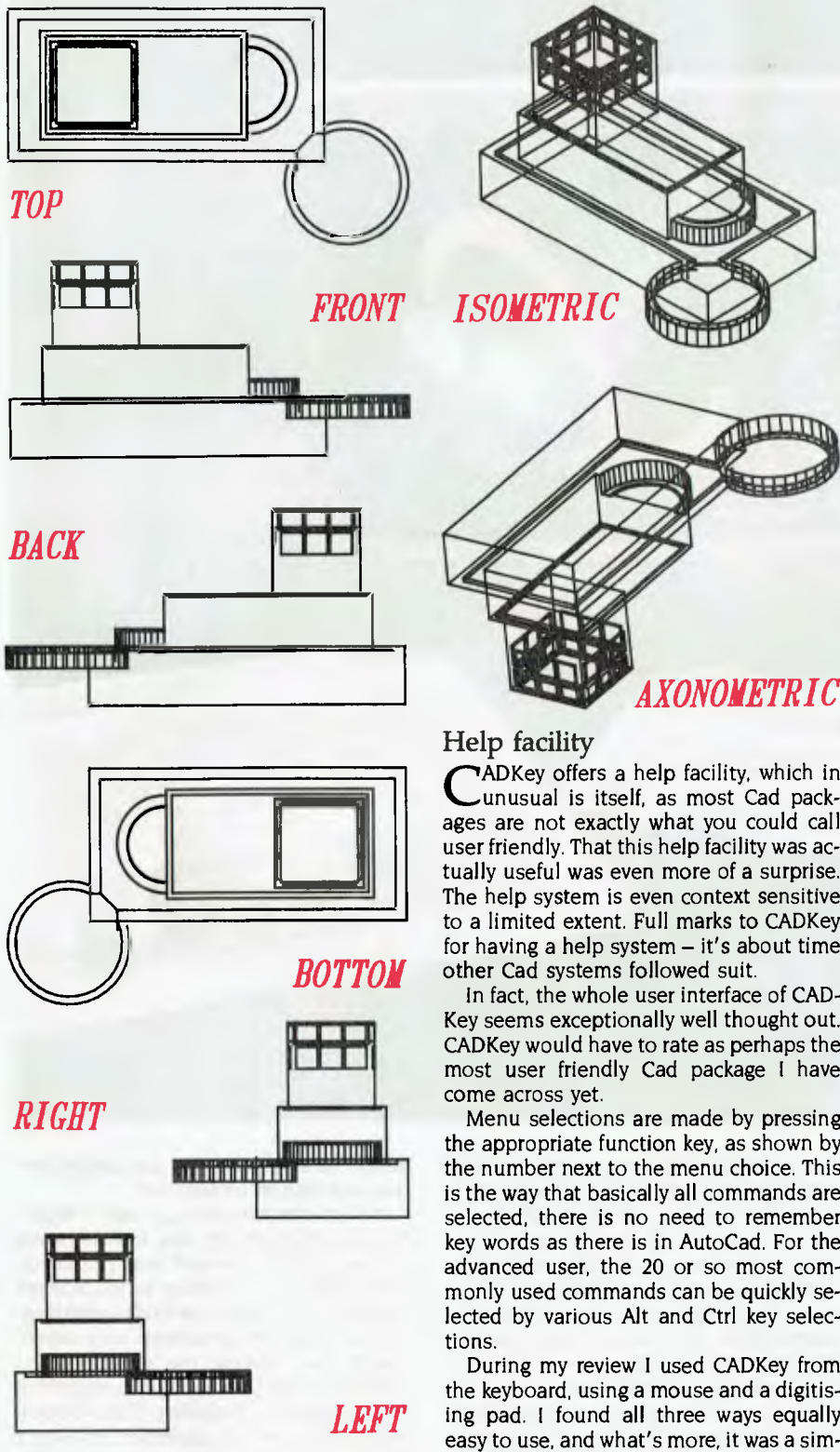


Figure 2. CADKey offers these eight standard views plus the ability to define additional ones.

consistent, easy to use and quick to learn. During the review period I never became tired of it, and it certainly was not buggy the way I found AutoCad to be.

Control box

Just to make life easier, the bottom left side of the screen is devoted to a 'control box' or status window, which contains about 30 various settings for controlling different parts of the drawing. These can range from such things as text height, the colour to be used, the active drawing levels, line type or even what view is to be displayed. This would have to be about the easiest (and most elegant) way I have seen of controlling these various settings and toggles and I would suggest that the likes of AutoCad take careful note.

This package has so many things I like it may be impossible to list them all, but I will give it a good go.

One of my pet complaints about all technical packages, and Cad packages in general, is that they are not generally user friendly. I very quickly began to realise that CADKey was out to change my ideas. In addition to the excellent menu structure, and the nice touches like the status window, I continually found new features that emphasised the overall refinement of the package.

File loading is one area that a lot of packages fall down in, simply because they will not give you a file listing that you can point at and say 'I want that one'. CADKey gives you this option, and I think it is about time that other packages followed suit.

Another endearing feature of CADKey is that it will keep repeating an instruction until you tell it to stop. This is handy if you want to keep drawing lines, or whatever, without having to repeat the command. It is also possible to go back up a level in the menu structure by pressing the F10 key. This makes it easy to slightly modify the instruction you are using by altering the previous menu selection.

CADKey also keeps a running display, or history line, across the top of the screen, telling exactly what command you are using and where in the menu tree you are.

Selection of points or entities to carry out the various drawing commands is excellent, with a variety of ways available, such as the end point of an entity, its mid point, its intersection with another entity, or even the point where the cursor is placed and so on.

Several CADKey commands give you the choice of accepting the result given, or going back and trying again with slightly

Help facility

CADKey offers a help facility, which is unusual in itself, as most Cad packages are not exactly what you could call user friendly. That this help facility was actually useful was even more of a surprise. The help system is even context sensitive to a limited extent. Full marks to CADKey for having a help system – it's about time other Cad systems followed suit.

In fact, the whole user interface of CADKey seems exceptionally well thought out. CADKey would have to rate as perhaps the most user friendly Cad package I have come across yet.

Menu selections are made by pressing the appropriate function key, as shown by the number next to the menu choice. This is the way that basically all commands are selected, there is no need to remember key words as there is in AutoCad. For the advanced user, the 20 or so most commonly used commands can be quickly selected by various Alt and Ctrl key selections.

During my review I used CADKey from the keyboard, using a mouse and a digitising pad. I found all three ways equally easy to use, and what's more, it was a simple matter to change from one method to another in mid-stream without getting horribly confused.

The whole user interface is delightfully

different parameters. This is particularly useful when dimensioning, as it lets you place the dimension in a different location, so that it is clearly visible.

I did notice the lack of an Undo command – CADKey has the ability to undelete deleted entities, but no all encompassing Undo function.

One problem I have usually found with Cad packages is in switching between the various views of an object, such as the front, side, top and so on, in three dimensional drawing. CADKey makes this simplicity itself, with there being eight standard views defined, and the easy ability for the user to define a new view themselves.

I was a bit disappointed, however, to find only four different line types – depending on the use you have in mind, this should not be too much of a problem for most users.

In terms of the functions offered, CADKey is on a par with AutoCad; each package offers the most common features, and they each have their own special commands which the other does not.

Where the two packages differ is that CADKey is so much easier to use. The user interface is superb, and makes AutoCad look positively archaic, and definitely not user friendly. With CADKey there is no need to learn and remember complicated command names, you simply select the appropriate menu choice.

Menu selection can be accomplished by using the function keys, as each menu choice is numbered 1 to 0, to match the function keys F1 to F10, or by using the mouse (or digitising pad pointer) to point to the command in the menu. Some of the most common commands can be accessed quickly by using Alt and Ctrl key combinations, but this option is limited to about 30 of the most frequently used commands, so memorizing them is not too much of a problem.

Another option in driving CADKey is to use a digitising tablet with a command overlay. With AutoCad, the overlay is included in the cost of the software, but unfortunately with CADKey you have to pay extra. I was lucky enough to have a Kurta pad with the overlay for the review package, but I normally found it just as quick and easy to use the normal menus through the function keys.

CADKey did confuse me at first, as instead of calling a drawing which is saved to disk a file, it is called a 'part'. I must admit to spending some 20 minutes or so looking for a option which would let me load all of a drawing, instead of just a

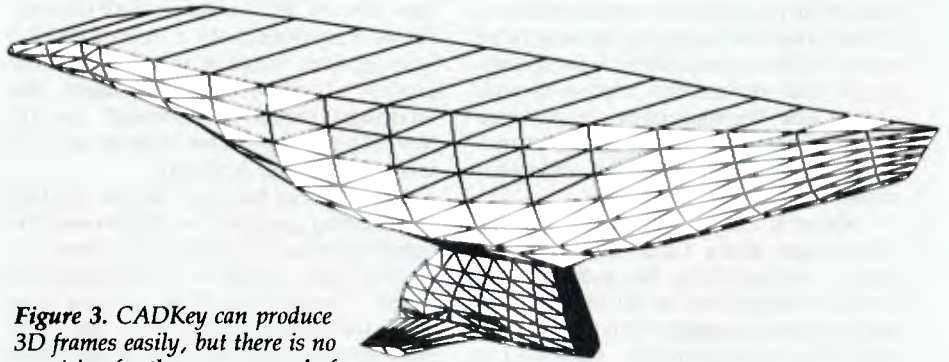


Figure 3. CADKey can produce 3D frames easily, but there is no provision for the easy removal of hidden lines in a 3D view in the standard package (this facility is available as an add-on, owever).

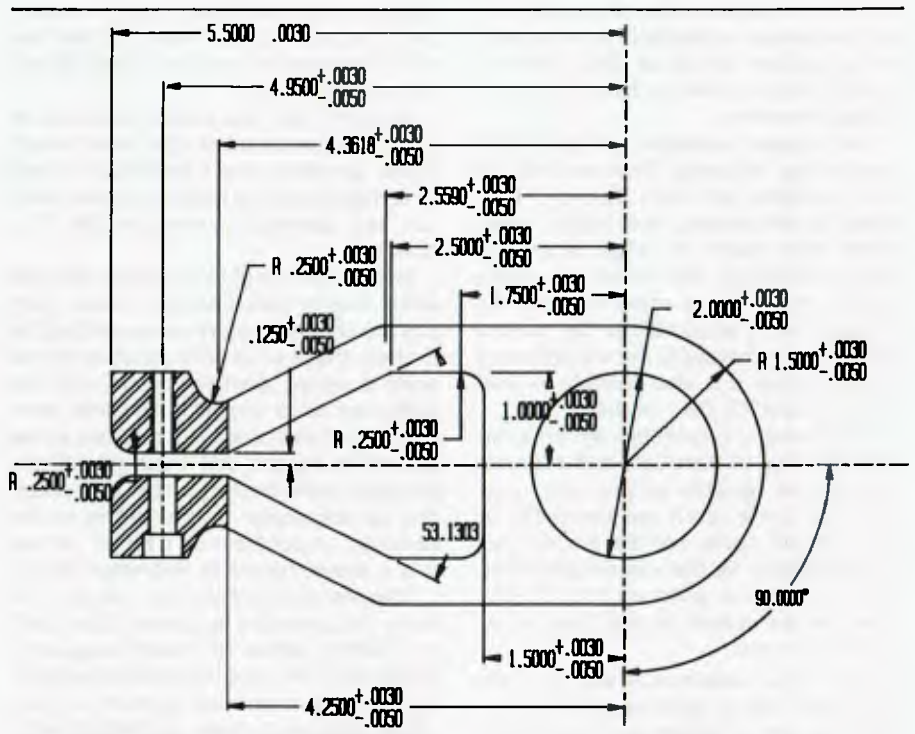


Figure 4. Dimensioning capabilities are as versatile as you could hope for, including the ability to automatically space out the leader lines on a dimension, so that closely spaced dimensions do not write on top of each other.

'part' of it, but once you are used to the terminology, it all becomes easy.

CADKey invites experimentation, as the commands are normally so self-explanatory that you do not have to delve into the manual too frequently. It was nice to use a Cad package that was fun to draw with, as well as being a useful tool.

There is also a freehand sketching function available for those with a steadier hand than mine.

Three dimensional drawing

Three dimensional (3D) drawing with CADKey is a lot of fun, as drawing the various components of a 3D object is incredibly easy. The 3D drawing capabilities are complemented by the very simple way of changing the drawing view or perspective. CADKey allows the user to define additional views on top of the eight provided with the system. The standard views are: Top, Front, Back, Bottom, Right, Left,

Isometric and Axonometric. If this is not enough for you, then it is simple matter to define a new one simply by defining three points in the viewing plane, or by specifying in three dimensions relative to your current view. The value of this for all types of work ranging from architectural to mechanical drawings cannot be underestimated.

CADKey is able to produce 3D space frames quite easily. I did miss the provision of any facility for the automatic removal of hidden lines in 3D views. This is surprising in a package of this calibre (and cost). The documentation suggested a manual way of removing hidden lines. But as anyone who has done it would know, removing hidden lines manually is a quick way to wind up climbing the walls. Minicomp has assured me that automatic hidden line removal is available as an add-on to the package, for about \$200. Unfortunately, I did not have a chance to test it during the review.

Text options available are good, not outstanding, but good. There are only six fonts available, but a fair degree of flexibility in customizing the height, angle aspect ratio (width to height ratio) and slant of text. Again, the control box comes into its own here, as some of these options are easily accessible in the control box, instead of having to use the full menu command tree. It is also possible to read text in from ASCII files on disk.

Dimensioning capabilities are on a par with the likes of AutoCad, and certainly were just as versatile as you could ever hope for. A nice touch was the ability to automatically space out the leader lines on a dimension, so that closely spaced dimensions do not write on top of each other, but are spaced so that they can be individually read.

The on-line calculator is very powerful and useful, and is quite capable of handling the sort of equations one encounters in 3D modelling.

Like AutoCad, there are a variety of third party applications available for CADKey for doing all those sorts of odd things that people seem to want to do with one of these packages. I don't know if CADKey can offer quite as many as AutoCad, but the list is certainly comprehensive, and seems to be growing.

Another feature I liked was CADKey's ability to output to a printer in a high resolution mode. While the output from a printer may never match that available from a plotter, it can come very close, especially seeing as CADKey will support colour printers.

This is a definite advantage over the likes of AutoCad. The figures with this article were produced with a Fujitsu DX2200 9-pin printer. While it is not up to the quality of output from packages like Prodesign (which I reviewed for YC, Nov.'87), it is better than nothing, and certainly better than AutoCad.

CADKey also has two off-line printing and plotting programs which increase the control you can have over the output, including such things as scaling and pen speed. I would have liked to have seen these facilities available from the main program (like AutoCad), but at least they are easily available, and the quality output from a printer does compensate to a large degree.

I was somewhat surprised to find that CADKey does not enable you to stretch part of a drawing, but I am told that this will be corrected in version 3.10, which will be available soon.

Version 3.10 (I was told) will also allow you to create conical entities based on ellipses, parabolas and hyperbolas, as well as constructing arcs tangent to three entities and automatic saving to disk of a drawing.

Macros are one of those things that you either love or hate. CADKey at least gives you the chance to express your feelings as it offers those of us with an adventurous spirit to record, playback, merge, edit and otherwise muck around with those wonderful creatures called macros. I am a true believer in macros, and it was great to see a usable macro facility on offer in CADKey. You can also assign macros to keys on the keyboard, or positions on a tablet, so that it is a simple matter to implement them.

Like AutoCad's AutoLisp, CADKey offers a programming language called CadL (or CADKey Advanced Design Language). While CadL may not be quite as powerful as AutoLisp, it certainly appears to be a whole lot easier to learn and implement. I felt that the majority of users would not feel at all restricted by CadL, and would not notice the possible difference in programming power between AutoLisp and CadL.

No blood, sweat or tears

As I said earlier, CADKey invites comparisons with AutoCad, purely because the two products seemed pitched at the same market. Like most competitions, there can only be one winner, and I would have to vote for CADKey. Its simplicity of use, the outstanding user interface and the provision of a help facility outweigh the drawbacks (like the hard to use manuals).

With CADKey the novice user will not have to invest the blood, sweat and tears they would have to with AutoCad in getting up to speed with the package. The user interface is nowhere as frustrating as AutoCad's, and is pleasantly consistent and easy to use. The package overall shows that a great deal of thought and effort has gone into developing a Cad system that the user will like to use.

For my money, CADKey is a winner, and it gets my vote as perhaps being the best PC-based Cad package on the market today. That may be a little different to being the most powerful as I am not sure which package (CADKey or AutoCad) is the more powerful. Each has its own particular areas in which it shines, but the ease of use and overall refinement of CADKey more than compensate for any possible lack of power it may suffer compared to AutoCad in some areas. At the price, it has to give AutoCad and company a run for their money, it certainly deserves to.

If you have a particular need for a third party system that runs on AutoCad, still give CADKey a go, the type of application you want may be available for CADKey, and I think that you would be getting a better Cad system overall.

Now, all I need to do is figure out how to win Lotto so I don't have to give this copy back! □

Product Details

Product: CADKey 3.02
From: CADKey Incorporated
Distributor: Minicomp, 6th floor, 104 Mount St, North Sydney 2060 NSW (02) 957 6800
Price: \$6265 taxed

Product: Kangaroo PC
From: Kangaroo Technologies Corporation, California USA
Distributor: Minicomp, 6th floor, 104 Mount St, North Sydney 2060 NSW (02) 957 6800
Price: Minicomp 386 tower configuration with 16 MHz; 80387 maths co-processor; 1.2 Mbyte floppy drive; 220 Mbyte hard disk; 1 Mbyte RAM; EGA graphics card and Multisync monitor – \$20,608 taxed; Kurta digitizer (including mouse) – \$1944 taxed.

According to the Australian distributors for the Kangaroo, the machine will be renamed the Minicomp 386 by the time this review appears.

Kangaroo PC

My first comment when I was asked to review the Kangaroo PC was to ask if it was related to a Wombat. For those of you who don't get this, the Wombat was an Apple II clone that caused quite a few legal heartaches several years ago, and if you can't remember the case — you're too young to be reading this magazine. (It also goes to prove that legal bun fights are nothing new to Apple.)

Despite the name, there is nothing Australian about the Kangaroo, it is entirely American in origin. I am still not sure if the name is an attempt to make the machine sound Australian, or simply an attempt to cash in on the apparent popularity of all things Australian in the US.

The sticker on the back of the Kangaroo proclaims that it is a product of Kangaroo Technologies Corporation of California, but my internal probing revealed that everything is apparently made by Micronics Computers, USA.

The Kangaroo range is available in several configurations, starting off with an XT clone. The next model up is the AT clone, and the range finishes with the 80386 machine tested. The review machine was fitted with a NEC Multisync monitor and a Sysgen tape streamer.

Tower configuration

The Kangaroo looks like a fairly normal AT type clone from the outside, measuring up at a fairly standard 600 x 485 x 165 mm, and is the usual off-white colour that all PCs seem to be these days. It is a little bit unusual as it is a tower configuration, and in the number of device slots it offers.

The Kangaroo appears well engineered and built, and the case certainly looks and feels strong and heavy enough to take its fair share of punishment without causing any dramas. Flimsy is the last word I would use to describe the case, but it does cause a slight weight penalty. In a tower configuration this would not normally be a problem, but it would need to be looked at if you were intending to put the Kangaroo on a desk.

Because the case is fairly narrow, it uses four feet which fold out from the bottom to give it stability when the Kangaroo is used in tower configuration. I tried using the Kangaroo without the feet folded out, but it refused to stand up without them. These feet lead to my first complaint. They tend to fold away whenever the machine is

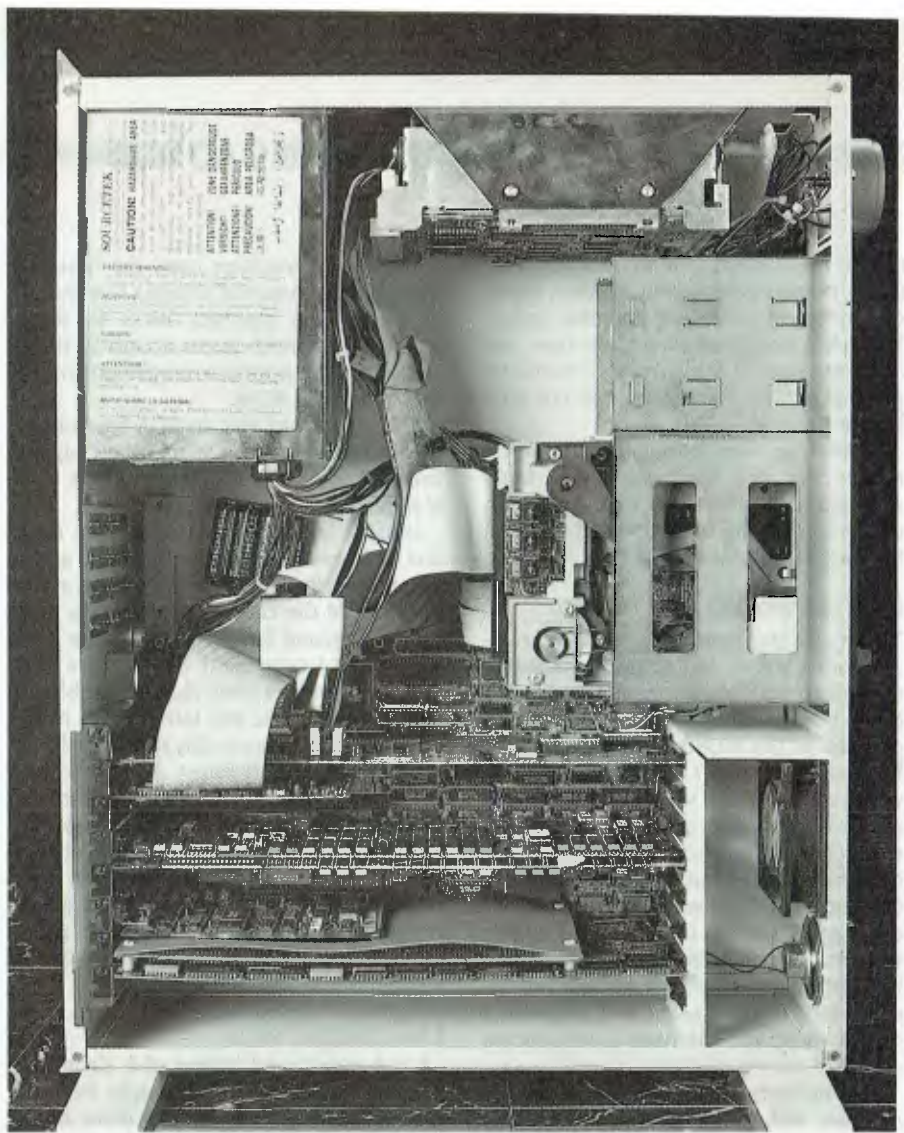


Figure 5. The motherboard is an 80286 with an 80386 adapter board plugged in, and in the review machine, included an 80387 maths co-processor. The unit has 8 expansion slots, with three 8-bit slots and five AT style 16-bit slots. The unit comes standard with a 230 Mbyte Priam hard disk.

moved, which can be a distinct problem if you forget to fold them out again.

My second gripe has to do with the tower configuration itself. The Kangaroo will only stand on the left hand side of your desk, with the the screen and keyboard on the left hand end of the desk, as the cords to the keyboard and screen are too short to reach any further. Surely, it wouldn't be too difficult to give us poor users a couple more feet of extra cable so that we could have a more flexible arrangement.

The front of the Kangaroo looks as if it can't make up its mind as to whether it wants to be a desktop machine or a tower machine. The 5 1/4 inch device slots are mounted so that they are vertical in the tower configuration, whereas the 3 1/2 inch device slots are mounted so that they are horizontal. To add to the confusion, the lettering on all the buttons looks as if it is meant to be read with the case horizontal on a desk, not vertical beside the desk.

Certainly, I did not see anything to indicate that the Kangaroo could not be used as a desk top machine, apart from its somewhat overwhelming footprint.

The buttons on the front are another area that cause me some concern. The Turbo button did absolutely nothing on the test machine, but I have been assured by the distributor that this was because it is a 80386 based machine. Apparently the 80286 machines will support the turbo feature. Even more worrying was the Reset button. Now, I am a great fan of reset buttons, as they save you having to turn the machine off if it hangs up sometime, but (and this is a big but), they must be placed where they cannot be accidentally activated. I know many people who have lost large volumes of work through a reset button being accidentally touched.

Unfortunately, the Reset button on the Kangaroo is not recessed, covered or protected in any way, and only needs a light press to create havoc. This is such a major

risk (to me at least) that if I bought a Kangaroo, I would think seriously about either disconnecting or moving the reset switch. The risk is magnified on a tower type machine because of the danger of someone walking into or leaning on the machine beside the desk.

Continuing our external examination reveals that the Kangaroo has a fairly standard back, with room for eight 25-pin connectors on the back cover. The rest of the back is standard AT clone.

Internal workings

Internally, the Kangaroo offers some interesting points. For starters, the motherboard (planar board for you IBMers) is a 80286 board, with a 80386 adapter board plugged in. The 80386 adapter board also has room for a 80387 co-processor (which was installed on the review machine), and seemed to be a neat adapter, with no sign of patch cords and so on. I could not get the adapter board out to see what was underneath, but from what little glimpses I could get, it seemed to be covering a fairly standard pair of 80286/80287 sockets. Unfortunately, the adapter board will not accept a 80287 co-processor, so if you want a co-processor, you will have to fork out for a 80387.

The motherboard can only be described as huge, with heaps of room around all the chips. In a tower machine this is not too much of a problem, but I can't help but think that if they made the board smaller, the machine could become a desktop quite happily.

Norton Utilities rated the Kangaroo at a Performance Index of 23.0, for what it is worth. In use, the machine certainly flew along, but with a 80386 running at 16 MHz, and a 80387 on board, you would have to expect it to. The motherboard has 8 expansion slots, there being three normal 8-bit slots and five AT style 16-bit slots, one of which also has a 32-bit slot for the memory card.

The review machine had a memory card, the video (EGA) card, an I/O card, and the disk controller installed. Another slot was also occupied by the controller for the tape streamer. The memory card comes standard with 1 Mbyte of RAM, and on the review machine this had been expanded up to the maximum 2 Mbyte available on the card. All memory on this card is in 256 Kbyte chips; with the 80386 machine this is expandable to a total of 10 Mbytes. This card was also notable for having a cache memory of 72 Kbyte installed, although this is apparently an optional extra on the base machine.

The review machine used the 'shadow memory' technique of copying the system BIOS and the graphics BIOS to RAM, which allows much faster access to these areas than the normal arrangement where they remain in ROM.

The video card was an EGA type of unknown brand, but it did use the Chips & Technologies chip set, with the ATI EGA Wonder BIOS, version 3.06.

Unusually, the Kangaroo has two fans, one as normal in the power supply, and a second one in front of the card cage, at the front left of the case. I am not really sure why the second fan is thought to be necessary, but I suppose it does ensure that the cards are kept cool. The one problem I found was that the two fans tend to make the Kangaroo a reasonably noisy machine, maybe not the noisiest I have come across, but certainly not the quietest.

A nice touch is that the batteries for the clock and so on, are normal alkaline types mounted in a holder which enables easy replacement. This will certainly save you the replacement cost of the lithium types found in most AT clones, but they will not last as long as lithium batteries.

Half height slots

As I mentioned before, the Kangaroo has two slots for half height 5 1/4 inch devices (in this case a floppy drive and a tape streamer), and two slots for 3 1/2 inch devices (of which none were fitted to the review machine). All of these slots open out onto the front of the machine. Inside there is a mounting cradle for another full height 5 1/2 inch device, which in this case was the hard disk drive. Perhaps being in a Kangaroo, this cradle might be more correctly called a pouch – but I won't pursue that point.

On the subject of the hard disk unit, the review machine had a Priam 230 Mbyte hard disk fitted. Yes, you saw right, that is 230 Mbyte! It was actually 233.9 Mbyte, but who's counting? What was even better was the outstanding speed of this hard disk – it fairly flies along with average access times of 22.8 milliseconds according to Coretest, which is outstanding for a disk of this size.

The hard disk did cause me some worry at first, as when it is operating it can make the whole machine shake, rattle and roll to a frightening extent. But it doesn't seem to concern the Kangaroo, and you soon learn to ignore it.

The 5 1/4 inch floppy drive was a Fujitsu type, 1.2 Mbyte capacity, and seemed fairly robust and quiet in operation, although it tended to be slow on occasions.

The power supply is a useful 275 Watts in capacity, and has enough spare leads for all the normal devices you could fit. There are three leads suitable for 5 1/4 inch devices, and two for 3 1/2 inch devices. The power supply will also auto switch between 110 and 240 volt supplies, which elegantly solves the problem of having an American based machine which will not work on our power supply.

The Kangaroo has room to spare inside the case, and you would certainly not be in any risk of skinning your knuckles working inside the case of this machine. One thing I do like about room to spare is that you will never have to worry about not having room to add another disk drive or tape streamer or whatever at some later stage.

Summing up

In giving my final summing up of this machine, I had to look closely at its price, and the market I thought it would be aimed at. The price of the Kangaroo puts it on a par with the better 80386 based systems available on the market today. It would certainly be competing with the likes of, say, Compaq and the NEC Powermate.

In terms of the market for which it seems to be intended, the Kangaroo appears aimed at the high level PC user, who wants a powerful machine to do such things as Cad on. In fact, my review of CADKey was done on the review machine. I have no doubt that the Kangaroo would do good service as a file server on a network, and with the hard disk fitted, it could be ideal for this type of application. But the fact remains that my feelings tell me that it is aimed at the user who wants a powerful PC to sit on (or beside) their desk.

As I said before, the Kangaroo seems destined to compete with machines like the Compaq and Powermate series. Against this competition, it will have a stiff run, as it really does not offer anything better than the opposition. It does not do anything noticeably better than the Compaq or NEC machines, and is priced about the same.

The Kangaroo offers a hard disk of phenomenal capacity, with excellent access times. It also seems built to last, and is well engineered with a good layout and nice touches like two cooling fans. Against this are the average keyboard, and a couple of annoying problems like the feet which fold back at the slightest whim, and a noisier than usual operation due largely to the two fans I mentioned above. □



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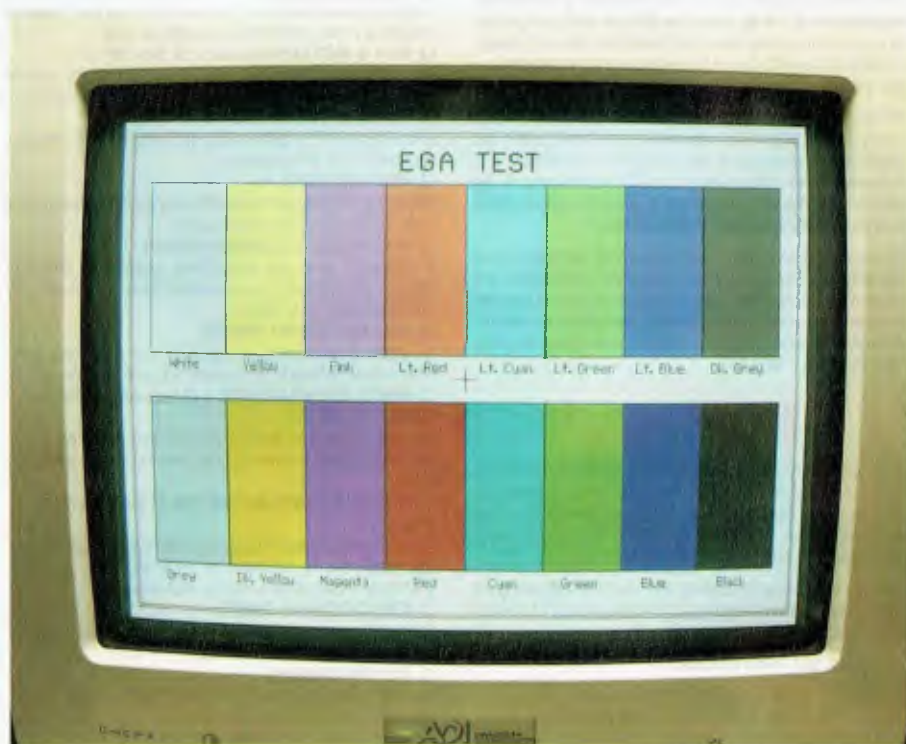
Monitors — a close look

The range of monitors is spreading rapidly, encouraged by the VGA standard, desktop publishing and the success of the Multisync. But what if you only want to upgrade to an EGA?

A PC is pretty useless without some means of communicating with the user. The monitor, keyboard and printer each play a vital role in keeping the operator in touch with what's happening. Imagine trying to use a word processor or a database without a monitor and you will understand the relationship.

If you have a monochrome or CGA monitor, it will probably be the first item you'll want to upgrade. Today, there are more alternatives to consider now than 12 months ago. The range of multi-scan units has increased remarkably, and there are new monitors appearing that can handle the VGA display standard of the IBM PS/2 range of computers. Add the new high resolution, large monochromatic screens used for desktop publishing (DTP) and Cad work, and the range becomes almost daunting.

Rather than attempting to cover all monitors available, we chose four to look at closely — they were chosen because of the improvement they offer over the low end units that most of us get with our first PC. For many users, a good EGA monitor may be all that they require for the foreseeable future, and there is little point going for a multi-scanning monitor. For



the EGA and CGA display modes, we chose monitors from ADI and Taxan. For monochrome displays, the popular Wyse 700; and for comparison with the colour displays, the CPD 1402E from Sony.

Display modes

Firstly, a few words about display modes and the variables involved in monitor construction. Table 1 shows the way display modes have been developed and altered since IBM produced its first PC. The monochrome display adapter (MDA) is still in use in many computers sold today. It displays text in 80 columns by 25 lines, with a character cell of 9 x 14 dots.

The colour graphics adapter (CGA) standard came next, displaying two colours from a palette of 16 on a screen with 640 x 200 resolution. Text is displayed using a chunky 8 by 8 character cell, which

makes for a rather blurred image not too easy on the eyes.

The enhanced graphics adapter (EGA) mode followed CGA and is a much better display for colour graphics, with a resolution of 640 x 350, and 16 colours from a palette of 64. This mode displays text characters in an 8 x 14 dot cell. The cost of EGA display cards has dropped to as low as \$300, and it has become a popular choice in the world of IBM compatibles with a lot of software written to make the most of this mode.

But the EGA specifications are not quite high enough for a lot of CAD and graphics applications, so IBM produced a further standard, the Professional Graphics Adapter (PGA). The PGA outputs 640 x 480 with an analog signal giving 256 colours out of a possible 4096. When IBM announced the PS/2 range of computer hard-

ware, yet another standard of display was ushered in: the VGA display which is analog and has a maximum resolution of 640 x 480 pixels. The range of colours displayed depends on the resolution, with 16 out of 256,000 colours in the high resolution mode (640 x 480), and 256 out of 256,000 in low resolution (320 x 400).

With the above IBM displays, a monitor was produced for each mode, which meant that when it came time to upgrade, whether to a new computer or a new display adapter, a new monitor had to be purchased as well. This led to NEC and other manufacturers developing multi-scanning monitors that could accept a range of resolutions and frequencies, the idea being that you would never have to worry about purchasing another monitor. Some of the multi-scanning monitors can accept the analog VGA signal, others cannot; it always pays to check before you buy.

Display cards have been developed for a variety of uses from high resolution 1600 x 1200 specialist applications to enhanced versions of the CGA and EGA modes. Genoa Systems (Hypec; (02) 808 3666) make an EGA board with an 800 x 600 display, and the Hercules graphics card displays 720 x 348. If you are about to change monitors, it might be a good time to take a look at what is available in display cards, bearing in mind that a non-standard (meaning non-IBM compatible) display will require special screen drivers for your software to work properly. In the non-IBM world, there are other display standards as well (including Macintosh II, Amiga, Apple II), and each one has its own particular requirements regarding suitable monitors.

Specifications

Resolution and the number of colours are just two of the variables involved in monitor specification. Other things to look at are the type of video signal running from the display card to the monitor, and physical characteristics of the monitor itself that influence the sensitivity of the display. The video signal can be digital or analog. If your display card outputs MDA, CGA or EGA (or all three), then the signal is TTL digital. Red, green and blue information is carried separately, along with sync pulses, to the monitor. With the PGA and VGA displays, the signal is analog, and the monitor has to be able to accept an analog input. Sync pulses carry information that effects the rate of display of horizontal lines and the vertical refresh

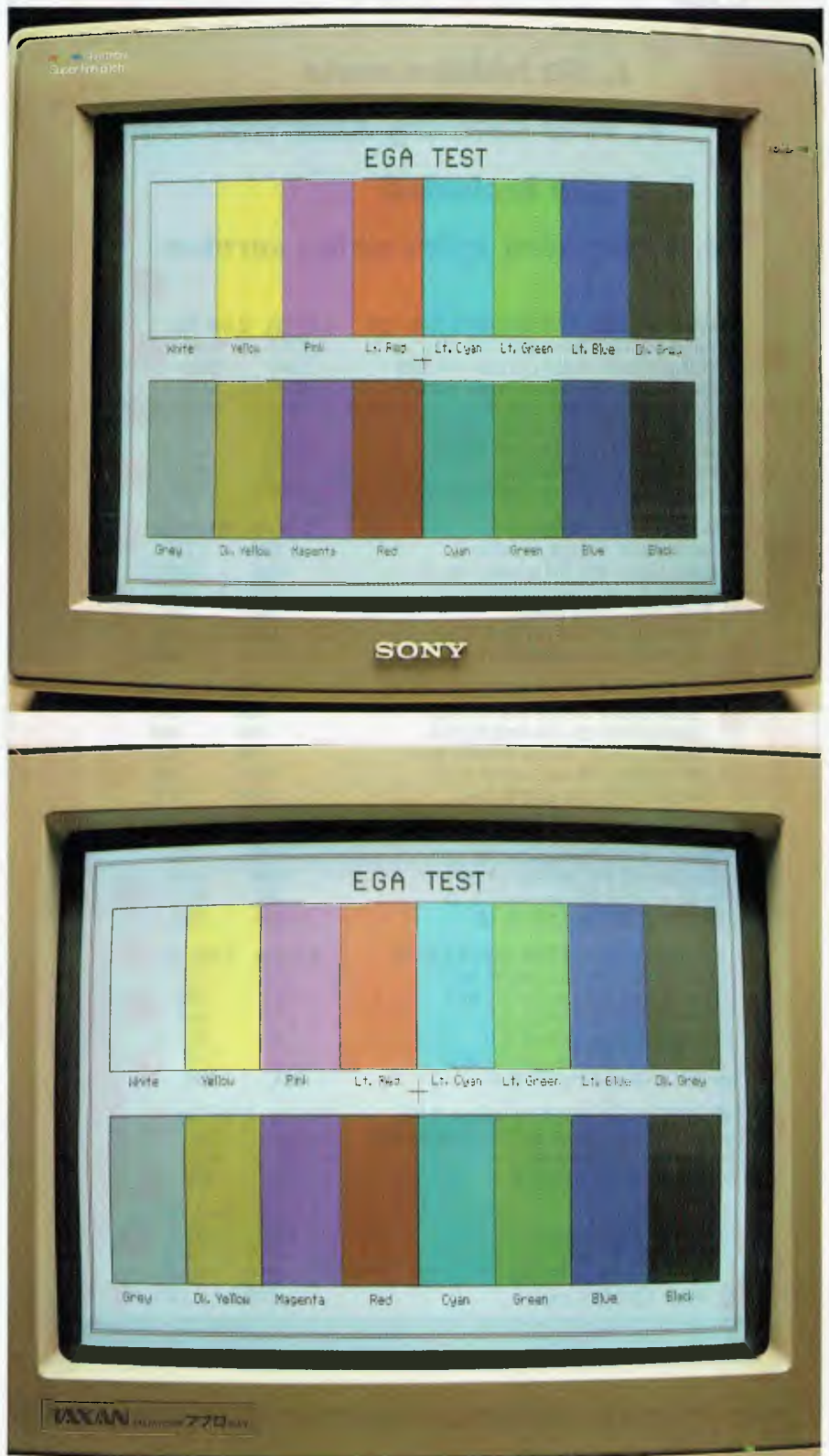


Figure 1. Our colour test in EGA mode showed little difference between the three colour monitors (ADI - opposite; Sony - top; Taxan - bottom).

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321SL with colour option	925	1087
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Epson FX850 264 cps draft/45 NLQ	769	899
Fujitsu DX2300 170 cps draft/54 NLQ	790	939
Star NX2410 170 cps draft/57 NLQ	627	739
Star ND10 180 cps draft/45 NLQ	655	771

132 Column LETTER QUALITY

	\$ Ex Tax	\$ Incl Tax
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Star NB2415 216 cps draft/72 LQ	999	1173
Toshiba 341SL 226 cps draft/72 LQ	995	1172
Star NB15 300 cps draft/100 LQ	1329	1563

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	\$ Ex Tax	\$ Incl Tax
Epson FX1050 264 cps draft/45 NLQ	969	1137
Epson EX1000 300 cps draft/50 NLQ	1050	1239
Star NX15 120 cps draft/30 NLQ	549	649
Star NR15 240 cps draft/60 NLQ	836	986
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rate. These are different for each display standard, and the multi-scanning monitors have the ability to display a range of frequencies.

All of the variables mentioned so far refer to the signal that is coming from a computer's display adapter, or card, via software that is running on the computer. If your software only displays monochrome or CGA modes, then that is what you will see, even if it being displayed on a fancy ultra-high resolution, multi-colour, multi-scanning monitor. (There are some exceptions, such as when a PGA analog display can emulate a CGA digital mode). There have been many monitors manufactured to accept the various modes, but what is it that makes one monitor better than another if they are used to display the same mode?

Like to know more?

Ewart Stronach reviewed the new, paper-white Multisync II and the high resolution, EGA Thompson 4470D in 'Monitors ... are they worth looking into?' in our April '88 issue. He also discussed the need for EGA and VGA, and tried the EVA 480 graphics card and the Vega VGA board.

Monitor specifications are usually mentioned briefly in advertisements with priority being given to the display size (12, 14, 19, 20 inch, whatever), and the maximum resolution the monitor can handle. The display modes it can accept are usually mentioned also, but this information is still not enough to make a considered judgment on a monitor's potential performance. The extra information needed includes the horizontal sync frequency (which is different for each mode), the vertical frequency, and the dot pitch. The horizontal frequency is roughly equivalent to the number of lines per second that can be displayed, so that a lower resolution mode, such as CGA, requires a monitor with a horizontal frequency of 15.75 KHz, whereas an EGA mode uses 21.8 KHz, and VGA 31.49 KHz (see Table 2).

The dot pitch is a measure of how fine the holes are in the mask that sits just behind the screen in colour monitors. Most monitors have a dot pitch of 0.38 (CGA) to 0.31 mm. The smaller the dot pitch, the finer the dots: Sony has the finest with the CPD 1402E at 0.26 mm. The EIZO Flexscan and the Taxan Supervision multi-scanning monitors each have a dot pitch of 0.28 mm.

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To put it simply . . .

Pixel – 'Picture Element'. One picture element on the screen. Some displays use several dots to make up a pixel, but usually one dot (the smallest possible picture element) makes up a pixel.

Resolution – A measure of the number of pixels that can be displayed within a given area on the screen. Usually with monitor specifications, the maximum resolution is the number of pixels (vertical by horizontal) that can be displayed over the full screen area.

Dot Pitch – The size of the smallest dot that can be displayed. It is a measure of the degree of fineness of the holes in the mask in colour monitors.

TTL – Transistor-Transistor Logic.

RGB – Red, Green, Blue components of a colour video signal.

RrGgBb or RGBrgb – Red, Green, Blue components of an Enhanced Graphics Adapter video signal.

Driver Card – A printed circuit board that fits into an empty slot inside the computer. Different video displays require different boards with different drivers.

Text Display – With IBM compatibles, the text characters displayed are pre-defined in hardware. A Graphics display, on the other hand, displays images as groups of pixels, with the position of each pixel determined by software.

Scan Frequency – Horizontal and vertical scan rates are a measure of the number of lines per second that can be displayed. Multi-scan monitors can accept and display several different scan frequencies. □

Video band width is a measure of the number of dots per second that can be discriminated across a horizontal line. Monochrome monitors do not have a dot pitch specification because they do not require the image mask inherent in colour monitors. The higher the band width, the smaller the dots. Other things to consider when looking at monitors include the cable connections to the PC (usually a 9-pin D plug for digital displays, and for the PS/2 range, a 15-pin D plug).

The 'rated' size of a display can be misleading: the size is meant to be a diagonal measurement of the visible screen display area. Some manufacturers get a bit mixed up and specify the measurement of the monitor tube, part of which is hidden behind the front surround (but it sounds better and bigger, right?) Some monitors are supplied with their own monitor

stands, and some have non-reflective screens. Whatever monitor you are looking at, make sure you see one actually displaying the sort of text or graphics (or both) that you will be working with.

Sony CPD 1402E

Sony monitors have an excellent reputation among television and video professionals for display quality. Walk in to any video studio and chances are you will see not one, but several Sony monitors of various shapes and sizes. But the specifications for TV and video differ from those that apply to most PCs.

Sony has introduced the CPD 1402E Character Display Monitor that uses its

Mode	Maximum Resolution (pixels)	Colours	Input Signal
MDA	80 columns x 25 lines	mono	TTL Digital
CGA	320 x 200 640 x 200	16 4	RGB TTL Digital
EGA	640 x 350	16/64	RrGgBb TTL Digital
PGA	640 x 480	256/4096	RGB Analog
VGA	640 x 480 320 x 400	16/256,000 256/256,000	RGB Analog

Table 1. Display Modes for IBM compatibles.

Monitor	Price	Max. Resolution in pixels	Display Modes	Horizontal Frequency (KHz)	Bandwidth (MHz)	Dot Pitch (mm)	Signal Input
ADI DM-2214	\$1189	640 x 350	MDA CGA EGA	15.75 or 22	20	.31	TTL Digital RGB TTL Digital RrGgBb TTL Digital
Taxan SV-775A Multivision 770 plus	\$1729	640 x 480	MDA CGA EGA PGA VGA	15-34	30	.31	TTL Digital RGB TTL Digital RrGgBb TTL Digital RGB Analog
Wyse-700	\$2745	1280 x 800	MDA CGA	32	50	N/A	TTL Digital RGB TTL Digital
Sony CPD 1402E	\$2088	900 x 660	MDA	15-34	?	.26	TTL Digital RGB TTL Digital RrGgBb TTL Digital RGB Analog

Table 2. Monitors tested using a VEGA card for colour displays. The Wyse 700 has its own display card.

advanced Trinitron technology. This is a multi-scan unit that will accept RGB inputs within a range of 15 to 34 KHz horizontally, and 50 to 100 Hz vertically. It will display analog (PGA) and digital (MDA, CGA, EGA) signals, but not as yet VGA. (Sony is working on a cable that will display a VGA signal). In terms of specifications, it has the finest dot pitch (0.26 mm) among multi-scanning monitors, and a high resolution (900 x 660 maximum).

It uses a 14 inch Super Fine Pitch Trinitron CRT with a visible picture size of 13 inches, diagonally. The Trinitron system uses a different shadow mask, with fine slits instead of holes, and one gun instead of the three (RGB) usually found in colour monitors.

The screen is flatter than most, with a broad cylindrical curve. We found that

there was a small amount of red shift on the left side of the screen, giving characters a slight halo to one side. We've struck this problem with monitors before — the story is that it's caused by differences between the earth's magnetic field in the northern and southern hemispheres. The monitors are manufactured and adjusted in the northern hemisphere; when they are set up and switched on in Australia, they have slight convergence problems. Sony is working on it, we were told (and Thompson manufactures its monitors in Singapore, which is almost on the equator, to avoid the problem).

The Sony monitor has controls on the right hand side for power, contrast and brightness. Behind a flap at the rear are the controls for horizontal and vertical size/shift, and switches to set for RGB/ana-

log/digital input. With the switch set for TTL graphics cards on the IBM PC, AT, and XT, there is automatic adjustment between MDA, CGA, and EGA. The cable is optional, and there is a choice of cables depending on whether the input is analog or digital. A tilt-swivel monitor stand is also optional.

Taxan Multi Vision 770 Plus

This is another multi-scanning monitor that can display CGA, EGA, PGA and VGA. It can also display TGA, which is 640 x 400 pixels from the Taxan 557 Gold Card. The 14 inch display is closer to 13½ inches, with a dot pitch of 0.31 mm. The power switch, contrast and brightness controls are all within easy reach at the front below the screen. At the rear there are several switches and controls for selection of analog or digital input, colour or mono, vertical and horizontal size and position, and a panel of preset controls. The jumble of switches and knobs may appear confusing at first, but if the connection is to an IBM or compatible, the user simply selects between colour/mono, analog/TTL and the other switches remain in the Auto position.

An Overscan switch is provided to automatically adjust the monitor to give a full screen picture when different boards are used. With our EGA colour test on display, we noticed that the colour brown tended towards green, but this is a minor criticism, since colour judgment is subjective and there are usually small differences in the way manufacturers set the standard colours.

A stronger objection can be made about the slight wobble to the left of the display and the shift in focus towards the edges that makes the characters blurry. These problems are often encountered with the bargain basement monitors, but we did not really expect to see it in an expensive multi-scanning model.

ADI DM-2214

This is a high resolution monitor designed to display textural and graphic output from IBM or compatible computers. It has a maximum resolution of 730 x 350 pixels, and can accept two horizontal frequencies of 15.75 KHz or 21.85 KHz (auto-switching), so it is suited to

Which one?

It is really a case of making a decision on the software first. (In fact, this is the advice we offer for almost any hardware buying decision: find the software that does what you want, and then find the hardware to run it.) Then a choice can be made regarding display modes (whether or not you want colour, whether you will be using text or graphics or both), and then you can begin to look at the range of monitors to suit the display mode and software.

Prices vary within the range of \$200 for a very basic monochrome screen to below \$1000 for EGA, and the multi-scanning monitors range from \$1300 to above \$2000. If you wish to upgrade your system to include EGA, it may not be necessary to go out and buy a multi-scanning monitor that will display everything under the sun.

We found that out of the three colour monitors we examined, the best EGA display came from the least expensive unit. The ADI cannot be faulted, and it retails for \$1189 including stand and cables. Both of the multi-scanning monitors showed slight problems with convergence, and the Taxan also had focusing problems. It all goes to show that the most expensive is not necessarily the best. For an excellent text display, you could not go past the Wyse, but for a high resolution Cad or desktop publishing (DTP) display, you would have to make sure the screen drivers exist.

Other monitor suppliers

The monitors we have chosen to look at are but a drop in the peripheral ocean. As mentioned in the main article, most manufacturers are in the process of ex-

panding their product range to include more multi-scanning models, and ones that will accept the VGA analog signal. New high resolution monochrome monitors are also now being introduced for the DTP market. Here are some other suppliers if you'd care to see what else is available (ring them for the dealer closest to you) —

Thompson monitors — Peak Pacific, (02) 437 5566;

Samsung — George Brown-Amust, (02) 519 5855;

Moniterm — Megavision, (02) 957 5797;

EIZO — Megavision, (02) 957 5797;

Zenith — Zenith, (02) 417 7999;

Teco — Teco Australia, (02) 684 4277;

NEC — NEC Information Systems, (02) 438 3544;

We tested the three colour monitors using a VEGA board inside an Ultra AT which we had in the office for review. The VEGA board displays MDA, CGA, EGA and Hercules Graphics. The focus test consisted of a screen of fine patterned lines that allowed comparison between various areas of the display. Our colour test in EGA mode displays 16 colour slabs for comparison. It is difficult to show the true colours on the printed page because of the processing the picture goes through before you see it. But, there were no great differences in colour between the monitors, although the Taxan showed a slightly greener brown than the others.

Text mode was examined using Word-Star Release 4. The Wyse 700 has its own display card and to have software running in the high resolution modes requires special screen drivers, some of which are supplied with the monitor.

MONITORS

Wyse 700

both CGA and EGA display modes. It has a diagonal visible screen measurement of 13½ inches. The screen is curved and it has a plain surround that does not produce too many distracting shadows.

Slide controls for contrast, brightness and colour select are placed out of the way, but still within easy reach beneath the front surround. The colour select control is used to switch between colour, amber or green. There are no user controls for adjustment of horizontal or vertical shift or width, which means that they have probably been set in the factory. Colours in graphics applications look up to standard, and text displays well in the EGA mode. The amber and green settings, when used for monochrome text display (but still under EGA mode), made the screen too dark and difficult to read in a room full of light.

The ADI monitor has an excellent display with good contrast and a good dark black can be obtained for the background and surround. It is assembled in Taiwan, using a Japanese picture tube. It comes complete with a tilt and swivel base, and cables. The only negative thing that could be said about it is that the amber and green displays are too dark, but with EGA or CGA you may as well enjoy the colour!

There is little point in having a colour monitor if your work is purely involved in with text or monochrome graphics. Recently, with DTP becoming popular, many manufacturers have produced ultra-high resolution monochrome monitors in a variety of sizes. The largest ones can display the equivalent of two A4 pages side by side, so that the user can get an idea of how a document is going to look before it is printed. Resolutions are as high as 1600 x 1200 pixels, and they have flicker-free paper white backgrounds with crisp, clear characters. Cad applications and wide spreadsheets can also benefit from a larger than normal, high resolution display.

The Wyse 700 can display a maximum of 1280 x 800 pixels. It has a 14 inch diagonal display and can accept MDA and CGA signals. The monitor is supplied with a display card that fits into a full length slot. Modes can be selected via the DOS Mode command, or by using the Screen command from the Utilities supplied on two disks with the monitor. Even in it's lowest resolution, the 700 displays alphanumeric characters using cells of 16 x 32 pixels,

compared to the standard IBM CGA 9 x 14. This makes the characters in an 80 character x 25 lines display look better defined than on a standard MDA screen. The edges of the letters are sharp and there are no scan lines running through them.

In CGA mode, the colours are transposed to four shades of grey by the display board. In high resolution modes, it is possible to select between three text modes (80 characters by 50 lines, 160 characters by 25 lines, and 160 characters by 50 lines). High resolution graphics can be selected from 640 x 400 pixels, 1280 x 400, and 1280 x 800. The high resolution modes require programs to have display drivers to handle the resolution before they can run with this set up.

The monitor itself is a pleasantly designed, compact unit with a builtin stand and one control for brightness at the front. The black and white display is crisp and sharp, and although the display is interlaced, there is little flickering. The manual is reasonably informative, and the Utilities disks provided have additional fonts, drivers, a screen saver and a screen mode selector. There are also some demonstration screens with DTP and Cad images shown in full hi-res glory. □

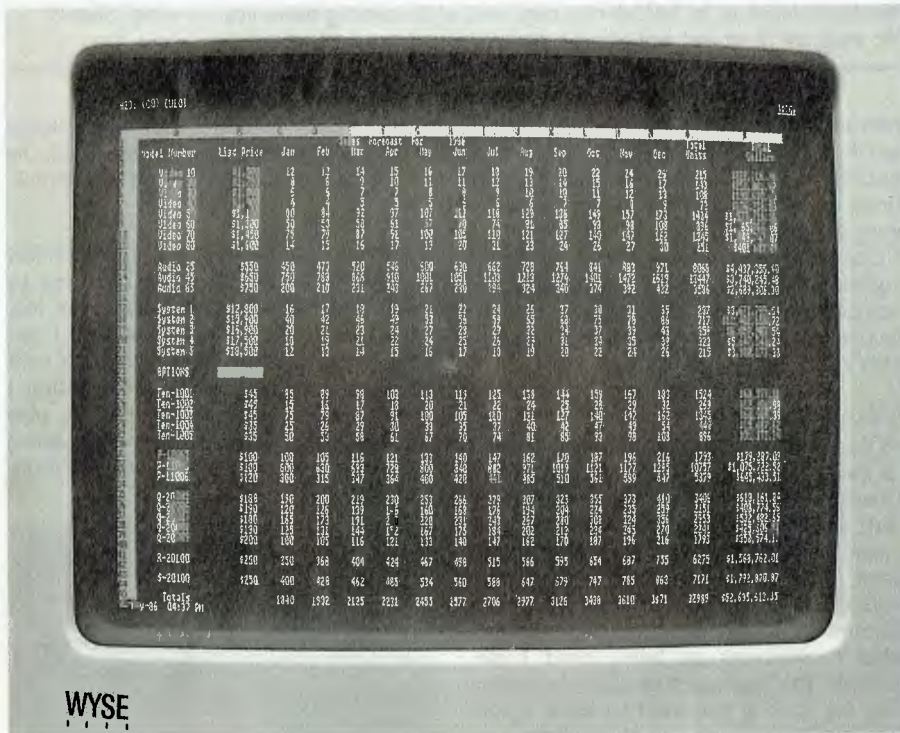


Figure 4. The well-proven Wyse 700 is a monochrome monitor that can display up to 1280 x 800 pixels.

Product Details

Product: Sony CPD 1402E
From: Sony Corporation
(02) 887 6666
Price: \$2088,
Stand \$78

Product: Taxan Multivision 770 Plus
From: Kaga Electronics Co
Distributor: Tech Pacific 119 Ferrars St,
Sth Melbourne 3205 Vic.
(03) 690 9055
Price: \$1729

Product: Wyse 700
From: Wyse Technology
Distributor: Imagineering, 77 Dunning
Ave, Rosebery 2018 NSW
(02) 697 8666
Price: \$2745

Product: ADI DM-2214
From: Advanced Data Information
Distributor: Imagineering, 77 Dunning
Ave, Rosebery 2018 NSW
(02) 697 8666
Price: \$1189 including stand.
(All prices taxed.)

Turbo-Bridge

AMSEC consultant Bert Mond, says that Bridge enthusiasts will enjoy Turbo-Bridge – but he doesn't rate it as highly as BridgePal.

THE VERY FIRST computer program I reviewed for *Your Computer* was BridgePal, a computer Bridge game not unlike Turbo-Bridge. Some of the comments made in the earlier review (Feb. '88) are applicable here. Specifically, if you enjoy the challenge of an interesting Bridge hand (as distinct from conversation with other Bridge players) you may find that whenever you have a few spare minutes (or hours) you are rushing to the computer to play a few hands.

The similarities notwithstanding, there are substantial differences between these two Bridge games. These differences are primarily in the various options offered. Bridgepal seems to offer far more useful options, for example, replaying the same hand when the play of the hand is complete.

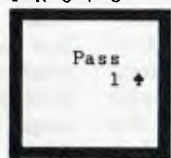
Options

Some of the options offered by Turbo-Bridge are the following: in addition to playing South you can also elect to play any or all of the other three hands. You can choose to have all four hands displayed on the table during play. Finally, there is an option at the opening menu that I find most intriguing. You are asked 'Should the program cheat and look at your cards?' Does this mean that if you say yes, the computer doesn't have to fess up since it already knows who has the missing card? If so, why would anyone choose such an option? There are people who cheat at Bridge, but for themselves *not* for their opponents. I did try this op-

TURBO - BRIDGE

West 13 + 1
 ♠ A Q J 9
 ♥ 6 2
 ♦ Q 6 4
 ♣ A T 3 2

North 9 + 2
 ♠ 5
 ♥ A Q 9 4 3
 ♦ T 5 3
 ♣ K 8 7 6



East 12 + 1
 ♠ K 7 4 3 2
 ♥ K J 5
 ♦ K 9
 ♣ Q 5 4

South 6 + 1
 ♠ T 8 6
 ♥ T 8 7
 ♦ A J 8 7 2
 ♣ J 9

North East South West
 Pass 1 ♠

ClearBids NewDeal
 Score eXit

South:

Bid Number of Tricks 1..7
 Double Redouble Pass

Figure 1. Turbo-Bridge offers a number of options: in addition to playing South, you can also elect to play any or all of the other three hands; or, you can choose to have all four hands displayed on the table during play; and, at the opening menu you are asked 'Should the program cheat and look at your cards?'

tion and found that the computer played much faster when it had been instructed to cheat. (Presumably, it does not have to think as much when it has already seen your cards.) So there is an advantage in choosing this option, in other words it speeds up the game, although I am still not quite certain of precisely how this selection changes the way the computer bids and plays.

Documentation

This perhaps leads to another significant difference between the two disks. The documentation for BridgePal is on the disk, so that one knows what the options mean and what conventions are being used. This is not the case with Turbo-Bridge. As a result, it takes a certain amount of trial and error to determine what conventions are being used. I did learn in this fashion that four no trump asks for aces. If you want to know if the computer recognizes, say, short clubs, you just keep playing until the answer becomes clear from subsequent responses

to such bids. Alternatively, if you know enough Turbo Pascal, you can read the source code which is provided on the disk.

My choice

Which of the two games do I prefer? Both can be played and enjoyed by the Bridge enthusiast and there are features unique to Turbo-Bridge that I like (such as automatically playing your card for you when no choice is possible.) Nevertheless, I will usually elect to play Bridgepal rather than Turbo-Bridge, since the former seems to have more of the options that I find useful. □

AMSEC

This review was prepared for AMSEC by Professor Bert Mond of the Mathematics Department at the La Trobe University. AMSEC is an Australian software evaluation group with consultants in the workplace, in schools and in tertiary institutions around Australia. It can be contacted at PO Box 140 Hurstbridge 3099 Vic. or PO Box 1339, Armidale 2350 NSW.

Product Details

Product: Turbo-Bridge,
 PC-SIG Disk 890
From: Manacomm Pty Ltd, Freepost No. 29, PO Box 509, Kenmore 4069 Qld (07) 374 1311
 Viatel *49000#
Price: \$13 per disk plus \$5 postage and handling.

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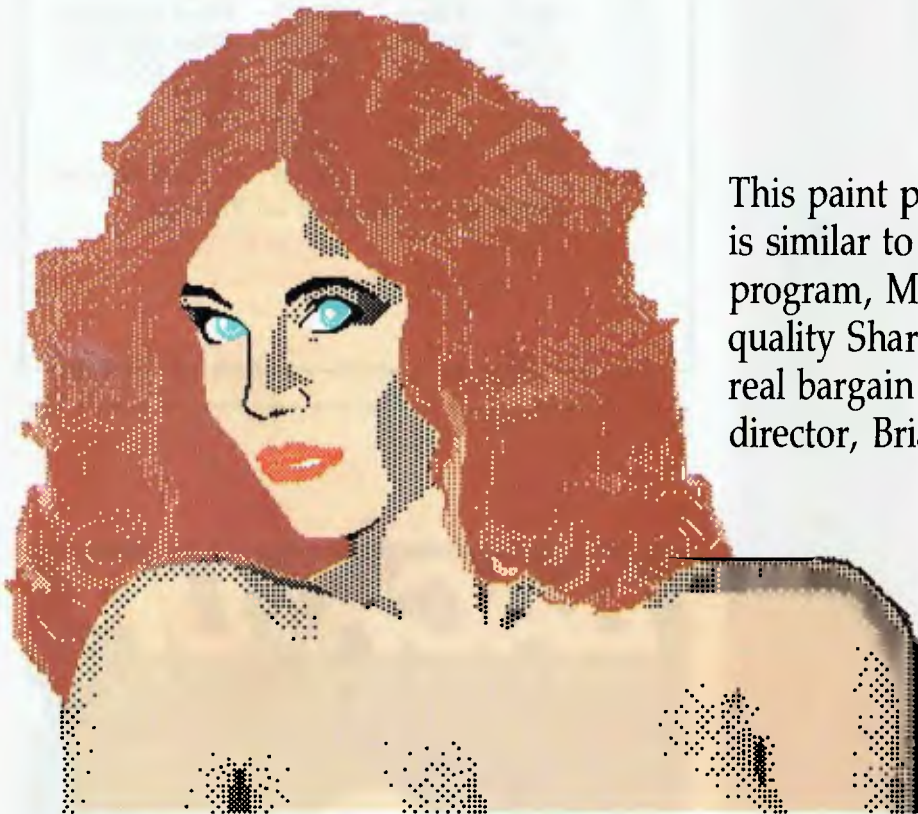
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Finger Paint



This paint program for the IBM PC is similar to the popular Macintosh program, Mac Paint, but it's a high quality Shareware product that's a real bargain at the price, as AMSEC director, Brian Davey, reports.

THE FIRST PC that I used was a Macintosh and the first program that I used on it was Mac Paint. In fact, at that time it was almost the only piece of software available on the Mac. Mac Paint helped to reveal the power of the whole Macintosh concept. Nevertheless, when the time came I, like most of my colleagues, chose to buy an IBM clone rather than a Mac. The reasons for this choice were various, but my main regret was that programs like Mac Paint would not be available to me. Before too long, mouse- or keyboard-driven paint programs became available for the IBM PC; but at a price beyond my means. Now there's Finger Paint.

Finger Paint is a Shareware product. Version 1.0 is available in Australia through distributors of PC-SIG Public Domain software. The Public Domain version is complete except that the printer driver is disabled. On the disk you are invited to send \$US7.00 to Poisson Technology in return for a version with a printer driver. This information is out of date as the program is now up to Version 1.30 and a registered copy with a printer driver now costs \$US19.99. It's worth every cent of it and more!

Let me point out the differences between versions 1.0 and 1.30. The most important difference is that while a mouse is not required for either version, Version

1.30 fully supports the use of a mouse. Version 1.0 is written for a CGA card and screen but includes a separate CGA emulator for the Hercules card which allows it (and other CGA programs for that matter) to run on a Hercules screen; it runs on an EGA screen in CGA mode. Version 1.30 fully supports CGA, EGA and Hercules screens in two colours.

While the CGA version is quite acceptable given the limitations of the screen, the EGA version is really impressive. The printer driver in Version 1.0 supports only Epson compatible dot matrix printers, while the latest version supports over 160 dot matrix and laser printers.

In Version 1.0 every page of drawing is saved as a 25 kilobyte file. Version 1.30 saves on disk space by saving pages in a compressed form – my drawings have required between 5 and 20 Kbyte – but is able to read the uncompressed files created with Version 1.0. Finally, the arrangement of the screen is slightly better in the latest version and includes the file name on screen. A cut down Version 1.30 with a half-page laser printer driver, but no support for dot matrix printers, has

been released into the Public Domain in the States but hasn't made its way to Australia yet.

Each workpage is 537 x 750 pixels, with 537 x 238 pixels on screen at any time, and when printed fits onto 8.5 by 11 inch paper. Across the top of the screen is a typical Lotus-type menu bar: one moves forward through the menu by pressing the first letter of one of the displayed words (Edit or Curve, for example) or by using the left and right arrow keys to highlight the word and then pressing enter. The Esc key always moves back to the previous level in the menu tree. There are 29 commands in the menu tree and 20 of these are represented by icons down the left of

Figure 1. It is possible to use Finger Paint to present an on screen slide show by using the Demo command. Eight demo files come with the program including a photograph of Madonna.



the screen. These may be activated by a click on the mouse or by pressing a function key with or without the Alt key. For safety's sake, clearing the current page cannot be done via the mouse or function keys but must be done through the menu bar.

Across the bottom of the screen there is useful status information including the co-ordinates of the cursor, the present font style and size for text, the position of the screen relative to the complete workpage, the present page number (1 or 2), whether Fill is on or off, and (in Version 1.30) the file name. The 40 possible fill patterns are also illustrated along the bottom of the screen, a choice being made via a click on the mouse, a function key or the menu bar. In the bottom left hand corner is an icon indicating the present line width.

It is possible to use Finger Paint to present an on screen slide show by using the Demo command which presents in order the files DEMO1.PIC, DEMO2.PIC, up to DEMO200.PIC. Eight demo files come with the program, including a photograph of Madonna.

Graphics

A list of the 20 commands available via the mouse or function keys, are described in the on-disk manual. All the usual drawing commands are there, including straight line between two points, multiple straight lines with the same starting point, rectangle, circle, oval, free-hand drawing with the mouse or in eight directions with the keys on the numeric key pad, and splines and blines (which are curves obtained by bending a straight line). Of course, the screen can be painted or sprayed, with a choice of 14 different brush shapes, and enclosed areas may be filled with one of the 40 available patterns.

Turning Fill on results in closed shapes

being automatically filled with the current pattern. It is possible to cut, paste or move part of the picture, to undo the last command, or to magnify an area and turn individual pixels on or off (equals Fat Bits in Mac Paint).

When pasting it is possible to flip the pasted rectangle vertically or horizontally, to invert the shading so that black becomes white and *vice versa*, to make the white areas of the rectangle transparent, or any combination of these. It is possible to load two different pages (files) into memory and edit them together, swapping between them instantly. For example, an area may be cut from one page and pasted into the other.

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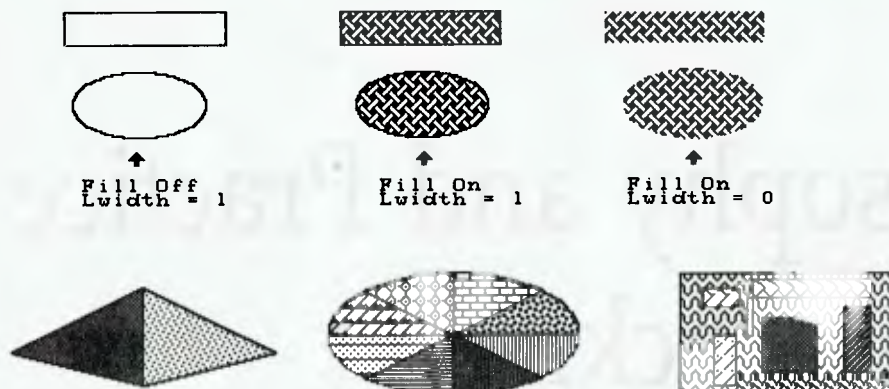
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GRAPHICS



Use **FLUSH [ALT F7]** to fill in patterns.

Figure 2. Turning Fill on results in closed shapes being automatically filled with the current pattern. It is possible to cut, paste or move part of the picture, to undo the last command, or to magnify an area and turn individual pixels on or off.



Text

Text may be entered at any point on the page and may be entered over the top of a drawing, though the interaction between the text and the graphics can make the text somewhat illegible. I found the best way to place text on top of a drawing is to type the text on a clean part of the page (or on page 2) and then use cut and paste to move it to the desired position. Choosing the Transparent option when pasting results in legible text on top of the drawing; only the actual character itself will cover up the drawing, not a rectangle containing the character as would happen on a graphics screen in Basic, for example.

There is only one font available at this time, though other possible fonts are shown on one of the demo pages on the disk. Nevertheless, there are 9 possible scalings both vertically and horizontally producing 81 different sizes for the one available font, which is not bad.

As mentioned earlier, hard copies of drawings are possible only with registered copies and not with the Public Domain version. Version 1.30 supports over 160 laser and dot matrix printers including all HP LaserJet, Epson FX, and IBM Proprinter compatibles. All the printers on which Finger Paint has been tested are listed in a file on the disk.

On my bottom-of-the-range Star NX-10 printer the quality of the printing was very good but was fairly slow – the same speed as a graphics screen dump. Not surprisingly printing with an HP LaserJet produced excellent results. A message on screen when using a laser printer says that it will take 2 minutes per page. In fact, it took 5 minutes when driven by an old IBM PC and 3 minutes 40 seconds when driven by an XT clone. Perhaps the 2 minutes refers to an AT – I didn't have an opportunity to test it. To speed up the printing, there is no error handling routine so, for example, you have to make sure that the printer is on line before printing.

File management is the only aspect of Finger Paint where there is obvious room for improvement. In both versions under review the name of the current directory can be displayed, the current page can be named and saved to disk or a page already saved can be loaded for further editing. You are warned when saving a page which

already exists on the disk in case you wish to change the name in order to keep the original as well.

It is not possible to list the files in the current directory nor to change the current directory. The ability to list files and choose, directly from the list, one of them to load (by highlighting it then pressing Enter) would be a major improvement. As it is, you must know in advance the name of any file which is to be loaded from the disk.

Files are not saved automatically on quitting, loading a new file, or running a demo, so some care must be taken not to lose the workpage in the process.

Finger Paint is typical of the best Shareware products – it is a high quality product which could cost four or five times as much to buy commercially. There is a very brief manual on the disk, but like my eight-year-old son, Evan, you can quickly become expert at Finger Paint without ever looking at the manual. Finger Paint is highly recommended and will be even more so when extra fonts become available and file handling is improved.

By the time you convert \$US19.99 into Australian dollars and add bank charges, a registered copy of Finger Paint will cost you about \$A35. It's a bargain at the price; but if you'd like to try it out first, you can (legally!) get a copy of the Public Domain version from a friend or buy it from a distributor. I'm sure you'll be impressed. □

Product Details

Product: Finger Paint 1.0/1.30
From: Poisson Technology,
 816 Gregory Ct, Fremont CA 94539,
 USA

Distributor: SME Systems,
 22 Queen St, Mitcham 3132 Vic.
 (03) 874 3666

Price: Available from SME to members only: membership is \$30 per year (plus \$10 joining fee), which includes a 140-page catalog and newsletter; \$5 per disk, \$6 by post.

AMSEC

This review was prepared by AMSEC director Brian Davey. AMSEC is an Australian software evaluation group with consultants in the workplace, in schools and in tertiary institutions around Australia. It can be contacted at PO Box 140 Hurstbridge 3099 Vic. or PO Box 1339, Armidale 2350 NSW.

The Philosophy and Practice of Hacking

IT'S A SHAME, really. Back in the good old days (five or six years ago in computer terms) the term 'hacker' was reserved for very clever people only. Hackers were the ones who wrote the first operating systems for small computers. The traditional 'computer professionals' said hackers could never make their 'toy' computers do anything truly useful. Microcomputers were made for video games, and little else.

But then, end users started taking micros seriously. The hackers smiled, and the professionals squirmed. Their air conditioned, temperature-controlled, ultra-secure mainframe computer centres were under threat from a little gray box sitting on someone's desk. Now a lowly paid clerk could do work that previously required a computer science specialist. Not good!

Today the term 'hacker' has taken on a meaning totally opposite to the original. Charitable people rate hackers with politicians and used car salesmen on the social scale of life. People with a less generous outlook (and this includes 'computer' writers in the popular press) feel hackers are simply criminals. The hacker's mission in life, as seen by the general population, is to rip the funds out of some insurance company's computer (there was a good television series about that!) or more likely, to start World War Three (did you see the film 'War Games'?). The popular hacker traditionally has a modem at his side through which to spread his vile attacks on the poor innocent mainframes of this world.

I sometimes wonder if 'mainframe' isn't the important word here. The general public has now been educated to see mainframes, in big computer centres, as the victims of hackers. Remember that in the early days, computer centers saw

READ.ME! This article was written for you, the reader with a general interest in computers. It was not written for other hackers (that would be preaching to the converted, wouldn't it?). If you'd like to know what goes on beneath the skull of that bleary-eyed freak who mumbles hexadecimal bytes in his sleep, you'd better let Tom Moffat fill you in . . .

themselves under threat when they found that their kind of work was being done by a high school kid with a TRS-80. Could the 'hate the hacker' campaign be some kind of retribution?

Yes, my friends, today's hacker is certainly a slime. I was once involved in the production of a book called *The Microbee Hacker's Handbook*. It was displayed and sold with all the computer magazines on the newsagents' shelves. It used to be good fun to walk into the midst of the browsing lunchtime crowds, point at the *Hackers Handbook*, and then say to a friend, loudly: 'I HELPED WRITE THAT!'. The effect was as if I had just eaten a big lunch of chili and beans and then dropped

a rude smell. People would put their magazines back on the rack and then shuffle to the left and shuffle to the right, so I soon had a clear space of one meter all around. The book, of course, was quite innocent; mostly reprints of Microbee related articles from *ETI*. But with a title like that, it should have been sold among the porn, I had the feeling, in a plain brown wrapper.

The truth of the matter

Perhaps hackers are like witches: there's good ones and there's bad ones. From now on we'll concentrate on good hackers, who instead of trying to start World War Three, are trying to squeeze the last ounce of performance out of their own micros.

If you ever read *Byte* magazine you'll probably know of a columnist named Jerry Pournelle. He's got a Doctorate in something-or-other, he writes some pretty passable science fiction stories, and he gets so much software sent to him for review that he actually claims to throw some of it away. The fellow is really a self-made guru, with his own cult following, and I've even noticed writers in some of the Australian magazines trying to follow his style (or even parodying it: see 'Cameron Manor' in *YC Feb.'88*). Pournelle calls his home 'Chaos Manor', and each of his computers has a given name, like a member of the family. I suppose I give my computers names too, but only when pacing up and down in front of them hurling abuse. The names never stick for long.

The reason I mention Jerry Pournelle is that he has a unique way of describing something he thinks is particularly clever and elegant. He calls it a 'neat hack'. I feel that would be the best compliment that could be paid to someone's prize program or gadget: a neat hack. I've been writing a

feature about WordStar this week. I couldn't have said so in that article because it would have been taken wrongly, but I think Wordstar is a 'neat hack'. I would also suspect that it was originally written by dedicated hackers, judging by the performance it produces in such a tidy package.

Get the idea? The real meaning of 'hacking' today is to strive for performance or results that are beyond what's normally accepted as the state of the computer art. The traditional programmer will produce a software product by sitting at a spotless desk, typing in line after line of carefully structured statements. The programmer may even be part of a team, to the extent that he wouldn't get any idea of the overall 'feel' of the finished product. It's a sad fact of life that those jobs pay the biggest bucks.

The hacker, on the other hand, usually works on his own. Each line of new code presents a challenge: How can I soup this up a bit?. Hackers won't usually accept the restraints of 'structured' programming in high level languages, and frequently descend into machine code to make the computer do things their own way. Some hackers get so hooked on this that they write the whole bang lot in machine code.

Hackers sometimes wind up with truly brilliant programs (neat hacks) but they bog down trying to sell them. Commercial nous is not among their attributes. But software companies seem to be getting the message now, and some of their ads proclaim 'written entirely in assembler'. It's likely such products have felt the touch of the hacker and would be my first choice to look at!

Why machine code?

Working with machine code (assembler) is much like driving a car with a manual transmission. *You* are in absolute control of what's going on. High level languages are more like cars with automatic transmissions; they do their own thing when they want to, and most times you don't even know what gear they're in. Of course, many people don't care what gear they're in, and that's fair enough. You don't really need that information to drive the car, and you can then exert more of your effort getting from Point A to Point B instead of working out the minor details of driving.

I'd say most many machine code programmers do it for the sheer fun of it, and the satisfaction of being in total control of



HACKER AT ONE WITH COMPUTER...⁸²

the computer's microprocessor. Others stick with machine code out of habit, or pure laziness! I, for one, haven't ventured into the up-market realm of the C language, mostly because I just can't be bothered. I know I should learn about such things to keep up with the 'state of the art', but when a programming project comes along I just naturally reach for the Assembler disk and rip right into it. Perhaps I should get my wife to hide that disk for awhile so I'll spend my time learning something more civilized.

In the early days there weren't any disks to worry about. My first computer was a Dream 6800 kit, courtesy of *Electronics Australia* magazine. It had a high-level language called Chip-8 and a gigantic 1K of RAM. Communication with it was through a keyboard (actually an array of buttons) that spoke hexadecimal only. But that little machine got me well and truly hooked.

It didn't take long to discover that 'Chip-8' was simply a collection of machine code subroutines, and the Dream could be made to do all sorts of wonderful

things by bypassing the Chip-8 interpreter and calling its routines directly. The next step, naturally enough, was to try to improve on the builtin subroutines by substituting 'user-written' ones.

There was no assembler of course, all this stuff was 'hand-coded'. You sat there with a photocopied sheet containing all the 6800 processor instructions and their machine operation codes, and wrote them onto a piece of ruled paper, one by one. If you had to enter an instruction between two others, you erased every instruction below the new one and then re-wrote them. The last step was calculating all the branch and address values. Finally you'd type in the machine code on the hex keyboard, test it out, and then try to figure out what had happened when it crashed!

If you spent enough time at this, you'd eventually memorize most of the machine operation codes. Your brain then became the assembler. I can still recall, ten years later, that '86' meant 'Load Accumulator A' and 'A6' meant 'Load Accumulator B' (I think). And '39' returned you from a subroutine.



A lot of people still look back to these 'good old days' of machine code hacking with a nice warm feeling. So much so, that several of us have decided to bring our old Dream's along to the next meeting of the Hobart Microbee/IBM Users' Group. Many of the group's younger members have never seen a hexadecimal keyboard, or a fast game of Life!

When the Microbee came along, lots of Dream owners got them. The Microbee actually ran Basic; it was a 'real' computer! I took the plunge and spent an extra fifty bucks on an 'Editor/Assembler' Eprom option. I wasn't really sure what it was good for, but the chip did include a ma-

chine code monitor so I could enter my much-loved hexadecimal machine code. I just hoped the mysterious Editor/Assembler wouldn't get in the way of my machine code activities.

Ah well, the penny finally dropped, and I found that you could type the *English words* for the microprocessor instructions into the Editor/Assembler, and the program would look up the machine code for you and work out the branch addresses. And you could even insert new instructions between existing ones, and EDASM would make room, generate new machine code, and calculate new branches. Ripper! I was gone! No more photocopied sheets

of machine instructions, and no more trying to memorize the codes (which was extra-good because there are some 700 operation codes in the Z-80 instruction set). But because of that miserable EDASM chip I never did learn to program in Basic properly. A machine code dunce, that's me...

Hacking your way into other people's programs

That isn't as bad as it sounds, and in most cases is quite legitimate. If a dedicated hacker uses some program such as a game long enough, especially if it's a good one, he'll start to wonder how it works. The hacker wants to learn something by example, and the program's author should feel flattered that the hacker admires it enough to take it apart. There are several ways to get into such a program. One is to use a standard 'debugger' program, such as DDT for CP/M systems, and DEBUG for MS/DOS. These act like the 'Monitor' program on the original Microbee, letting you inspect and change hexadecimal machine code bytes.

You can deduce a lot from hexadecimal 'dumps', especially when the display includes ASCII representations of the hex bytes as well. Any text or messages are instantly decoded and seen. But it's a very laborious process to nut out machine code instructions this way. Both DDT and DEBUG have rudimentary 'disassemblers' which do just the opposite of 'assemblers' - they turn machine code instructions back into English words describing the instructions.

As a personal hacking project, I wrote my own disassembler that is easier to use than the one in DDT and it disassembles the entire Z-80 instruction set. SMASHER.COM is a memory-resident program in the IBM style; it sits in the top of memory from where it can reach out and disassemble anything else in the computer including the roms. Smasher allows you to cruise around in memory, following subroutine paths, and it remembers the address to return to after the subroutine.

I've arranged for SMASHER.COM to be put on the *Your Computer* Bulletin Board for any of you Z-80 people who would like to look around inside your machines. It was written for the ZCPR operating system in which you can start a program from the Dos prompt with the JUMP command. Smasher should work in most Microbees, and possibly other CP/M systems as well.

Changing things

This subject could be a bit controversial: should you or shouldn't you change things? Some software suppliers say the program you bought remains their property for all time. You are only renting it! So if you make changes to it, you are violating their rights. It would be interesting to know the legal position.

I think the more common view is that once you've paid your money for your own copy of the program, you can do with it what you want. If you can customize it to make it better for your own purposes, why not? Some software suppliers, such as MicroPro with their WordStar, provide special facilities so users can customize their own software. But others seem to lock their programs up tight as a drum!

Here's an example of what I feel is quite a legitimate hack: a former employer of mine had an IBM PC and a well-known Cad program to produce drawings of his products. This Cad package had a large selection of driver 'software attachments' that looked like they could cope with just about any printer made. One of these

drivers was for the Epson MX series of printers.

We had a printer that was claimed to be 'Epson compatible', but like so many 'compatible' printers, it wasn't. Its graphics aspect was too narrow and it was unable to stick to a specified line feed pitch. So a hack was necessary, not because of a fault in the Cad package, but because of design troubles in the printer.

This was a job for DEBUG. We used it to read in the 'Epson' printer driver. DEBUG was then told to search for the printer command code for 'double density graphics'. We changed the code to 'single density graphics'.

We were fortunate to find that there was a bit of unused space just before the printer graphics command, and we used it to insert the line feed pitch command so that it would be sent anew for each line of graphics. After these modifications the printer produced usable 'check plots' of our drawings. Without hacking the Cad package, I suppose we would have had to buy a new printer!

Getting started

If you've read this far, you probably want to have a little go yourself, just to get the feel of some mild hacking. You will probably have DEBUG if you're an IBM user, or DDT for CP/M. Get out your DOS manual and read up on how to use your debugger. Then use it to read in some little .COM program you might have, perhaps a simple utility, and have a snoop around. Try the hexadecimal dump, and then the disassembler.

You will soon encounter the instruction 'INT 21' in an MS-DOS program, or 'CALL 5' in CP/M.

You have just opened the door to all the builtin subroutines in your computer. They do such things as write a character to the screen, get characters from the keyboard, or access the disk drives. Before accessing 'INT 21' or 'CALL 5', you must set up one of the microprocessor's registers with some number which tells DOS which function you want to use. INT 21 and CALL 5 are the channels through which you enter the DOS functions, your function number in hand!

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POPULAR PRESS VIEW OF THE HACKER... ©STA.88...

Still interested? Good. Get ready to spend some money, because you are going to need some books. You will need at least two books, the first to tell you how to use the microprocessor's machine code instructions. You will probably find one instruction per page, explained in great detail. Another book you require will describe the DOS functions, with one or more pages set aside for each one. It is also possible as you become more expert to bypass DOS and get into your machine's BIOS directly; the BIOS calls are also described in the IBM books.

Instant book review time, first for CP/M users: For the machine code instructions, *Programming the Z-80* by Rodney Zaks is the classic. I'm now on my second copy of this book, the first having worn out from so much use. It simply fell apart. Another good book is *Z-80 Assembly Language Programming* by Lance A. Leventhal. Its instruction descriptions aren't quite as clear as those in the Zaks book, but it has vital information dealing with input/output programming and interrupts. I use both books.

DOS functions: If you've got the proper Digital Research CP/M manual, it describes the various functions under CALL 5. But many computers, such as my Micro-

bee, came without the full Digital Research documentation. I have a book called *The Osborne CP/M User Guide* by Thom Hogan. This is a little beauty covering all CP/M matters including CPM/86 for the IBM PC. I got this for \$2 from a shop named after that well known helicopter pilot. They thought it applied to Osborne computers only and was therefore useless to most people. Actually Osborne is the name of the publisher - we all get lucky sometimes! Another book from the same publisher, describing the function calls in great detail, is *The Programmer's CP/M Handbook* by Andy Johnson-Laird.

Now for MS-DOS users, some machine code books: *Programming the 8086/8088* by James Coffron comes from the same publisher (Sybex) as Zaks' Z-80 book. But I'm afraid it doesn't hold a candle to Zaks. Each instruction has its own page, but there's no information on the time taken for each instruction, and worst of all, it's got bugs! For instance, on page 89, the description of the 'Divide' instruction has the functions of the AL and AH registers reversed. It took me ages to find out why I couldn't make the DIV instruction work. How many more mistakes are there?

Another book I keep referring to all the time is *8088 Assembler Language Program-*

ming by Willen Krantz. It's got nice information on direct machine code manipulation of the IBM's hardware such as the video card and various input/output features. In the back is a list of the machine instructions, with timing information this time, but there's no detail on the actual machine codes, so you don't know what to expect when looking at a hex dump of the code using Debug. I find I have to use both books, side by side.

In the area of DOS functions, IBM users are indeed fortunate to have a couple of really glorious books available to them. *Advanced MS/DOS* by Ray Duncan comes from Microsoft Press at a most attractive price. Those people really know how to support their users! Duncan's book describes programming activities in various areas of the computer such as file handling and input/output. These are illustrated with big chunks of actual assembly language. Then comes detailed descriptions of the DOS and BIOS function calls, again illustrated with programming examples. A neat hack!

To complete your library you might want *The Peter Norton Programmer's Guide to the IBM PC*, again from Microsoft Press. You'll know this book by the large picture of the great man himself on the cover, looking smug. Ah well, I guess he has a right to: it's a great book, especially for hackers who want to hit their hardware right square in the memory address. An early subject covered is what's in the Roms, and how you can fiddle with the Rom data area in low memory. For the uninitiated, this is a good source of some truly monumental crashes, so watch out!

Norton's book seems to be the one to use when working with BIOS functions, while I prefer Duncan's while working with DOS calls. In other words, the two books complement each other, although either one would do the job.

One thing I haven't yet seen is the 'Norton Guides' on-screen help utility for IBM assembly language programming. Apparently it sits there in memory waiting for you to press a 'hot key' as in SideKick. If you want information on how to write a character to the screen, you press the magic button and your computer tells you how to use Function 2 of Interrupt 21, right there on the screen.

Saves sitting there with the open book on your lap, picking it up from the floor every time it slips between your legs. (Maybe that's why my computer books keep falling apart.) If I can lay my hands on a copy of this 'Norton Guides' gadget I'll let you know how it goes. □

Parsing a filename with Turbo Pascal

The star dot star (*.*) and question mark (?) allowed in filenames in DOS is a very convenient way of grouping files together. This is great if you do all your programming work in DOS, but who does? Here's a fairly painless method for parsing a command line in to its component parts, compliments of Peter Nolan.

TURBO PASCAL will not acknowledge the star dot star or question mark when you try and assign a file group, so you are left to your own devices. For quite some time I have been putting off the job of writing a filename parsing routine that will take the user's input, including star dot star and question marks. That all changed just recently as I had a job that forced me to sit and think about it.

The problem didn't sound very great at first, but the further I went in to covering all the possibilities, the more complex the resulting program code became.

There are many combinations to indicate the same file in the same path that a user could legally enter. The job of breaking these down with compact and fool-proof code became quite a challenge. Take for instance the following commands that *all* relate to the same file in the same directory. I have assumed, of course, that the user is typing in the command whilst logged to the directory called in this instance DOS in the ROOT directory of drive C: -

```
copy MYTEXT??.* B:\*.*
copy MYTEXT*.* B:\*.*
copy MYTEXT??.* B:.*.*
copy MYTEXT*.* B:.*.*
```

```
copy C:\DOS\MYTEXT*.* B:\*.*
copy \DOS\MYTEXT??.* B:\*.*
copy C:\DOS\MYTEXT*.* B:.*.*
copy \DOS\MYTEXT??.* B:.*.*
```

There are more combinations than this and the ambiguity creeps in with the more implied instructions that are entered. Because the wildcard features are legal in DOS then we must be able to encompass all of DOS's combinations. Both stated and implied. So, what first may appear as pretty straightforward turns out to have some fairly complex requirements. I hope I have covered all of the possibilities in the following code. I fell on my feet (as the saying goes) in one respect whilst developing the routine for extracting the filename from the full string offered by the user.

You will notice from the above examples that the filename is always the last item in the command line. It suddenly occurred to me to first strip off the filename into a separate string by starting

at the end of the line, and building the name from right to left instead of vice versa as you would normally do.

OK - let's be a bit more logical in describing the process. One thing to note though, I have *not* used any tricks in an attempt to speed up the processing of strings. The reason is to maintain compatibility between the different versions of Pascal. You may, if you wish, use the byte zero technique for manipulating string length - but Turbo Pascal version 4.0 will have nothing to do with it. Hence no tricks, and besides I am not a great believer in making things go faster at the expense of program readability. The saving of 1000th of a second by cutting one byte from the end of a string, is a wasted exercise unless you need to do it to a thousand strings at once.

```
delete(Strg, length(Strg), 1)
```

Interested in Turbo Pascal?

Got any hints tips or ideas you'd like to share with other Turbo Pascal users? Or maybe you've discovered (or written) a great new program you'd like to tell others about - if so, send them (on disk) to *Your Computer, PO Box 227, Waterloo 2015 NSW*. Please include a printout of the disk and caption any illustrations. Unfortunately, because of space limitations, we cannot publish listings over 200 lines long.

In his 'Turbo Tips' series, Peter Hill offered a review of Turbo Power Utilities (May '88); 'The dBase Connection' and 'More dBase Connections' (Sept. '87 and Feb. '88) and a PATH utility (Mar. '88). The occasional series started in Dec. '86 with 'Twenty Turbo Tips' and included 'Windows with Turbo Pascal' (June '87).

We'll forward photocopies of one to five parts of these, or any of our other Tutorials, for \$4 including postage and handling, and six and over parts for \$8 (overseas postage additional). Please identify the Tutorial by its complete name, the issue it appeared in and the Part number (if applicable). All but the latest of our Tutorials are listed in YC's Annual Index, published with our July 1988 issue: refer to the Services page on how to obtain Back Issues.

– is much more readable than –

```
Strg[0]:=pred(Strg[0])
```

At least with the first line I can see straight away what it is I am trying to do. The biggest factor to me, though, is compatibility between versions of Turbo Pascal. I don't want to have to re-write all of my source code when changing versions.

Enough of this babble. The first thing I need to do with the string entered by the user is to convert it to uppercase, as this will make things easier when checking for valid filename characters later. The 'while' loop is started at the length of the string and works backwards. I could also have started at the beginning of the string and worked to the end but this would require the string length to be evaluated for every loop –

```
while Counter <= length(Strg) do...
```

```

const
  Star      = '*';
  Dot       = '.';
  Question  = '?';
  BSlash   = '\';
  Colon    = ':';
  EmptyStr  = '';
type
  Str10    = string[10];
  Str80    = string[80];
var
  Path, FName,
  FileName : Str80;
(-----)
procedure RemoveBadChars(var Strg : Str80);
var
  Len      : byte;
begin
  Len:=length(Strg);
  while Len > 0 do
  begin
    case Strg[Len] of
      Star,      { declaring these as constants makes }
      Dot,       { reading the source code easier than }
      Question, { trying to decipher '*','.', '?','\',':' }
      BSlash,
      Colon,
      'A'..'Z' : ; { all these are OK so do nothing }
      else      delete(Strg,Len,1);
    end; { of case Strg[Len] }
    Len:=Pred(Len);
  end;
end; { procedure RemoveBadChars(var Strg : Str80); }
(-----)
procedure MakeUpperCase(var Strg : Str80);
var
  Len      : byte;
begin
  Len:=length(Strg);
  while Len > 0 do
  begin
    case Strg[Len] of
      'a'..'z' : Strg[Len]:=uppercase(Strg[Len]);
    end; { of case Strg[Len] }
    Len:=pred(Len);
  end;
end; { procedure MakeUpperCase(var Strg : Str80); }
(-----)
procedure SetFName(var FName : Str80);
var
  DotPos      : byte;
  LeftSide    : string[81];
  RightSide   : string[31];
(-----)
function Expand(Strg : Str10; MaxLen : byte) : Str10;
var
  StarPos      : byte;

```

Each character is looked at in turn by the case statement and if it is lower case then it is converted, otherwise it is left alone. This is quicker than simply forcing all characters to uppercase regardless of what they were originally. Let's not waste time converting numbers and characters that don't need it –

```
for i:=1 to length(Strg) do Strg[i]:=uppercase(Strg[i]);
```

This routine could be doing many unnecessary conversions if the string contains numbers and other allowable characters which are not between 'A' and 'Z'.

Next we need to strip out any characters which are illegal in a path and filename. As noted in the source code, I declared the acceptable characters as constants which makes for a more readable list than trying to sort out the dot and dashes from the commas and single quotes that delimit them. Sure, this takes up a few extra bytes, but I consider it well worth the space for readability.

```

  StarPos:=0;
  StarPos:=pos(Star,Strg);
  case StarPos of
    0 : ; { No star present at all }
    1 : Strg:=EmptyStr; { only the star present }
    2..8 : Strg:=copy(Strg,1,pred(StarPos));
  end; { of case StarPos }
  if StarPos > 0 then
    Expand:=Strg+copy('??????',1,MaxLen-length(Strg)) else
    Expand:=Strg;
end; { function Expand(Strg : Str10) : Str10; }
begin { procedure SetFName }
  DotPos:=0;
  DotPos:=pos(Dot,FName);
  RightSide:=EmptyStr;
  if DotPos <> 0 then
  begin
    LeftSide:=copy(FName,1,pred(DotPos));
    RightSide:=copy(FName,succ(DotPos),3);
  end else LeftSide:=FName;
  FName:=Expand(LeftSide,8)+Dot+Expand(RightSide,3);
end; { procedure SetFName(var FName : Str80); }
(-----)
procedure Parse(FileName : Str80; var Path,FName : Str80);
var
  Len      : byte;
begin
  MakeUpperCase(FileName);
  RemoveBadChars(FileName);
  if pos(Colon,FileName) = 2 then { drive identifier supplied }
  begin
    Path:=copy(FileName,1,2);
    delete(FileName,1,2);
  end else Path:=EmptyStr;
  FName:=EmptyStr;
  Len:=length(FileName);
  while (Len > 0) and (FileName[Len] <> BSlash) do
  begin
    insert(FileName[Len],FName,1); { build filename backwards from }
    delete(FileName,Len,1); { the last char to the first as }
    Len:=pred(Len); { filename will be the last word }
  end; { in the string }
  if FName = EmptyStr then FName:=Star+Dot+Star;
  if pos(Star,FName) <> 0 then SetFName(FName);
  Path:=Path+FileName;
  if Path[length(Path)] = BSlash then delete(Path,length(Path),1);
end; { procedure Parse(FileName : Str80; var Path,FName : Str80); }
begin
  clrscr;
  write('Enter path and filename : ');
  readln(FileName);
  Parse(FileName,Path,FName);
  writeln('Path : ',Path);
  writeln('Filename : ',FName);
end.

```

Listing 1. A Turbo Pascal filename parsing routine that takes the user's input, including star dot star and question marks.

This parsing routine will be used many times over the years and should I need to modify it some time down the track, I don't want to sit and ponder unnecessarily.

For this routine I have left out the other characters that are legal in a filename, but to be correct they should also be added to the list of constants (refer to your DOS manual for valid characters - after all I had to leave you something to do).

The parsing routine

Now we get to the guts of the program, the parsing routine. First we check to see if a colon is present in the second position, and if so, we accept it and the drive letter preceding it. DOS will sort it out if it is a valid drive when it is called later. We can then check to determine the validity of the drive letter. After copying the drive designators (if any) to the string 'PATH', we can delete them from the passed string.

As mentioned earlier the filename will always be the last item in the passed string so by starting at the end and moving back to the beginning we can copy and delete each letter, thus building our file name from end to start until either the string is empty, or we encounter a backslash.

If there was no filename, then star dot star is added. The DOS command 'copy c:\dos b:' will copy the contents of the DOS directory on C: to drive B:. The way DOS actually sees the command is 'copy c:\dos????????? b:?????????' so we should allow for the operator to use such a command.

It is now time to check our new filename for the star character, and if found, expand the name up to the full length allowed and

pad with the question mark character. First the filename is broken down to its two parts, LEFTSIDE and RIGHTSIDE. You will notice the variable DOTPOS is first set to zero which may seem an unnecessary action, but my version of Turbo Pascal will not set DOTPOS to zero if a dot is not found when using the Turbo's 'pos()' function. Instead it will grab whatever value it finds where it sits in memory and use it (to be safe, I always first set the variable to zero).

The two sections of LEFTSIDE and RIGHTSIDE are padded with question marks according to the position of the star in each (if any). Finally the PATH is checked to see if a backslash is present at the end of the string and, if so, it is deleted. Some versions of DOS treat the following backslash as an invalid directory.

There you have it. A fairly painless method for parsing a command line in to its component parts. Being able to separate the Path from the filename allows for neat programming. You are able to save the current path, change to the new one, do your job and reset the original path, and all is back to where it should be.

Nothing annoys me more than calling a program, using it to do whatever, and then exit to find myself in the directory I had used within the program. I believe a program should return you to exactly where you were when you called it, and *not* dump you where it feels like it. Turbo Pascal is an offender here.

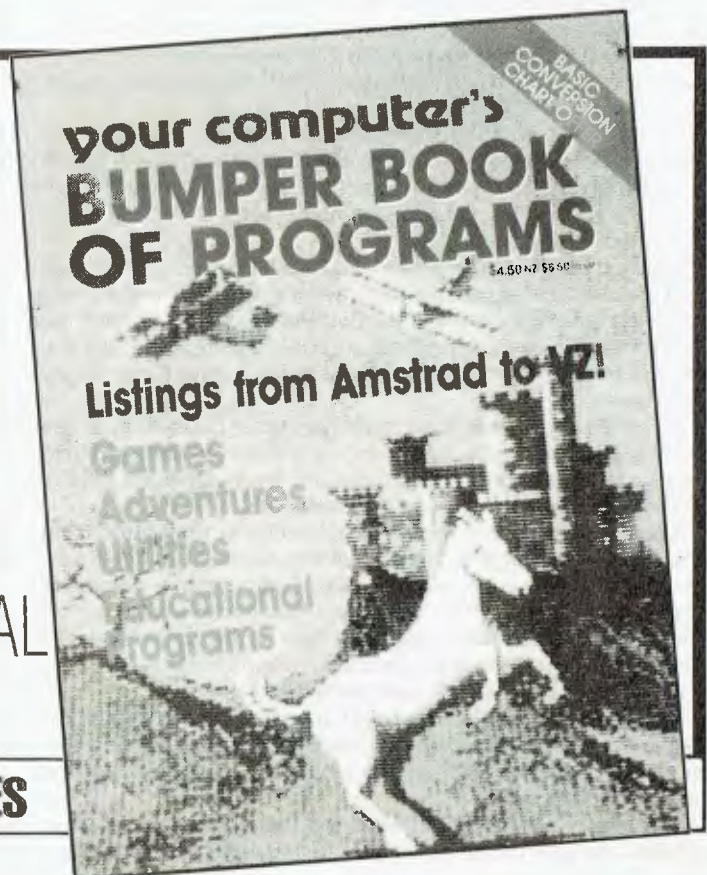
In a future article, I will show you how to make use of a filename with the question marks in it to perform wildcard searches and more. But for the time being you could try using the MSDOS directory display routine shown in the Turbo Tutor manual if you have it. □

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Behind HyperCard

Part 3

In Part 2, Stewart Fist covered System and Function Messages – since everything in HyperCard acts by sending and receiving messages, let's review and expand on what we've learned about them.

ALL ACTIONS in HyperCard are initiated by messages sent to objects. This is universally true if we include in our definition of objects, that quasi-object, the HyperCard program itself. Messages are generated by: system events (such as mouse clicks), menu selections, the execution of handlers in a script, statements typed into a message box, and the execution of commands at the program level.

These messages all flow through the HyperCard system in a pre-defined way. They enter the system at one of the lower levels – either the Button/Field level or the Card level – then flow on upwards through the object hierarchy (cards, backgrounds, stacks, home stack then HyperCard)

No matter at what level the message activates a handler, the original point of entry is known as the 'target', and this is stored and carried as a function through the system. This identification of the 'target' allows handlers at a higher level to determine the entry point of the message.

Which entry point a message uses (the target) depends on the kind of message it is. MouseEnter, mouseWithin and mouseLeave messages enter the system at the Button/Field level, but not if the cursor is within an unlocked field area (it is intercepted at the HyperCard level). Only if a field is locked, can it receive these mouse messages.

MouseDown and mouseUp messages enter the system at the Button/Field level, but not if the cursor is within an unlocked field area (it is intercepted at the HyperCard level). Only if a field is locked, can it receive these mouse messages.

A few specific system messages also enter at the Button/Field level: newButton, deleteButton, newField, deleteField, openField, closeField. Don't confuse these with commands: a command creates, say, a new button, then the newButton message is sent through this button (the target) and then further up through the hierarchy in case it needs to be used by some handler.

All other messages enter first at the Card level.

To direct the message to a target, a system-pointer within HyperCard keeps track of which card, background and stack is in use, and whether the cursor is within a button or field area on that card or background.

If areas overlap, HyperCard will select the topmost area (button or field), and give preference to background areas over card areas.

The 'topmost' area can be changed using the Objects menu's 'Bring Closer/Send Farther' selections, and you can swap buttons or fields from cards to backgrounds (or vice versa) by cutting and pasting.

When an object receives a message, it checks the message name against those of its handlers, and then passes it on; if it doesn't find a match, or if there is a 'pass' command within the handler. (Pass commands must be the last active line in a handler.) If it does find a match, the handler is executed.

Sending messages to objects

Messages can be sent directly to objects, subverting the normal hierarchy in only two ways. First, 'send' messages jump directly to the specified object. This can be any object in the current stack, any other stack (but not a specific card in another stack), or even HyperCard itself. When a message reaches the object to which it was directed, it is either executed by a handler, or passed up through this new hierarchy as if this were the entry point.

The other way is with 'go' messages, but they have a split personality. First of all, a 'go' message travels up the hierarchy of its target and, unless it is intercepted by some odd handler along the way, it will end up at the HyperCard level and possibly execute some change.

Despite the fact that we may now have swapped to another stack entirely (with another hierarchy), the remainder of messages in the original 'go' handler will then be transmitted up along the line of the old hierarchy as if the change hadn't happened.

Then – if handlers haven't been found to match these subsequent messages – the remaining messages from the originating handler will be re-transmitted up the new hierarchy from the new point of entry.

Remember that messages first cycle through their own script before traveling on up the object hierarchy. Even handlers in a script prior to the one issuing a message can intercept the message. (Sorry this is all so dry, but it is necessary to get the concepts of how messages are handled within HyperCard. This is the essence of the whole system.)

Messages can also have parameters. If I send the message 'go

next card', 'go' is the message name and 'next card' is the parameter. There can be two or more parameters separated by commas. For instance with the message –

```
searchScript "textField", "Help"
```

we can assume that further up the hierarchy there will be a handler something like this –

```
on searchScript pattern, stackName
  (remainder of handler will then use these variables
   pattern and 'stackName'.)
end searchScript
```

When the double-barrelled message reaches this handler, the word 'textField' will replace the variable 'pattern', and 'Help' will replace 'stackName'. The handler will (say) therefore initiate a search for the word 'textField' in the script attached to the Help stack.

Remember last month I made the distinction between system messages and function messages? HyperCard has a number of built-in functions which are used to calculate values, either derived from the conditions of the system itself (such as 'time'), or from parameters sent to it by the user.

System messages and function messages work exactly the same except for the syntax needed when passing parameters; everything we have said before about system messages applies equally to function messages.

If a message is intended to pass parameters to a function handler, the parameter should be enclosed between parentheses (). If there aren't any parameters to be passed, the empty pair of parentheses identifies the message name as applying to a function.

HyperCard's flexibility forces qualifications on the above

```
put time() into card field "Time"
```

is the strictly correct way to write the command line in a handler, using the parentheses to identify time as a function (which supplies its own parameters). HyperCard will also accept the word 'the' preceding the function-name as a function identifier –

```
put the time into card field "Time"
```

Length is a function used for measuring the number of characters in an alphanumeric string, so –

```
put length (lastName) into card field "nameLength"
```

The words 'the' and 'of' can be used to substitute for parentheses with a single parameter (but not for multiple parameters). Therefore –

```
put the length of lastName into card field "nameLength"
```

is acceptable.

The following example needs the parentheses (but not the words 'the' or 'of') –

```
put average (total_1, total_2) into card field "Results"
```

The variation –

```
put the average of total_1, total_2 into card field "Results"
```

wouldn't work. Notice the use of the underscore character here; it is the only non-alphabet or numerical character permissible in a variable name.

clickLoc

It's time to have a play again. This time we'll make a start on some simple functions just to examine how they work. We'll use a function called 'clickLoc' which returns the *x* and *y* co-ordinates of the cursor position on the screen at the time the last mouse-Down was issued (the last time you clicked).

First of all, create four small fields on a card in any of your play stacks. Call the fields 'position', 'horizontal', 'vertical' and 'average'. Now in the Card script write –

```
on idle
  put clickLoc() into card field "position"
end idle
```

Return to the operational mode and try clicking anywhere in the window. You should get the co-ordinates of the click at the time of mouseDown.

This gives you a hint as to an excellent way of replacing buttons, if you've got a large list (say an index), and you want a click on any entry to transport the user to a particular card. You can use clickLoc() to find the co-ordinates, then write a series of handlers that finds a match, and performs the jump.

Just for fun, remove the parentheses following clickLoc in the handler example and see what happens. Replace them again and add the line 'pass idle'

Now below this handler, write another –

```
on idle
  put first item of clickLoc() into card field "horizontal"
  put second item of clickLoc() into card field "vertical"
end idle
```

You can see that this is intended to divide up the co-ordinates of clickLoc and place them into individual card fields – but it won't work – not while the first handler is in place. It is worth playing around with swapping the order of these two handlers in the script to see what effect this has. Remember to put a 'pass

Hints, tips and ideas!

Got any hints tips or ideas you'd like to share with other HyperCard users? Or maybe you've written a great new program you'd like to tell others about, or discovered a new use for HyperCard?

Tell us about it (preferably on a 5¼ inch disk in ASCII format); forward to *Your Computer, PO Box 227, Waterloo 2015 NSW*. Please include a printout of the disk, an explanation of what the program does and caption any illustrations that may be included. Unfortunately, because of space limitations, we cannot publish listings over 200 lines long, but we can make them available to other users via our Bulletin Board or on request.

idle' line in the first handler to ensure that the idle message gets through to the second.

Using the handler (above), add another message line –

```
put average (horizontal, vertical) into card field "average"
```

Nothing happens again. We have fallen into the trap of confusing field names with variables. To make this line work we need to insert two new lines before it –

```
put first item of clickLoc() into horizontal
put second item of clickLoc() into vertical
```

Now we have established two variables, added parameters to them, then used the 'average' function to calculate a result which can then be entered into another card field.

This is one of the traps with a program that provides such flexibility in the use of words in the code, and which allows duplication of names between variables, buttons, fields, cards, whatever; you can confuse yourself very easily.

For this reason it is always best to standardise on using terminology like 'card field "xyz"' or 'background button "xyz"', even when the defining terms or the quotes aren't strictly necessary.

The above handler isn't necessarily a recommended way to go about finding a mouse location, nor can I think of any reason why we would average these two values. It is just a convenient function that returns a couple of parameters.

Mouse functions

HyperCard has many mouse functions. For instance, mouseH is a function that returns the horizontal position of the mouse and mouseV returns the vertical (which is a lot easier than the way we did it above). If you write an 'on idle' handler, these two functions can be used to constantly feed the co-ordinates into the two fields –

```
on idle
  put mouseH() into card field "horizontal"
  put mouseV() into card field "vertical"
end idle
```

or, if you wished, this could be a mouseUp handler which would only return the individual coordinates of the point on which you clicked.

The function mouseLoc is similar to clickLoc, except that it gives both co-ordinates of the current cursor position rather than the clicked position, and mouseClick returns a true or false string if the mouse has been clicked since the handler started executing.

This gives us a convenient little handler to use to introduce the use of 'if...then...else' in HyperCard handlers. Create a reasonably large card field and add this script –

```
on mouseEnter
  put "Click or don't click.."
  wait 5 seconds
  if mouseClick() then
    put "You clicked."
  else
    put "You didn't click."
  end if
end mouseEnter
```

What is interesting, is that if you don't specify where to put something HyperCard places it in a message box. The quotes around the literal are necessary to define it as a text string as distinct from a variable. Without the quotes HyperCard would be looking for a variable called 'click' and then try to make sense out of the rest.

Also fascinating is the simplicity of the English expression 'wait 5 seconds'; HyperCard will work just as well with 'wait five seconds', or 'wait five secs', or 'wait 5 secs' or even 'wait 5secs' (with a missing space). It is a most forgiving language – but don't forget essentials like the 'end if' line.

In HyperCard you refer to the 'on xyz/end xyz' and 'function xyz/end xyz' script elements collectively as handler structures, or, specifically as message structures and function structures, respectively.

'If...then...else/end if' and 'repeat/end repeat' elements within a script are known as control structures. Control structures are basically conditional – they let you specify sections of the handler that will only be executed when some condition has been met.

Both the 'If/the/else' and the 'Repeat' structures must reside between the two bookends of a message or function handler, and they are nestable themselves – which simply means that they can have secondary If/Repeat structures between their own 'book-ends'. So you can have a handler with repeats, within repeats, within repeats, and so on.

'If...then...else' structures can be one line only. In this case they don't need to be 'book-ended' with an 'end if' line. Thus you can have a conditional line within a handler like –

```
if numCount = 10 then beep else add 1 to numCount
```

However in many conditional statements there will be a number of command lines to be executed and so you will have to fall back on the classic multiple line structure –

```
if numCount = 10 then
  play "boing"
  (any other command lines)
else
  beep
  (any other command lines)
end if
```

and in this case you must terminate this unit of the handler with an 'end if'. If you are nesting, then there must be an 'end if' for each 'if...then...else' structure.

Repeat structures work much the same as the above, but there is no single-statement form. (Don't forget that these must be written between handlers!) The first line of a repeat structure must begin with the word 'repeat' and the last line must be 'end repeat'.

You can use as the statement any of these –

```
repeat
  repeat 5 times
  repeat until numCount contains 6
  repeat while numCount < 6
  repeat with decrement = 6 down to 1
  repeat with increment = 1 to 6
```

The first statement here will repeat forever, and therefore it needs

HYPERCARD

... it is necessary to get the concepts of how messages are handled within HyperCard. This is the essence of the whole system.

something within the structure which allows the program to exit. Something like –

```
add 1 to Message Box
if Message Box contains 6 then exit repeat
```

The first two, and the last two statement examples in this list are evaluated in terms of numbers (with forever being infinity) while the third and the fourth example here establish conditions which cause the repeat action to stop. Both 'repeat while' and 'repeat until' conditions are evaluated only in terms of 'are they true or false'.

The third allows the use of the equal sign (=) instead of the word 'contains' ('contains' compares the two as text strings, while = compares them as numbers). However the fourth example will not accept 'is less than' in place of the < sign – there's a limit to the variations possible!

In addition to the above, there is also a 'next repeat' statement which, when it is encountered within a repeat cycle, causes the structure to restart from the top immediately (it doesn't wait until the end of the handler).

The 'next' statement can appear anywhere within the repeat, and it can be conditional; therefore –

```
if Message Box contains 6 then next repeat
```

will force the seventh repeat cycle without executing statement lines further down the handler.

Control will flow between the first repeat line and the 'end repeat' until the conditions established are met, or until an 'exit' statement is encountered. In either case, control immediately passes to the next line in the handler following the 'end repeat'.

□

Some useful key messages to try

These messages are all sent to the current card whenever a particular key is pressed. In addition to these messages being sent through the system, they are also HyperTalk commands:

returnKey – sent whenever the Return key is pressed (except when you are adding text to a field);

enterKey – sent by Enter key (except when adding text to a field);

tabKey – sent by the Tab key (except when adding text to a field);

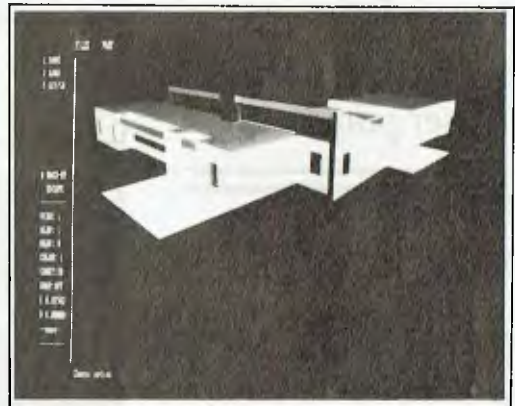
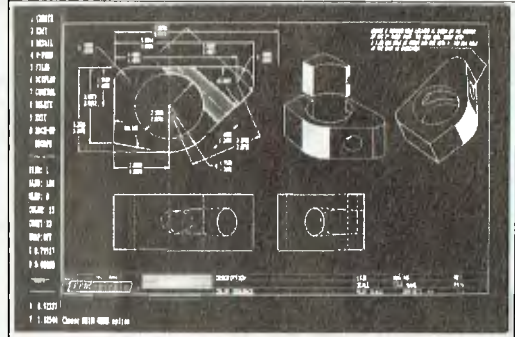
arrowKey left, right, up, down – sent by the appropriate keys; the directions are parameters;

functionKey X – the parameter X can range from 1 to 15, with Function keys 1 to 4 being preset as a default to the Undo, Cut, Copy and Paste commands;

controlKey X – the parameter X here can range from 0 to 255. These arise when the Control and another key are pressed simultaneously. Values between 1 and 31 are the standard ASCII values.

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Colour Graphics Screens on a Laser Printer

Jeff Richards shows that by using shades of grey and patterning, an EGA high-resolution colour screen can be printed on a laser printer.

CLOUR GRAPHICS on a laser printer? Colour laser printers may be just around the corner, but it will be a long time before most of us will be able to afford one, so in the meantime the question is – how can we dump colour images to printer and still retain the colour details of the image?

One answer is to convert different colours into different shades of grey. Laser printers operating in bit-image mode allow each dot to be specified as printing or non-printing. By adjusting the density of printing dots in a specific region, varying shades of grey can be produced.

However, there is a limit to the effectiveness of this approach. Most laser printers have a resolution somewhat less than the nominal capability of the laser driver. This is because each printed dot always spreads to some extent, and dots that are almost adjacent will interfere with each other slightly. This means that, while useful, the shades-of-grey approach is limited.

The other alternative is to convert different colours into different patterns. Horizontal, vertical, diagonal and mesh patterns can be used to provide distinctive representations of the different colours. The approach adopted here uses a mixture of grey scales and patterns, but the actual technique used can be varied to suit different printers and requirements.

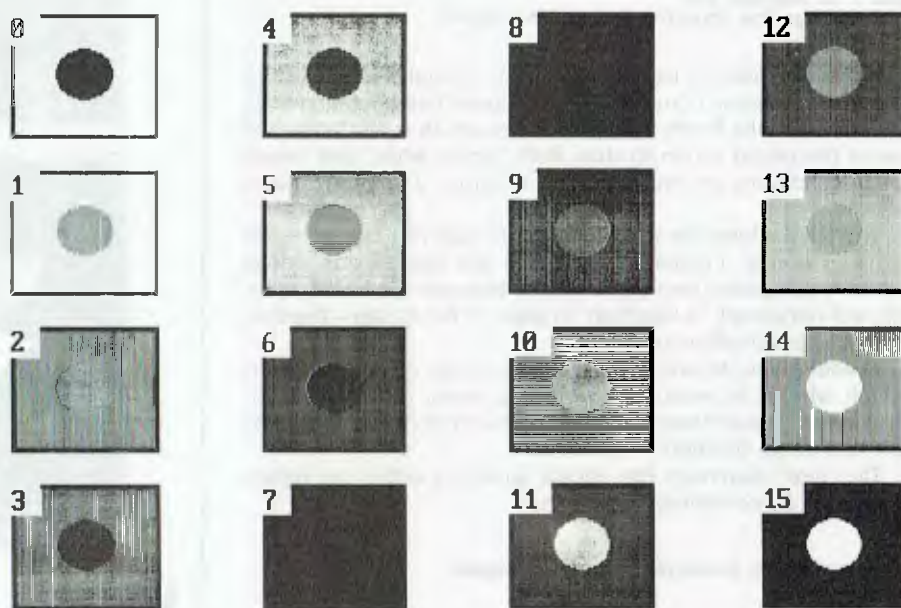


Figure 1. A colour graphics printing demonstration showing some of the combinations of different shades of grey that can be used.

Dot density

In the example patterns in Listing 1, shading is used up to a dot density of about 50 per cent; in other words, half the dots in a given region are black and the other half are white. At a 50 per cent shading level, the image is nearly black, so about half the theoretically possible shades are unusable.

The EGA High resolution screen is 640 by 350 pixels. The Epson laser printer used for this example prints at 300 dots per inch. If we transferred a monochrome image dot-for-dot we would end up with a printed image of a little over 2 inches by 1 inch – just right for a letterhead logo, but not quite adequate for the latest artistic creation. If the image is enlarged four times in both directions, it will be 8.5

inches by 4.6 inches – just about right. However, with only a little extra work we can enlarge it four times in the horizontal direction and five times in the vertical direction, giving an image of 8.5 inches by 6 inches with the correct aspect ratio.

Therefore, each screen pixel will become a 4 x 5 dot cell on the printed page. If we were transferring a monochrome image, this 4 x 5 region would be either black or white. If we want to transfer a colour image, then we can vary the density of dots and their arrangement within the pattern cell in order to produce the required shadings and patterns.

As mentioned above, densities of above about 10 dots per 4 x 5 region all appear black. To get 16 distinguishable regions we resort to using different patterns with a dot density of between 6 and 10.

With 16 different colours to represent, and five rows of pattern per colour, the patterns can be constructed as a 16x5 array of 4-bit integers – in other words, integers ranging from 0 to 15. There are other ways of representing such a set of patterns, but this is one most convenient for processing.

Deciding on the 4x5 representation has an additional benefit. Bit-image graphics data is sent to the printer in 8-bit words. By using a cell width of 4, we have significantly reduced the work needed to load the pattern information for each screen point into a word for transmission. Yet this assumes that the image is sent as a series of scans in the horizontal direction – like a TV picture is scanned. To orient the image correctly on the page the printer must be set to 'landscape' mode before starting the data transfer

The program

Having worked all that out, the program itself is quite simple. The screen image is scanned top to bottom, right to left. As each screen row is scanned, the colour of the pixel at the point is loaded into an array. When the row scan is finished, this row array is processed five times. For each point, the 4-bit pattern element corresponding to the colour of the pixel and the current pattern row is extracted from the pattern array. This is done two points at a time, with the first element inserted into the top half of the character, and the second element inserted into the lower half. Then the character can be sent to the printer.

Finally, a short note about constructing patterns. The point at which a pattern starts is not random – the screen pixel is being converted into a pattern cell that is large enough to represent an identifiable element in the final printout. Therefore, the placement of the pattern within the cell has a noticeable effect. For instance, if you build a pattern consisting of a single horizontal line, and insert it as the top line in a pattern cell, then the printed pattern will appear to be shifted slightly upwards – it will be hard against whatever colour is at its top edge, and there will be a gap at its lower edge. Such a pattern should be located in the centre of the cell.

The effect may be utilised to give a three dimensional appearance: several pattern combinations in the example program do just this. Usually, this effect would appear to be a misalignment of patterns, and should be avoided. □

```

DEFINT A-Z
DECLARE SUB sample ()
DEF FNAddr$(x) = CHR$(x MOD 256) + CHR$(x \ 256)

CONST w = 640, h = 350, px = 300, py = 200
DIM p(15, 4), s(639)

OPEN "lp1:" FOR OUTPUT AS #1
WIDTH #1, 255

SCREEN 9: CLS
CALL Sample

p(0, 0) = 0: p(0, 1) = 0: p(0, 2) = 0: p(0, 3) = 0: p(0, 4) = 0
p(1, 0) = 0: p(1, 1) = 2: p(1, 2) = 0: p(1, 3) = 2: p(1, 4) = 0
p(2, 0) = 2: p(2, 1) = 2: p(2, 2) = 2: p(2, 3) = 2: p(2, 4) = 2
p(3, 0) = 1: p(3, 1) = 9: p(3, 2) = 0: p(3, 3) = 1: p(3, 4) = 9
p(4, 0) = 8: p(4, 1) = 5: p(4, 2) = 0: p(4, 3) = 5: p(4, 4) = 0
p(5, 0) = 8: p(5, 1) = 5: p(5, 2) = 0: p(5, 3) = 5: p(5, 4) = 8
p(6, 0) = 10: p(6, 1) = 10: p(6, 2) = 2: p(6, 3) = 2: p(6, 4) = 2
p(7, 0) = 14: p(7, 1) = 10: p(7, 2) = 2: p(7, 3) = 2: p(7, 4) = 14
p(8, 0) = 5: p(8, 1) = 10: p(8, 2) = 5: p(8, 3) = 10: p(8, 4) = 5
p(9, 0) = 3: p(9, 1) = 3: p(9, 2) = 3: p(9, 3) = 3: p(9, 4) = 3
p(10, 0) = 15: p(10, 1) = 15: p(10, 2) = 0: p(10, 3) = 0: p(10, 4) = 0
p(11, 0) = 15: p(11, 1) = 15: p(11, 2) = 15: p(11, 3) = 0: p(11, 4) = 0
p(12, 0) = 15: p(12, 1) = 1: p(12, 2) = 1: p(12, 3) = 1: p(12, 4) = 1
p(13, 0) = 0: p(13, 1) = 6: p(13, 2) = 6: p(13, 3) = 6: p(13, 4) = 0
p(14, 0) = 1: p(14, 1) = 1: p(14, 2) = 1: p(14, 3) = 1: p(14, 4) = 1
p(15, 0) = 15: p(15, 1) = 15: p(15, 2) = 15: p(15, 3) = 15: p(15, 4) = 1

' Set printer up for bit image graphics
PRINT #1, CHR$(27); "v"; CHR$(0); CHR$(4);
' Send the number of bytes to expect
PRINT #1, CHR$(27); "y"; CHR$(7); CHR$(4);
PRINT #1, FNAddr$(w * 4); FNAddr$(h * 5);

' Send the data
FOR y = 0 TO h - 1
  FOR x = w - 1 TO 0 STEP -1
    s(x) = POINT(x, y)
    NEXT x
    FOR i = 0 TO 4
      FOR j = 0 TO w - 1 STEP 2
        B = p(s(j), i) * 16
        B = B OR p(s(j + 1), i)
        PRINT #1, CHR$(B);
      NEXT j
    NEXT i
  NEXT y

' Print at (px,py) with magnification = 1
PRINT #1, CHR$(27); "v"; CHR$(2); CHR$(4); CHR$(1); CHR$(1);
PRINT #1, FNAddr$(px); FNAddr$(py);
PRINT #1, CHR$(12);

SYSTEM

DEFINT A-Z
SUB Sample STATIC
LOCATE 1, 20: PRINT "Colour Graphics Printing Demonstration"
LOCATE 2, 20: PRINT "-----"
LINE (0, 0)-(639, 349), 15, B
FOR x = 56 TO 550 STEP 160
  FOR y = 56 TO 300 STEP 70
    LINE (x, y)-(x + 80, y + 55), 15, BF
    LINE (x + 2, y + 2)-(x + 78, y + 53), c, BF
    CIRCLE (x + 40, y + 27), 15, 15 - c
    PAINT (x + 40, y + 27), 15 - c
    LOCATE y / 14 + 1, x / 8: PRINT c,
    c = c + 1
  NEXT y
NEXT x
END SUB

```

Listing 1. The listing for a dump EGA screen mode 9 to an Epson GQ Laser Printer.

THE PROPHET

Now computers are wonderful devices, they can do all sorts of things for you. You can write and present professional style letters to your mother, you can make business presentations that can't be done on the boss's computer (remember those ads?) and you can send everyone you know Snoopy christmas cards and printout twelve-foot long Happy Birthday banners.

Computers have been hailed as the savior of man since the first Univac started blowing valves back in ancient times (like the 1950's). They have promised to do away with paper by storing information for us and they will save us from the drudgery of doing repetitive tasks. WALR – that is a technical term – What A Load of Rubbish!

'To make errors is only human, but a computer can really stuff it up!'

Every system that I have ever seen as being paper saving (meaning you don't need to scribble notes) is either so painful that it is thrown away or generates reports by the dozen (reports – you know PAPER). Oh sorry, there are the systems that are so friendly that you have to write notes to yourself to remind you what to put into the next screen that you have to fill in.

Most systems designed to reduce drudgery are actually only to reduce staff cost: I have seen various systems, that save the organisation involved a relatively lowly paid clerk ('hooray!' say management), but it adds the need for computer analysts, programmers and the computer equipment to run the system that was developed. Not to mention the managers to control all of this new fangled processing.

Then – you know what? – they have to hire a data input clerk to put the information into the computer!

Now it is not really quite that bad, the problem really is that the people developing all of these wonderful pieces of software really do not understand what it is they are trying to achieve. Computers are just overrated adding machines, sure they can do all sort of wonderful things for you, and yes, they are getting more and more powerful and versatile, *but*, they are still just stupid little boxes that do exactly what they are told.

Well what is the solution? Heck I don't know, I just wish that people would be more realistic when getting those adding machines to do things and realise that things will go wrong and when they do, the computer will really make a good job of it: 'To make errors is only human, but a computer can really stuff it up!'

Registry News

Rodney Creer has taken over as National PAMS Coordinator; the contact information remains the same, you can call my Bulletin Board (02) 628-5222 or send a message to him at 713/606.2. Now, maybe, you are wondering why I have 'resigned' as National Coordinator? Well, I have recently been appointed coordinator for FidoNet Zone 3, which is one of the three geographical areas in the world for FidoNet. I feel I should concentrate on that job and give it my best shot (just hope it isn't my foot!).

In the July issue I mentioned the case in the US of a user suing a System Operator for making public, private messages. This month

has been cute for another reason: my bulletin board, Prophet, uses a registration system that I obtained from the US. It has been used for over eighteen months now without a problem. Last week it totally failed – seems that Prophet has too many users for it to handle.

Rather than stop new users, I kept permitting access (without the automatic screening) and within a couple of days I have been attacked by a concerted effort of foul and abusive callers. It appears to be the effort of one or two people who are making life unpleasant for everyone. Noticing this, I managed to stop most of their messages from 'leaking' into the network, but one got through and was sent to every FidoNet board in Australia.

Apart from the fact that Prophet has always tried to be a place where everyone can have a chat (I have a lot of schools that use me to show how communications work), this all comes right when I am starting to take on board the duties of coordinating FidoNet. Damned embarrassing and annoying!

There is always the problem of these faceless people hiding behind a pseudonym – they are very hard to catch and it is even harder to do anything to them but revoke their access after catching them. Computer terrorism is going to be a big problem in the future.

Why do I call it terrorism? Because I believe it is. There is no real purpose behind it other than disrupting what should be a part of life that is enjoyable. Like piracy, which I call stealing, terrorism is one of the things that can destroy our hobby. I have no time for people who get their jollies from attacking other people from behind a mask of anonymity. □

Primary electronic collection points

The last full listing was given in the April 1988 issue; refer to the Services page on how to obtain Back issues.

ACT - PC Exchange RIBM
(062) 58 1406NSW - Prophet TBBS
(02) 628 5222

Vic. - Brainstorm Australia
(03) 758-7086

Qld. - AMPAK RCP/M
(07) 263-7070

SA - The Electronic Oracle
(08) 260-6222

WA - Nemo Multiple BBS RAPL
(09) 370-1855

NEW SOUTH WALES

*** NEW System ***

Albury & Wodonga Opus BBS

Sysop: Andre Dowling

Phone: (060) 25-2647

FIDOnet: 631/333

Baud: V21 V22 V22bis V23

Access: Reg LVA

Computer: IBM AT Clone

BBSSoftware: Opus

*** Amended ***

Amiga Zone BBS

Sysop: Richard Duffy

Phone: (02) 771-6351

Baud: V21 V22 V23 B103 B212

Access: Mem LVA

Computer: Amiga 1000

DOS: Amiga

BBSSoftware: BBS-PC!

*** NEW System ***

Flex or Die

Sysop: Joshua Levy

Phone: (02) 558-0129

Baud: V21 V22 V22bis V23

Access: Reg VA

Computer: IBM AT Clone

DOS: PC DOS

BBSSoftware: QuickBBS

*** NEW System ***

Home Base BBS

Sysop: Geoff Wrightson

PAMS News 8807

New system Sysops please note: If you do not receive your subscription within 3 months after publication here, please contact Allison Tait (02) 693-6620 at *Your Computer* – the subscription list is forwarded to Allison for processing each month.

Phone: (049) 53-2898
 Baud: V21 V22
 Access: Public
 Hours: Daily: 2030 - 0600
 Computer: IBM XT Clone
 DOS: MS DOS
 BBSSoftware: QuickBBS
 *** Amended ***
 Integra TEX
 Sysop: Kevin Leong
 Phone: (02) 746-1109
 FIDOnet: 712/703
 Baud: V21 V22 V22bis V23
 Access: Public
 Computer: IBM AT Clone
 DOS: PC DOS
 BBSSoftware: QuickBBS
 *** Online ***
 New Frontiers CBCS
 Sysop: Howard Pew
 Phone: (046) 25-6954
 Baud: V21 V22 V23 B103 B212
 Computer: IBM XT Clone
 DOS: PC DOS
 BBSSoftware: Opus
 *** Amended ***
 PC Users Group - IBM Board
 Sysop: John Clarke
 Phone: (02) 724-6813
 Baud: V21 V22 V22bis V23
 Access: Reg LVA
 Computer: IBM AT
 DOS: PC DOS
 BBSSoftware: Opus
 *** Amended ***
 PC Users Group - Microcomp Board
 Sysop: Bruce Edney
 Phone: (02) 540-1842
 FIDOnet: 712/505
 Baud: V21 V22 V22bis V23
 Access: Mem Reg VA
 Computer: IBM PC
 DOS: PC DOS
 BBSSoftware: Opus
 *** Amended ***
 Poet's Dilemma
 Sysop: John Della-Torre
 Phone: (02) 417-7182
 Baud: V21 V22 V22bis V23
 Access: Public
 Computer: IBM PC
 DOS: PC DOS
 BBSSoftware: GTPower
 *** Amended ***
 RUNX
 Sysop: Mark Webster
 Phone: (02) 487-2426
 Baud: V21 V22 V22bis V23
 Access: Mem LVA
 Computer: PDPI 1/73
 DOS: Xenix
 *** Amended ***
 Silent Running
 Sysop: DAZ
 Phone: (02) 59-1093
 Baud: V21 V22 V22bis V23
 Access: Reg
 Hours: Weekdays: 1430 - 0730

Weekends: 24 Hours
 Computer: Apple
 DOS: PRO DOS
 BBSSoftware: Prime
 *** NEW System ***
 Statesman
 Sysop: Michael Gayford
 Phone: (047) 33-1010
 Baud: V22 V22bis PEP
 Access: Reg
 Computer: IBM XT Clone
 DOS: PC DOS
 BBSSoftware: QuickBBS
 *** Online ***
 Tesseract RCPM+
 Sysop: Scott MacDonald
 Phone: (046) 55-2654
 Baud: V21 V22 V22bis V23
 Access: Mem VA
 Computer: Collex
 DOS: CP/M+
 BBSSoftware: RBBS
 *** Amended ***
 The Kiwi Konektion
 Sysop: Robert Earle
 Phone: (02) 439-6178
 FIDOnet: 711/410
 Baud: V21 V22 V22bis V23
 Access: Reg VA
 Computer: IBM XT
 DOS: PC DOS
 BBSSoftware: Opus
 *** Online ***
 Ventura Publisher BBS
 Phone: (02) 449-0463
 Baud: V21 V22
 Note: Xerox Ventura Publisher Support BBS
 *** Offline ***
 VIP BBS

QUEENSLAND

*** Amended ***
 Comtel BBS
 Sysop: Warren Mason
 Phone: (077) 89-1655
 Baud: V21 V22 V22bis V23 B103 B212
 Access: Mem VA
 Computer: Commodore 64
 DOS: Basic IEEE
 BBSSoftware: Comtel
 *** Amended ***
 Greenhorn Experimental
 Sysop: Mike Richardson
 Phone: (07) 208-2640
 FIDOnet: 640/301
 Baud: V21 V22 V22bis V23
 Access: Reg VA
 Computer: Cleaveland 286
 DOS: MS DOS
 BBSSoftware: Opus
 *** NEW System ***
 Herston Experimental BBS
 Sysop: Andrew Johnston
 Phone: (07) 253-7917

Baud: V22
 Access: Public
 Computer: Ultra Turbo XT
 DOS: MS DOS
 BBSSoftware: Opus
 *** NEW System ***
 *** Offline ***
 Midnight Express
 *** Amended ***
 Sunshine Coast Connection
 Sysop: Brian Boseley
 Phone: (071) 44-2889
 FIDOnet: 640/401
 Baud: V21 V22
 Access: Public
 Hours: Mon - Sat: 2000 - 0800
 Sun: 24 Hours
 Computer: IBM XT
 DOS: MS DOS
 BBSSoftware: Opus
 *** NEW System ***
 Swiss Pavilion BBS
 Sysop: Peter Moll
 Phone: (07) 846-4069
 Baud: V21 V22
 Access: Public
 Computer: IBM Model 50
 DOS: PC DOS
 BBSSoftware: Opus
 *** Amended ***
 TurboLink Australia
 Sysop: Viv Brunner
 Phone: (07) 262-1414
 Baud: V21 V22 V22bis V23 B103 B212
 Computer: IBM XT Clone
 DOS: MS DOS
 BBSSoftware: Opus

SOUTH AUSTRALIA

*** Amended ***
 ADelaide AMiga user group (ADAM)
 Sysop: Greg Hicks
 Phone: (08) 270-2455
 Baud: V21 V22 V22bis V23
 Access: Reg LVA
 Computer: IBM AT
 DOS: MS DOS
 BBSSoftware: PC Board
 *** Amended ***
 Buming Bush
 Sysop: Douglas Carthew
 Phone: (08) 272-8405
 FIDOnet: 680/811
 Baud: V21 V22 V22bis V23
 Access: Public
 Computer: IBM XT Clone
 DOS: MS DOS
 BBSSoftware: Opus
 *** NEW System ***
 MICRO SHACK
 Sysop: Geoff Hurst
 Phone: (08) 231-9550
 FIDOnet: 680/812
 Baud: V21 V22 V22bis V23
 Access: Public
 Computer: IBM AT Clone

DOS: MS DOS
 BBSSoftware: Opus
 *** NEW System ***
 Opus Party
 Sysop: Bruce Kelly
 Phone: (08) 384-7621
 FIDOnet: 680/816
 Baud: V21 V22 V22bis
 Access: Reg LVA
 Hours: Mon - Sat: 24 Hours
 Computer: IBM XT Clone
 DOS: PC DOS
 BBSSoftware: Opus
 *** Amended ***
 Phone Box BBS
 Sysop: Darryl Merritt
 Phone: (08) 380-5505
 FIDOnet: 681/854
 Baud: V21 V22 V23
 Access: Public
 Computer: Mitec
 DOS: MS DOS
 BBSSoftware: Opus
 *** Amended ***
 SA Country CBCS
 Sysop: Martin Crockett
 Phone: (085) 22-4434
 FIDOnet: 681/853
 Baud: V21 V22 V22bis V23
 Access: Public
 Computer: IBM XT Clone
 DOS: PC DOS
 BBSSoftware: Opus
 *** Amended ***
 The IDN Board
 Sysop: Dave Winfield
 Phone: (08) 352-2252
 FIDOnet: 681/852
 Baud: V21 V22 V22bis
 Access: Reg LVA
 Computer: IBM Clone
 BBSSoftware: Opus
 *** NEW System ***
 The Key Board
 Sysop: Paul Lawrence
 Phone: (08) 344-5354
 FIDOnet: 680/814
 Baud: V21 V22 V22bis V23
 Access: Public
 Computer: IBM Clone
 DOS: MS DOS
 BBSSoftware: Opus
 *** NEW System ***
 VK5UP BBS
 Sysop: Dave Winfield
 Phone: (08) 281-4160
 FIDOnet: 681/851
 Baud: V22
 Access: Reg LVA
 Computer: IBM Clone
 BBSSoftware: Opus
 VICTORIA
 *** Amended ***
 ABE
 Sysop: Paul O'Connor
 Phone: (03) 288-3599

Baud: V21 V22 V23
 Access: Public
 *** Amended ***
 Alloy Opus BBS
 Sysop: Robert Nagy
 Phone: (03) 560-3902
 Baud: V21 V22 V22bis
 BBSSoftware: Opus
 *** Offline ***
 Apple Hackers BBS
 *** Name Changed ***
 Arts Computer Supplies
 Note: Now Called Darkside BBS
 *** Amended ***
 Bayside
 Sysop: Paddy Plebanowicz
 Phone: (052) 53-1110
 FIDOnet: 630/313
 Baud: V21 V22 V22bis V23
 Access: Reg Public
 Computer: IBM Clone
 BBSSoftware: Opus
 *** Amended ***
 Crystal Symphony Opus
 Sysop: Greg Jones
 Phone: (03) 874-4176
 FIDOnet: 632/346
 Baud: V21 V22 V22bis V23 B103
 B212
 Access: Mem VA
 Hours: Daily: 2200 - 0700
 Computer: IBM XT Clone

DOS: PC DOS
 BBSSoftware: Opus
 *** Amended ***
 Darkside BBS
 Sysop: Tal Silberman
 Phone: (03) 525-9015
 Baud: V21 V22
 Access: Public
 DOS: PC DOS
 BBSSoftware: Opus
 *** NEW System ***
 Discovery M.P.BB.
 Sysop: David Bowman, Hal 9000 & Marvin
 Phone: (059) 75-9058
 Baud: V21 V22 V23
 Access: Reg VA
 Hours: Weekdays: 2100 - 0700
 Weekends: 24 Hours
 Computer: IBM XT Clone
 DOS: PC DOS
 BBSSoftware: Opus
 *** NEW System ***
 JIMCON BBS
 Sysop: Iim Connelly
 Phone: (03) 762-9843
 Baud: V21 V22 V22bis
 Access: Reg
 Hours: Daily: 1400 - 0315
 Computer: Commodore PC20
 DOS: MS DOS
 BBSSoftware: Opus

*** Amended ***
 Mercury BBS
 Sysop: John Fisher & John Swanland
 Phone: (03) 887-1475
 Baud: V21
 *** Amended ***
 Miki's Opus CBCS
 Sysop: Miklos Bolvary & Emil Zudic
 Phone: (03) 887-1756
 Baud: V22 V22bis B103 B212
 Hours: Daily: 2100 - 0900
 Computer: ELT 286 Baby AT
 DOS: PC DOS
 BBSSoftware: Opus
 *** Amended ***
 Pacific Island
 Sysop: Craig Bowen
 Phone: (03) 890-2174
 Baud: V21 V22 V22bis
 Computer: Apple
 BBSSoftware: GBBS
 *** NEW System ***
 SMART BBS
 Sysop: Richard Hoskin
 Phone: (03) 602-1336
 Baud: V21 V22 V22bis V23
 Access: Mem VA
 Computer: Skai 386
 DOS: PC DOS
 BBSSoftware: Opus
 *** Amended ***

The Australian Pub with NO Beer
 Sysop: Grahame Mitchell
 Phone: (03) 736-1814
 FIDOnet: 632/350
 Baud: V21 V22 V22bis
 Access: Mem VA
 Computer: Amstrad 1512
 BBSSoftware: Opus
 *** Offline ***
 VIDEOTEXT/4000

WESTERN AUSTRALIA

*** Amended ***
 Terminal BBS
 Sysop: Andrew Milner
 Phone: (09) 389-8048
 Baud: V21 V22 B103 B212
 Access: Public
 *** Amended ***
 The Codiac Republic BBS
 Sysop: Simon Shaw
 Phone: (09) 481-4715
 FIDOnet: 692/623
 Baud: V21 V22 V22bis V23
 Access: Reg
 Hours: Weekdays: 1700 - 0800
 Weekends: 24 Hours
 Computer: IBM AT
 BBSSoftware: Opus



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NEW PRODUCTS

Software

AdvancePrint

Hewlett-Packard
Phone: (03) 895 2895
Price: Not supplied

Hewlett-Packard has released AdvancePrint, a software program that offers shared printing and plotting for PCs connected to an H-P 3000 business computer through serial connections. It is a cost effective alternate to a LAN based solution for H-P Vectra PCs, H-P 150 PCs and IBM XT, ATs and PS/2s.

PC users can print to shared plotters and printers with the same level of functionality that they would have if these devices were connected directly to their PCs. Easy to understand menu options help decrease installation and configuration time.

Autosolid

Autodesk Australia
Phone: (03) 429 9888
Price: Under \$10,000

Autodesk Australia has released AutoSolid, a solid modeling package. It provides complete mechanical computer aided engineering (Mcae) functionality. AutoSolid uses both constructive solid geometry and boundary representation modeling techniques.

The package derives its accuracy from PADL-2, the University of Rochester's Part and Assembly description Language. However, the PADL-2 has been rewritten in C, making it an efficient and portable system. This analytical representation provides the information required for downstream applications.

CCS Designer

Electronic Solutions
Phone: (02) 427 4422
Price: \$299 taxed

Electronic Solutions has released a Cad package from US company, Complete Computer Services Incorporated. CCS Designer runs all IBM PC models and compatibles with at least 512 Kbyte RAM. It can be set up

to run on most graphics cards, including the Hercules mono, CGA, EGA and VGA. It also supports a wide range of mice, digitising tablets, printers and plotters. A mouse is not needed to run the program, although one is more convenient.

CCS Designer can draw 'rubber band' lines and boxes; zoom up and down over a number of magnifications; rotate a drawing through any desired angle; allow section move and copying; and automatically dimension and scale a drawing.

Easy Working

Dick Smith Electronics
Phone: (02) 888 3200
Price: From \$24.95

The Easy Working series from Spinnaker covers just about all average user software applications with seven titles. All can be fully integrated with one another. The Writer is a complete word processing package which includes all the usual processing features plus spelling check, search and find, block insertions, header and footnotes. The Planner is a spreadsheet program for the production of tax records, budgeting, expense reports and so on. The Graph Maker allows the user to create graphs and pie charts in up to six different styles. The Connector is a communications program, while The Filer is ideal for mailing lists, inventories, club memberships and so on. Other programs in this series are also available.

Mac WordPerfect

WordPerfect
Phone: (02) 498 7155
Price: \$660 taxed

The Macintosh version of WordPerfect offers file compatibility with several WordPerfect hardware environments such as the IBM PC and compatibles, Data General, Digital VAX, Apple IIGS, IIe and IIc, NEC APC III, Digital Rainbow, Atari and Amiga. Other features include on-screen graphics and font changes, kerning, PostScript support and a graphics page preview feature.

WordPerfect also provides ex-

tensive file management capabilities, allowing the user to copy, delete, look at or retrieve a file from a list onscreen. All features can be accessed using either the keyboard or mouse. WordPerfect for the Macintosh also includes a 115,000 word expandable speller, a thesaurus, footnote and endnote capabilities and auto outline/paragraph numbering.

Lotus

Lotus Agenda

Lotus
Phone: (02) 287 1900
Price: Not supplied

Lotus has announced shipment of Lotus Agenda. It is a personal information manager designed to help PC users collect, organise, analyse and act on textual data, including phone messages, business cards and lists of tasks.

Agenda has three main components: Items, Categories and Views. Through Items, data is entered in a natural, unstructured sequence. Categories allows you to structure an Item and Views allows the user to look at the information from different perspectives in multiple, flexible views.

Agenda's Item/Category approach allows you to capture 'loose' information. Lotus Agenda is aimed at PC users who manage projects and people, need to keep track of many things and who view information as a source.



Micro Pay Version 2.3

Micro Pay
Phone: (02) 411 8363
Price: Not supplied

Micro Pay has upgraded its payroll processing software to Version 2.3. The latest version of Micro Pay includes a back pay transaction variant, added to transaction entry, allowing for the automatic calculation of back pay and tax.

It can automatically calculate the value of termination pay and tax for components on leave entitlement. Employees can select up to three different Electronic Funds Transfer institutions in which to have their pay allocated. An employee history report, which is password protected and selectable on employee, data ranges and history type, is also available. Two additional non-contributory supercategories have been added to the Employee Master File.

Payroll update

Business and Agricultural Systems Services
Phone: (07) 229 7712
Price: See below

BASS has announced an interim release (2.80) of the Payroll package, primarily to cater for new Taxation Department requirements for Group Certificates. If you require an upgrade, return your original Compact Payroll disk, with a cheque for \$58 if you are currently using release 2.50. Those users requiring an update for Release 2.1 or earlier should pay \$118. A major upgrade of the Payroll package is under development and will be released in late '88.

Magnum, Magnetic and Maggie

Compumod
Phone: (02) 232 1677
Price: Not supplied

Magnum, Magnetic and Maggie are electromagnetic analysis programs enabling engineers and analysts to determine information critical to product performance, prior to production. Solutions are available for the following types of problems: magnetostatic, magnetodynamic, electrostatic, electrodynamic, thermal, electromagnetic and transient. Result parameters in the form of graphic and numeric output are available.

Magnum is a 3D finite element analysis program. Magnetic is capable of handling planar and axisymmetric problems of unlimited size, while Maggie is designed to perform finite element

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analysis on the IBM XT, AT, PS/2 or compatibles for problems in a planar or axisymmetric geometry.



IMAGINEERING™

MacDraw II

Imagineering

Phone: (02) 697 8666

Price: See below

MacDraw II adds speed, flexibility, precision and colour capabilities to the original MacDraw package. The new version was designed to meet the needs of business professionals, graphic artists, desktop publishers, engineers and architects. MacDraw II will be priced at \$745. Current MacDraw owners can upgrade to a MacDraw II for \$240.

Printix 3.0

The Computer Factory

Phone: (02) 938 2522

Price: \$445 taxed

Printix 3.0 is a page formatting program that reads a textfile created by a word processor and outputs desktop publishing quality print to a variety of dot matrix and laser printers.

You create a textfile with your word processor and save it to disk; then run Printix and your document will be formatted with full control of the page layout. Features include a range of text formatting features such as proportional spacing, microjustification, margins, tabs, headers, footers and page numbering. Graphics can be inserted into the text and Printix will automatically flow the text around the graphic.

Other features include line drawing, mail merge, font control and selection and page preview.



peopleBase

High Caliber Systems

Phone: (02) 953 9205

Price: \$395 taxed

Using peopleBase any business can manage mailing lists, print form letters and/or labels or envelopes for selected groups of people, print custom labels and analyse numeric information. Using simple pull down menus, you can select a person from a list of people to be contacted and review their correspondence and general history.

The program is an integrated system that combines database management, word processing, mail merge, appointment scheduling, phone dialing and analytical reporting capabilities. It requires 640 Kbyte of RAM and a hard disk; it is for the MS-DOS operating system. Data is stored in dBase III 'dbf' format.

Reference File

Logo Computer Centre

Phone: (02) 819 6811

Price: Not supplied

Reference File is a high powered pop-up database. It runs as a background pop-up with most popular software, including word processors, spreadsheets and conventional databases. Typical uses include as a financial databases for Lotus users, mailing list databases for use in word processing and reminder database.

Reference File can import dBase 1-2-3, ASCII, PFS, SDF DIF and other common file formats. The number of databases allowed is unlimited, while the number of records per database is 30 million with 64 fields per record.

SCO Xenix 286 and 386

MPA

Phone: (03) 894 1500

Price: Not supplied

MPA has announced that the IBM PS/2 Models 50, 60 and 80 are supported in Release 2.2 of

SCO Xenix 286 and SCO Xenix 386. All of the commonly available hardware for the IBM PS/2 is supported. This includes the 3 1/2 inch disk in both 720 Kbyte and 1.44 Mbyte formats, the VGA video adapter with all the monitor options, the internal modem, all of the disk options (auto configuring to the ST506 or ESDI controllers and the disk size), the standard printer adapter, and the IBM serial devices.

LOGISOFT™
AUSTRALIA

Wendin-DOS

Logisoft Australia

Phone: (07) 870 7105

Price: See below

Logisoft Australia is now shipping the latest version of Wendin-DOS from Wendin Incorporated, US. It is a multiuser, multi-tasking DOS alternative. Release 2.14 now includes support for RLL controller cards, European keyboards, country-dependent information and offers more extensive device drivers, including support for the Logitech Mouse.

Wendin-DOS allows 'well behaved' DOS programs, which use only documented DOS features, to run as multiple tasks under a VAX/VMS-like operating environment. Version 2.14 does not support terminate-stay-resident programs such as SideKick. Wendin-DOS is priced at \$295 or bundled with the Application Developer's kit for \$490. All prices taxed.

WKS Library

The Computer Factory

Phone: (02) 938 2522

Price: \$495 taxed

WKS is a powerful programmer's tool that gives C and Basic programmers direct access to worksheets and database files. It can be used to exchange data between any programs using WKS, WK1, DBF or ASCII file formats.

Popular programs which use these file formats include Lotus 1-2-3, dBase III, Excel, Symphony, VP-Planner, SuperCalc4, Quattro and Clipper. In addition, the new version, 2.0, can be accessed through programs written in Microsoft's QuickBasic 4.



Music Publisher

Graphics Notes

Phone: (008) 88 2042

Price: \$985

Music Publisher Version 1.0 allows music to be typeset on a PC, then printed by laser printer to professional publishing standards. It enables composers, arrangers, copyists, musicians and others in the music or film indus-

tries to produce commercial quality notation of music - from a single melody line to a full orchestral score.

Music Publisher runs on all Apple Macintosh, MacPlus, SE and Macintosh II computers. Music Publisher 1.0 comprises the software, Presto keypad, Repertoire Music font, transparent stickers for Mac keyboards and a user manual.

IBM PC/XT/AT BOARDS

8087	8087-2 (8MHz) Co-roc	195.00
ES1004A	Floppy Disc Card, 4 ports	65.00
ES1005	Multi I/O card	175.00
ES1009	Parallel Printer Card	44.00
ES1010	Serial RS-232C card	55.00
ES1010B	Serial RS232C card, 2 ports	79.00
ES1014	I/O Plus II Card	136.00
ES1015	Universal RAM Card, 640K RAM	550.00
ES1015A	Universal RAM Card, 512K RAM	525.00
ES10232A	Colour Graphic/Printer Card	155.00
ES1600E	10MHz XT Motherboard OK*	299.00
ES1611	Serial/Parallel - Keystate	137.00
ES1623	Turbo Colour Graphics Card	165.00
ES1629C	PEGA w/Hurcules Mode	299.00
ES1633	Turbo Mono Graphics Card	165.00
ES1638	Facsimile Card	1249.00
ES2000XT	2MB EMS memory board, OK RAM*	249.00
ES2210	Serial/Parallel AGC	137.00
ES2210A	Serial/Parallel WYSE	137.00
ES256K12	256K RAM Chip, 120nS	23.00
ES256K15	256K RAM Chip, 150nS	19.90
ES350	Turbo/Mono Printer Card	175.00
ES488	IEEE 488 Interface Card	465.00
ES6210	Hard Disk Controller Card-XT	199.00
ES650	Colour Graphics/Mono card	195.00
ESCABLE2M	Cable, IBM Printer, 2M	12.00
ESCABLE3M	Cable, IBM Printer, 3M	15.00
ESCASEXT	Case - XT, hinged	95.00
ESCONV	AD/DA Converter, 1 channel	215.00
ESCONV2	AD/DA dual channel card	599.00
ESEPROM	EPROM writer card	195.00
ESEXTRACHIP	2nd for RS232 board	25.00
ESKEYBOARD	Keyboard, 84 keys XT/AT	125.00
ESKEYBOARD	Keyboard, 101 keys XT/AT	145.00
ESP9150S	150W Switching PSU XT	148.00
ESP9180	180W Switching PSU baby AT	170.00
ESP9180L	180W PSU, Baby AT, L Type	170.00
ESPEED286	80286 speed-up card	595.00
ESV20	V20 Chip	29.00
ESV30	10MHz V30 chip	49.00
H452	Co-processor, 80287-6	450.00
H452B	Co-processor, 80287-8	663.00

IBM AT BOARDS

ES1220	1.2M/720K/360K/1.44M Floppy card	145.00
ES2000AT	2MB EMS Memory board, OK RAM*	249.00
ES2200	FDD/HDD Controller card	493.00
ES2230AT	I/O Plus Card for PC/AT	245.00
ES2230ATB	Multi I/O, 4s, 1P, 1G	399.00
ES2350	3.5MB Multifunc card, OK RAM*	495.00
ES2401A	10MHz Baby AT Motherb'd, OK*	795.00
ES2403	DTC 5280 FDD/HDD Controller	295.00
ESCASEAT	Case AT - hinged	155.00
ESCASEBABYAT	Case - Baby AT style	135.00
ESP9200	220W Switching PSU - AT	220.00

PRINTERS

P2200	NEC P2200 Printer	695.00
P22CF	Cut sheet feeder	155.00
RP22	Ribbon, P2200	16.00

PERIPHERALS

ESDRIVE1200	NEC 1.2MB Disc drive	285.00
ESDRIVE360	360K drive, Japanese Mfg	245.00
ESDRIV35	3.5" floppy drive, 720K	255.00
ESHARD10	NEC 10MHz hard disc	395.00
ESHARD20	NEC 20MHz hard disc	549.00
ESHARD40	NEC 40MHz hard disc	995.00
ESM5400	14" EGA Colour monitor	845.00
ESMICROCASE	5.25" case for 3.5" drive	30.00
ESMONITORAMB	Monitor, TTL amber	210.00
ESMONITORGRN	Monitor, TTL green	199.00
MULTISYNC2	NEC Multisync II monitor	1249.00

CONSUMABLES

MD1	Diskette, 5S SD - (Apple)	25.00
MD2D	Diskette, DS DD - (IBM)	25.00
MD2F	Diskette, DS QD - (NEC)	35.00
MD2HD	Diskette, DS QD - (1.2MB)	49.00

CAD PRODUCTS

CCSDSIGN	CCS Designer & DEXXA Mouse	299.00
CCS SYMBOL	Symbol Libraries	79.00
LOGI	Logi Paint Show	75.00
DR-2A	Designer DR-2A Mouse	99.00

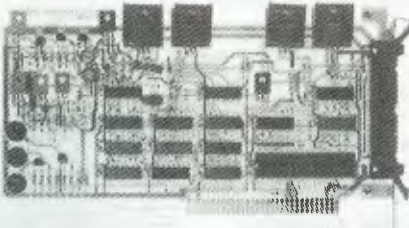
* OK RAM MEANS ZERO RAM FITTED



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EPROM Programmer Card

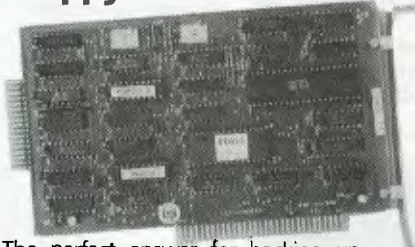


This superb EPROM burner comes with a high quality ZIF socket and cabling, with facility to add 3 more sockets if necessary. Facilities include the ability to read, write, copy, compare and erase the contents of EPROMs. It can also verify data and even combine the data in two smaller EPROMs into a larger one.

Compatible EPROMS include: 2716, 2732, 2764, 27128, 27256, 27512, 2804, 2816, 2864, 58064. It comes complete with software and user manual.

CAT. ESEEPROM **\$195**

1.2M/360K/720K/1.44M Floppy Controller



The perfect answer for backing up hard disks, archiving etc.

- Supports 1.2M, 720K, 1.44M and 360K 5¼" and 3½" drives
- Fully PC/XT, PC/AT compatible
- For suitable drive see below

CAT. ES1220 **\$145**

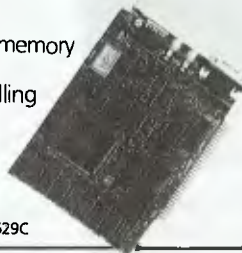
PEGA EGA card - unmatched resolution

Get all the standards with this superb short slot EGA card.

- Supports Monochrome, Hercules, CGA, EGA and Plantronics modes. Fully Auto switchable.
- Supports 132 columns in Symphony, Lotus and WordPerfect
- Automatic monitor detection
- 256K of video memory standard
- Flicker free scrolling

~~\$495~~
\$299.00

CAT. ES1629C



Disk Drives

40 Track - Japanese manufacture.
Very fast track-to-track. 360K DSDD.
Lowest price in Australia

CAT. ESDRIVE360 **\$245**

20MB NEC Hard Disk. Very fast and super reliable. Best price in town.

CAT. ESHARD20 **\$549**

Complete with controller

CAT. ES6210 **\$699**

Floppy Disk Controller



- Controls up to 4 DS/DD 360K drives

CAT. ES1004A **\$65**

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Build a PC or AT with one of our sturdy, all steel cases.

XT Style Case with Hinged Lid **\$95.00**

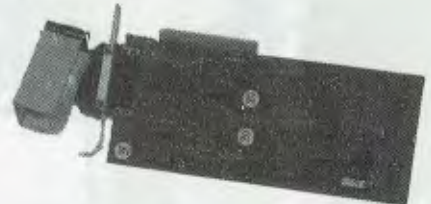
CAT. ESCASEXT

AT Case - compact size **\$135.00**

CAT. ESCASEBABYAT

AD-DA Conversion Cards

Interface your PC to the real world!!



Single channel ADDA

- 12 bit precision
- Input/Output voltage 0-9V (adjustable)
- Unipolar or bipolar
- Settling time 500nS
- Nonlinearity 0.2%
- Conversion time 60uS

CAT. ESCONV **\$215.00**

Dual Channel High-Res card

- 14 bit resolution
- 16 input channels
- Unipolar or bipolar input and output levels
- Conversion time less than 42uS

CAT. ESCONV2 **\$599.00**

1.2M NEC. Super high density. Superb construction and reliability. Works with 1.2MB floppy controller.

SPECIAL OFFER

At Last! A High Quality Mouse you can afford!



Electronic Solutions have tracked down a very high performance, industry standard mouse. At \$99, it costs around one third the price of lower performance rodents. The mouse is a convenient serial type and comes with software to test, set up and operate.

A major improvement over other mice with the Electronic Solutions mouse is higher resolution and higher tracking speed – up to 600mm/sec.

Features which set it above other mice include:

- Extra high resolution: 290 DPI and up
- Selectable baud rate: 1200, 2400, 4800, 9600
- Optimum mechanism: Ball on centre
- Super tracking speed: 600mm/sec and up.

The ES Mouse is compatible with application software supporting Microsoft and Mouse Systems mice. This includes AutoCAD, ClickArt, Desqview, Dr. Halo, GEM, Microsoft Windows,

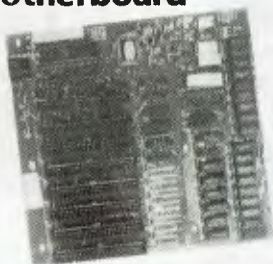
Microsoft Word, Norton Utilities, PageMaker, PC Paintbrush, Personal Editor, Smartwork, TopView, Ventura Publisher and many thousands more.

The mouse includes its own pocket and pad. Introductory price is only

\$99.00 inc. tax

9 pin to 25 pin adaptor, suit AT computers only \$10.00

Give your computer a new motherboard



The best and most cost affective way of upgrading your computer system is by replacing the motherboard on your PC with something faster. You'll get the latest technology without having to sell the computer you've got. Most of the value of your PC is in the hardware – the power supply, case, disk drives etc.

All come with 640K RAM fitted.

Motherboard	Speed	Price
XT (10MHz no-wait state OK RAM)*	x3	\$299
CAT ES1600E		
AT Turbo (12MHz no wait-state OK RAM)*	x13	\$699
CAT ES2401A		
386 (16MHz no wait-state 2MB RAM) CAT ES80386	x24	\$3500
386 (20MHz no wait-state 2MB RAM) CAT ES8038620	x32	\$3995

Parallel Printer Card

■ Standard TTL level ■ Centronics printer port, full IBM, EPSON compatible

CAT. ES1009 **\$44**

*OK RAM MEANS NO RAM CHIPS FITTED

Power for those upgrades

If you start adding to your PC, you should consider upgrading your power supply. We have a complete range, for both XT and AT models, suitable for both standard size and "baby AT" cases. All include interference suppression and connectors. Our prices are around half that of the opposition. Buy from Electronic solutions and save!!



150W, suit XT CAT ESP-9150	\$148.00
180W, suit XT, CAT ESP-9180	\$170.00
180W, suit AT, baby AT case	
CAT ESP-9180L	\$170.00
220W, suit AT, full size	
AT case CAT ESP-220	\$220.00

Multi I/O Card

■ Floppy disk adaptor, 2 drives DS/DD
 ■ 1 serial port, 1 parallel port,
 1 joystick port ■ Clock/calendar
 with battery backup

CAT ES1005 **\$175**



I/O Master – the ultimate communications board

A complete set of fully configurable ports for you IBM PC XT/AT.

- 4 serial ports – full configurable
- 1 parallel port
- 1 games port

\$399

CAT ES2230ATB



Complete with all connectors.

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Note: Products may vary in appearance from those pictured. In all cases they will perform to the same, or better standard.

- All products carry a 14 day money back guarantee
- All products carry a full 3 months warranty
- All cards come with full documentation
- Ring for quantity discounts and tax free prices.
- Freight \$7.50 for first item, then \$2.50 for each extra item.

New Machines

Dart range

Computer Networks

Phone: (02) 427 1722

Price: See below

The Dart range consists of the Dart 88-10, Dart 286-10, the Dart 286-16 and the Dart 386-20. The range of workstations work can be used on all major vendors' LANs, including 3Com, DEC-Net, Sun PC-NFS and IBM Token Ring Networks.

The Dart 88-10, priced at \$2395, has 640 Kbyte of RAM and runs at 10 MHz. The Dart 286-10, priced at \$3595, has 1 Mbyte of RAM as standard, upgradeable to 8 Mbyte on the mother board and runs at 10 MHz. The Dart 286-16 is priced at \$3995 and has 1 Mbyte as standard, upgradeable to 8 Mbyte on the motherboard, and runs at 16 MHz. The Dart 386-29 is priced at \$6695, has 1 Mbyte of RAM as standard, upgradeable to 8 Mbytes on the motherboard and runs at 20 MHz. All Dart workstations are available as diskless or with one or two floppy disk drives.



TOSHIBA

T1200FB and HB

Toshiba

Phone: (022) 887 3322

Price: See below

Toshiba has announced two new backlit supertwisted liquid crystal display laptop models for its highly successful battery powered T1200 computer family.

The T1200FB is a floppy disk drive backlit, while the T1200HB is a hard disk backlit model. The new models include either an internal 20 Mbyte hard disk and 720 Kbyte 3 1/2 inch disk single drive or dual disk drive version. They operate on an 80C86 processor at 9.54 or 4.77 MHz and hold 1 Mbyte of RAM.

Both models offer seven built-in interfaces and can run up to three hours on batteries. They include an 80C87 co-processor socket. Optional extras available for the new laptops are a 17 key numeric keypad, external 5.25 inch 360 Kbyte disk drive and vehicle cigarette lighter adapter.

Hitachi Australia Ltd.
REPRESENTATIVE

HL320

Hitachi

Phone: (02) 929 8799

Price: See below

The HL320 laptop is a successor to the HL300. Two models are available; a 20 Mbyte hard disk version and twin disk model. It features an 11 inch diagonal backlit LCD and a detachable keyboard. The hard disk model costs \$3295 while the twin disk version costs \$2295.

Peripherals

286 Express accelerator cards

Tandy

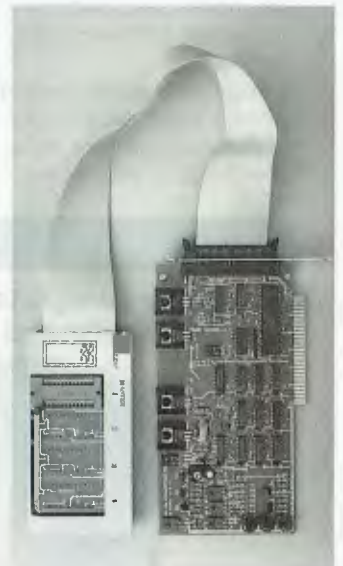
Phone: (02) 675 1222

Price: \$799.95

Tandy has announced the release of the 286 Express accelerator cards for the Tandy 100 SX and Tandy 1000 PCs. The 286 Express increases the performance of the 8088-based 1000 SX and 1000 from 200 to 600 per cent, according to Tandy. With the 286

Express, users will be able to increase productivity by running spreadsheet, word processing, desktop publishing and other applications two to three times faster.

The 286 Express is a half slot, 80286 accelerator card running at 7.2 MHz. The card features 8 Kbytes of cache memory, an optional 80287 math co-processor and full direct memory access (DMA) compatibility.



ES Burner

Electronic Solutions

Phone: (02) 427 4422

Price: Not supplied

ES Burner is an EPROM Burner with 'drop down' menu software. It is suitable for burning most popular EPROMs and comes with a high quality ZIF socket and cabling, with facility to add three more sockets if necessary. Facilities include the ability to read, write, copy, compare and erase the contents of EPROMs. It can also verify data and even combine the data in two smaller EPROMs into a larger one.

The ES Burner also has the ability to read data into the PCs memory buffer; check an EPROM to see whether it is blank or not; programming and erasing; load an object data file into computer memory and save memory buffer on disk; combine two EPROMs into one device; read data from EPROMs to memory and save to disk.

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GREAT BARRIER REEF • AUSTRALIA

THE BEST RESORT IN THE WORLD



THE BEST ACTIVITIES

Ride a jet-ski. Hire a catamaran, dinghy, surf ski, canoe or power boat. Water-ski, fish, snorkel or scuba dive. Sailboard, parasail or bushwalk. Try tennis, squash, aerobics or the gym. Or just lie on the beach and soak up the sun.

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There are individual "Polynesian-style" Bures, spacious hotel rooms and luxury, self-contained suites with up to three bedrooms. All have king or queen size beds, ceiling fans and spacious balconies and the views are spectacular.



THE BEST FAMILY FACILITIES

As well as their own supervised Kids Club (for those under 12), the children will love meeting the kangaroos, emus, koalas, wallabies, deer and birdlife in our mountain-top Fauna Park. And that's on top of all the other island activities.

For reservations see your Travel Agent or Ansett Airlines. For further information call 02-327-1899 or mail this coupon to FREEPOST 14, Hamilton Island Marketing, Suite 609, Eastpoint, 180 Ocean Street, Edgecliff NSW 2027.

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Currently prices for a week on Hamilton Island are:

SYDNEY	\$879*	CAIRNS	\$699*
MELBOURNE	\$949*	CANBERRA	\$899*
BRISBANE	\$799*	PERTH	\$1249*
ADELAIDE	\$999*	HOBART	\$1069*

*All prices include return economy airfare and share twin Allamanda or Bure accommodation. Similar savings are available in Bougainvillea hotel rooms and one and two bedroom apartments. These prices are available April 30 to September 18, 1988.

Electronics Today

INTERNATIONAL

**Free HI-FI
magazine inside**



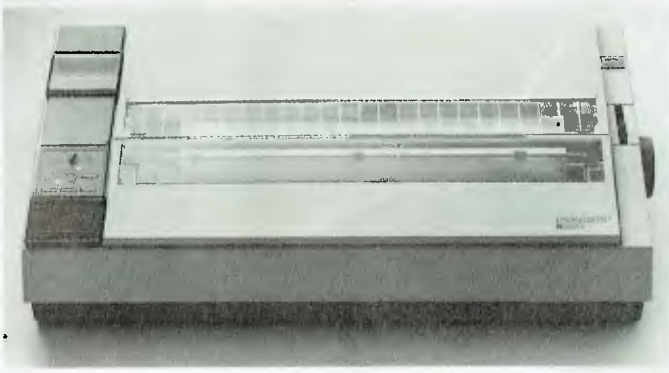
Australia's most respected electronics magazine now includes Sound Insights, a monthly digest of news, views and reviews on audio equipment. If you take your listening pleasure seriously, then Sound Insights is a must.



Electronics Today International is the pre-eminent magazine for the electronic lifestyle. We follow the latest developments around the world, in computers, in the physical sciences, in audio engineering, in communications, and space technology. For the practical fanatic, we have a great selection of do-it-yourself projects every month. Read ETI for the best writing in any electronics magazine.

Available monthly at your newsagent or subscribe now by phoning (02) 693-9517 or 693-9515

NEW PRODUCTS



B3450

Elmeasco
Phone: (02) 736 2888
Price: Not supplied

The B3450 dot matrix printer from Facit offers word processing users a high resolution colour graphics capability for the production of graphs, charts and so on. Graphics resolution ranges from 60 to 360 dots per inch horizontally and 1/180 inch minimum vertically.

In addition to the colour graphics capability, the B3450 offers users a host of features. The 24-pin printhead produces a letter quality output at 80 characters per second (cps) while speed in draft mode is 250 cps. The B3450 can also use font cards. In letter quality, users may choose 10 pitch, 12 pitch or proportional spacing. In draft mode, spacing choices are expanded to include 15 characters per inch (cpi) and 17 cpi. A number of paper handling options are featured.

JetMemory

Interface Technology
Phone: (02) 809 6144
Price: Not supplied

JetMemory is a new line of low cost memory enhancement products for users of Hewlett-Packard LaserJet II printers. The memory expansion boards are fully upgradable and expandable; they are constructed with surface mount technology components.

Memory expansion modules are designed to dock with the available JetMemory I megabyte starter memory, which brings the LaserJet to a 1.5 Mbyte capacity. Users can add an additional 1 Mbyte or 3 Mbyte module without discarding the original add-on board.

△ External floppy drive adapter cable

Samways Electronics
Phone: (048) 851 541
Price: Not supplied

The external floppy drive adapter cable provides an external floppy disk drive connector for your IBM PC, XT or AT. The external connector is compatible with the IBM PC external drive connector. It allows a single external device to be connected to the host computer.

The primary reason for providing an external floppy disk drive connector is to enable fast convenient data transfer to and from laptop computers (provided the laptop has its drives controlled by a host computer). The external floppy drive adapter cable replaces the existing drive controller cable.

CAPcard

Software Product Support
Phone: (02) 419 5366
Price: Not supplied

SPS has announced the release of the CAPcard computer aided printer interface card. It is primarily designed for users of Ventura Publisher and PageMaker.

CAPcard is able to print a full page of text and graphics with Ventura Publisher at 300 dots per inch (dpi) in 20 seconds. It is also compatible with the full range of bitstream scalable font outline, and gives instant access to any of these fonts or outlines, as well as being to make use of special scientific characters. The CAPcard can change fonts in one second, using its own onboard 2 Mbyte of memory and CPU. CAPcard is compatible with the IBM PC, XT, AT, 386 and supports Canon based laser printers.

Miscellaneous



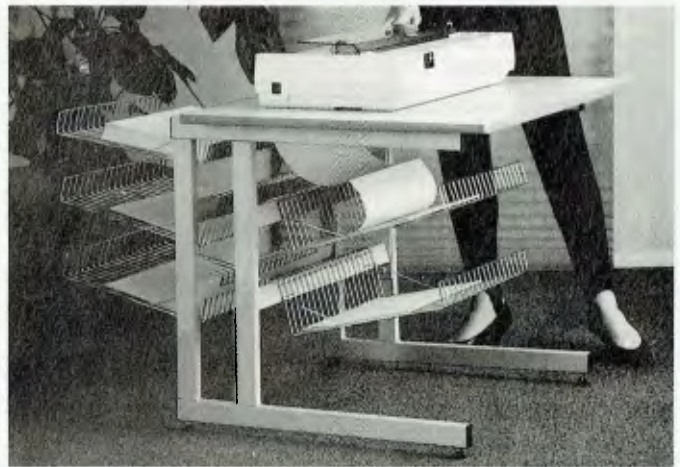
Computer tape storage △

Wormald Security
Phone: (02) 320 5678
Price: Not supplied

Wormald Security has announced a new computer media storage vault in Melbourne. The vault, which is capable of holding up to 200,000 cartridges of computer tape, has been constructed to protect its precious contents from any unwanted attention. The facility is buried beneath Wormald's headquarters in

North Melbourne.

The tapes are protected by Halon gas fire protection which extinguishes fires by consuming all available oxygen; dustproofing all entrances and double air locks; waterproofing; temperature and humidity control and fully independent power supply. Security features include closed circuit TV monitoring; both entrances air locked, situated within a recognised security area and access to storage vault only by authorised personnel.



Multistat

Sylex
Phone: (02) 647 2888
Price: \$495 taxed

Sylex has released the Multistat printer and paper holder. Up to

△

four types of stationary can be held at the ready in generous paper baskets while the top basket is reserved to collect your printout. Ideal for printers which are used by different departments.



QuickC slashes pizza market in half.

You know what it's like. The "El Supremo" pizza you ordered to keep you company while programming into the wee small hours, tastes like cold cheese flavoured cardboard.

If only your programming could be as fast as the food.

Change the menu

Time to switch to Microsoft QuickC. The fully integrated Compiler/Editor/Debugger. Whether it's your first taste of C, or you're an old hand, all your programming tools are within reach instantly. See what you're doing as you do it.

If you can pull down a menu you can pull off stunning code at 10,000 lines per minute. And should you be so unlucky, it will point out your mistakes 26 at a time. Then when they're fixed, QuickC's automatic MAKE files ensure recompiles are the fastest in their class. You can't go wrong.

Help that's always ready and willing

The ubiquitous undo command and context sensitive help, make sure that even within the most powerful C environment you're never alone. Help is always at hand.

QuickC is one of the leading languages for the MS DOS operating system. It's a perfect stepping stone to Microsoft C 5.1, which uses the latest optimising technology for MS DOS and OS/2. Backed by immediate on-line support and expansive handbooks. Now the only thing left to cut back on, is the late night pizza.

Phone our Sydney hotline on 452 0222 or toll-free (008) 226 850. Or clip the coupon to find out how the best selling C programming tool makes the most demanding tasks a snack. All for \$135.00 (ex tax).



Microsoft® QuickC

The best routine you'll ever get into.

HEY! count me in. I need QuickC please send more information.

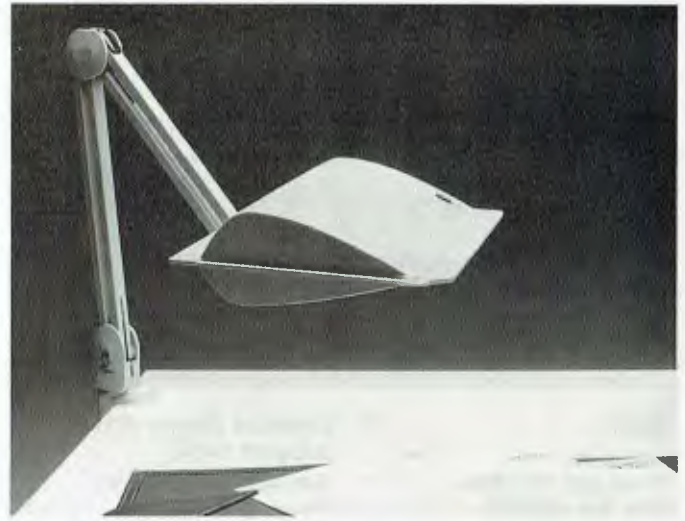
Mr/Mrs/Ms/Miss _____
 Title _____ Organisation _____
 Address _____
 Postcode: _____ State _____
 Telephone (W) _____ (H) _____

Can I have some information on the other Microsoft languages: YC

C 5.1 Pascal 4 Fortran 4.1 MASM BASIC 6 QuickBASIC

Send to: Microsoft Pty Ltd, PO Box 95, Forestville NSW 2087

ATA MICKSKY 288 YC



PL410/A

Sylex

Phone: (02) 647 2888

Price: Not supplied

Standard office lighting often proves unsuitable for EDP operators; glare and reflection being a major problem. As a solution to the problem, Sylex has introduced the PL410/A desk lamp.

It is specifically designed for use with data terminals where good light quality and glare

avoidance from glass VDU sources is essential. The PL410/A is an ideal light for workstations in open office environments which may be shaded by partitioning because the asymmetric lamp head throws a soft wash of natural light over the keyboard and work surface but shades the screen from annoying reflections. The articulated, internally spring balanced arm lets you position the lamp head right where you need it.

Events

A series of seminars will be conducted by Management Technology Education. Seminars include Successful User Documentation (to be held in Sydney, Melbourne, Adelaide and Perth), OS/2, PC/MS-DOS and Supporting PCs (Sydney and Melbourne). For further information contact: (02) 262 5555, (03) 670 7117 or (008) 22 4514.

ACC '88, the annual conference for the ACS will be held at Darling Harbour, 21 to 23 September. Contact Karen Hucks (02) 211 5855.

Microbits 88 is an introductory course on interfacing principles for IBM and compatible machines. The course is either part time (6 weeks duration, 1 night a week from 14 September) or full time (5 days) from 5 December. For further information contact the Queensland Institute of Technology, Physics department on (07) 223 2196.

MTE is holding a two day seminar on desktop connectivity; Sydney - 1 to 2 September, Melbourne - 8 to 9 September. A seminar on manufacturing resource planning is also to be held; Sydney - 8 to 9 September, Melbourne - 5 to 6 September. Contact: (02) 261 5555 or (088) 22 4514.

The Australian Robot Association will be holding an international symposium and exposition on robots at the Sydney Hilton and Centrepoint from the 6 to 10 September. Contact the association at GPO Box 1527, Sydney NSW 2001.

Data General will hold an informal conference on AOSVS at Regent Hotel, Melbourne from 19 to 21 September. Contact Tim McQueen on (03) 698 6988.

James White will be presenting a three day on the X.400 and X.500 recommendations for message handling; Perth - 13 to 15 September; Melbourne - 19 to 21 September; Sydney - 26 to 28 September. Contact: (02) 665 8294.

CMGA annual conference to held at the Sydney Hilton 13 to 15 September. Contact: (02) 260 9444.

ACC '88, the annual conference of the ACS, will be held at Darling Harbour, in conjunction with the Australian Computer Exhibition, from 21 to 21 September. Contact Karen Hicks on (02) 211 5855.

TADSEM '88, the sixth national seminar hosted by Technical Aid to the Disabled, will be held at the Queen Elizabeth II Rehabilitation Centre, Camperdown on the 7 and 8 October. The topic for this year's seminar is Computers Serving People with Disabilities. Contact (02) 808 2022.

Beyond 2000 Science and Technology Spectrum is a multimedia multi dimensional 'experience' held in conjunction with the *Beyond 2000* TV technology show. Five interconnecting pavilions will present working displays of life in the future including lifestyle, medical (featuring a replica of a human heart), industrial, science and electronics. Contact Spectrum Exhibitions on (02) 281 2555.

SUGA '88, the SAS Users' Group of Australia annual conference will be held 12 to 14 October at Darling Harbour. Contact the coordinator on (02) 908 2244.

Infotex '88 is a computer and communications show especially for government. It will be held from November 8 to 10 at the National Exhibition Centre, Canberra. Contact (02) 959 5555.

SST-88, the second Australian International Conference on Speech Science and Technology, will be held at Macquarie University, Sydney, on November 29 and December 1. Contact the Secretariat at Macquarie University on (02) 805 8784.

Microbee Users Group of WA.- New members please note that the group meets at the Leeder-ville Technical College. For further information contact the secretary, Ross Gould on (09) 417 1374 after hours; or write to PO Box N1090, Perth 2000.

The Australian Paradox Users Group (APUG) has been formed. Regular monthly meetings will be held on the last Tuesday of each month at Bird Cameron, 316 Queen St, Melbourne 3000 Victoria. For further information contact Gordon Cas-

tle on (03) 563 1037. Or write to APUG PO Box 26, Chadstone Centre 3148 Victoria.

CLUES, the C Language Users and Enthusiasts Society, is now holding regular meetings at Microsoft, 1/17 Rodborough Road, Frenchs Forest on the first Tuesday of every month.

Special Interest Groups for PC Users: CONSIG meets on the first Wednesday of each month in Sydney; contact (02) 290 2655. The DTP Graphics SIG meets on the first Tuesday of the month in Sydney; contact Mark Richards on (02) 929 5855. PCWEST meets on the first Monday of the month in Sydney; phone Bill McEwen (02) 627 2488.

The President Users Group meets on the last Tuesday of each month at the Hornsby Inn. Contact Raymond Toms on (02) 212 5277.

Watercomp '89, the first Australasian conference on Technical Computing in the Water Industry organisers are asking for papers. The conference will be held from May 30 to June 1, 1989 at the Regent Hotel, Melbourne. Contact the Institute of Engineers, Australia on (062) 70 6549.

Ireecon '89 will be held at the Exhibition Building, Melbourne from September 12 to 15, 1989. Contact: (02) 327 4822.

Computer '89 will be held at the Perth Entertainment Centre from 27 to 29 April. Contact Swan Exhibitions on (09) 443 3400.

ASWEC '89, the Australian Software Engineering Conference, has announced a call for papers. Theme is Facing up to software. Contact (062) 70 6549.

SST-88, the second Australian International Conference on Speech Science and Technology, will be held at the Macquarie University from November 29 to December 1. Contact: (02) 805 8784.

Overseas Exhibitions

Internecon/Semiconductor Asia/Pacific, will be held from 14 to 17 September at the World Trade Centre in Singapore. Contact Ann Theseria or Kareen Chang, Cahners, Singapore 271 1013. □

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C:\	FILE: *.*		
GALLERY	DISK: C:		
SCANGAL	Available		
SER_DEMO	Bytes: 8,052,736		
TBASIC	DISK Statistics		
TEMP	Total		
TMAST	Files:	846	
UTIL	Bytes:	12,283,042	
XTRPRO	Matching		
WORD	Files:	846	
WS2000	Bytes:	12,283,042	
WYSE	Tagged		
	Files:	0	
	Bytes:	0	
INSTALL .COM	XTRPRO .X01	XTRPRO .X30	Current Directory
README .DOC	XTRPRO .X02	XTRPRO .X40	Bytes: 220,004
SNAPSHOT.COM	XTRPRO .X10	XTRPRO .X50	
XTRPRO .COM	XTRPRO .X20	XTRPROCFG.EXE	

XTreePro (Lm) Version 1.0 Serial # 105274

Every car has a basic tool kit. Sure, it may be little more than a jack and a wheel brace to change a flat tyre, but it is there, and it is essential. If there is major trouble, either the driver will have to fix it, with more tools, or call a mechanic with the knowledge and the tools for the job.

The hard disk on your computer is an area where trouble can strike, and a tool kit is need for running repairs. No, not a big hammer, and then a bigger hammer if the first can't hit hard enough, because I am not talking about physical or electronic repairs, but in salvaging software and files, and rearranging the disk.

Fixit disks

I keep a disk close and handy, with programs that form my essential tool kit. Well, it was a single disk, but it has grown to a couple of 360 kilobyte 5¼ inch floppies as my tool kit programs have grown in numbers and sizes. In addition, I keep a 720 Kbyte 3½ inch floppy with the same files. Between them, they cater for almost any PC that I come across. I don't carry 1.44 megabyte 3½ inch disks or 1.2 Mbyte 5¼ inch disks as the smaller capacity disks can be read in any machine, including ATs, that I come across. I call my disks the Fixit disks. In one very compact package they allow me to do almost hard disk fix that software alone can handle.

I can unerase files, sort directories, optimise the file arrangements on the disk, copy files, rearrange the directory tree, rename directories, rename disks and edit files in ASCII or HEX. Most important, I can test hard disks for bad tracks, mark

them off, do low level hard disk formatting, hard disk partitioning and DOS formatting. Most often, the problems I need to fix have nothing to do with a flaky drive, but are some sort of fix-up for the files.

What do I have on the disks? A plethora of tools. First and foremost, the disks were initially formatted as system disks, and having DOS on them means that I can boot a system even if the hard disk won't. I have carefully made sure that all my machines run the same version of DOS. If I have to deal with a machine originally running another version in an emergency PC DOS 3.3 will usually get it going.

The tools start with the DOS programs DEBUG, FDISK and FORMAT. These are the bare minimum required to get most hard disks up and running when first installed. Next follows XTree or XTree Pro. XTree takes less disk space, XTree Pro adds speed and worthwhile features. A subset of the Norton Utilities is essential. These include the main Norton Utilities program NU, plus the disk test program DT, the directory sorting program DS and the disk optimiser SD. I also carry that powerful and compact programmer's editor, the Norton Editor. WHIZ, a user supported program I reviewed recently in IBM Underground, allows me to find files on any drive attached to a PC.

Finally, I carry the Advanced Hard Disk Diagnostics from Kolod Research, on which are found HTEST to test hard disks for bad tracks, HFORMAT to carry out low level format, and HOPTIMUM to determine the optimum interleave for a hard disk.

XTree and XTree Pro

Many times a day I reach for XTree Pro. I have long given up use of DOS to copy, rename delete and otherwise manipulate files, because I don't like doing a DIR, followed by a blind command. XTree and XTree Pro allow me to see the tree like the directory structure on my hard disk. I can then look at either a listing of files in one directory, or all files on a disk, and mark some or all for action. They can then be deleted, copied, moved to other directories, renamed and so on. A very nice touch is that, optionally, the user can be prompted if moving or copying files will overwrite a file.

In addition, either program can rename sub-directories and can change the volume label on disks. Hidden files, normally invisible in a DIR, can be seen. In the directory, each file has 'attributes' which can mark it as hidden, system, read only and/or archive. Both programs can change any of these attributes on one file or groups of files. Both programs can also run selected programs without having to exit to DOS – something I find very useful when running benchmarks and test programs on review PCs. Xtree Pro is faster than XTree, can log up to eight drives in memory at a time, and can edit files, while XTree can only log one file and can browse files but not edit them. One or the other is essential if I am to retain what is left of my sanity.

Norton Utilities

The main Norton Utilities program NU has many functions, but I need two more than the rest. First is unerasing files. When a file is erased the data is not wiped off the disk. Merely, the first letter of the file name is changed, and all the sectors it occupies on the disk are marked as being available again. By replacing that leading letter of the file name, and following a chain of clusters through a disk, the file can usually be recovered. Essential for anyone, even though it can be difficult to recover program files if several have been deleted. In addition, it is often impossible to recover files if any file has been saved to disk since the erasure, as the sectors of the old file may have been overwritten by the new file and the information lost.

NU also allows me to browse through a file, see its contents in ASCII or HEX and change individual bytes. This alone can

allow me to find and remove a spurious end-of-file-marker part way through a text file which makes it impossible for, say, WordStar to read past it. It also allows me to look for hidden messages, or modify text strings in .EXE or .COM files, or in other ways make subtle changes to files. I have also used it to confirm that a suspect program is really a renamed pirate copy of commercial, and copyright, software by doing a byte-for-byte comparison of files from the original and the copy.

Disk Test allows me to test read a floppy or hard disk. It reports any suspect clusters found. Usually, it then can move data from suspect areas to safe areas. Always the bad clusters can be marked so that they won't be used again.

Directory Sort reads the file directories and subdirectories on a disk, sorts them into order by file name, extension, date, time and/or size. It then rewrites the directory information to the disk. A DIR will now be in sorted order. Big deal, I hear you say, but sorting the directory sort does give real performance gains. A subdirectory may be scattered over many clusters of a disk, and each cluster may have many empty entries scattered through it where files have been erased.

Now search for file after file, as the bulletin board program OPUS does when looking for messages, each of which is in its own file. The search is for messages in numerical order, and their directory entries might be anywhere in any cluster used by the directory. An amazing amount of time is taken as the hard disk heads jump all over the place, as OPUS scans message after message. DS makes sure that all the active directory entries are in sequence, and that there are no vacant entries scattered amongst the active ones. Just using DS to sort a directory can give significant hard disk performance improvements in many applications.

Sort Disk goes beyond Directory Sort. As files are created and modified on a disk, the data in individual files in a directory will be in many places on the disk. Even worse, any file too big to fit in a single cluster, as most will be, will be in clusters scattered all over the disk. Subdirectories will be remote from the parent directories. Relocation of the files on a hard disk can give useful performance gains. Sort Disk (SD) moves all the clusters containing directory information to the beginning of the disk. It unfragments each file, and makes sure that all files in each directory are next to each other in the same part of the disk. It also places files in child directories next to files in the parent directory.

Norton Editor

No programmer's tool kit is complete without a word processor or programmer's editor to create or modify programs or batch files. The Norton Editor is my favourite programmer's editor. It is very small, very fast, can handle two files at a time and has effectively no limit on file size. In general, if there is room on a floppy for the file and its backup, the Norton Editor can handle it. It even allows word wrap and margins, and can be used for a brief note if required, even though it is not a word processor. Because it writes ASCII files, and has optional word wrap, it can be used to reformat text files which have a carriage return/line feed at the end of each line. Other users have other favourites, and one or the other is absolutely essential, but the Norton Editor made it onto my Fixit disks on performance and its tiny file size.

Hard disk basics

When a disk comes from the factory, either a hard disk or a floppy, it must be formatted before it can be used. With a floppy, the DOS format program marks out the disk in one relatively quick process. Hard disks require a more complex process. First, a low level (sometimes called a controller level) format routine writes track and sector identification marks to the disk. Then the disk is partitioned, to allocate various areas as different DOS logical drives or for different operating systems. Finally, the DOS FORMAT program reads and writes a partition, builds a File Allocation Table, and places the DOS boot-up files on the disk.

Commonly, a hard disk controller has a low level formatting program in ROM. The G command in DEBUG is used to jump to the address of the program in ROM and run it. Usually g=c800:5 does the trick, but some controllers have the ROM low level formatting routine at different addresses, so check the documentation, if any. Typically, the user is then presented with a list of defaults, and has the option to change them. The builtin programs are fast, and don't always do a detailed test of the ability of the hard disk to read and write and retain the information. In addition, not all controllers have ROM programs compatible with a particular drive.

The Hard Disk Diagnostics from Kolod Research are a suite of programs to test, optimise and low level format a hard disk. Most home users will survive without the Advanced Hard Disk Diagnostics, but every technician and every organisation with several PCs should have a copy. They

include HTEST, HOPTIMUM and HFORMAT plus some minor utilities.

HTEST allows a previously formatted disk to be checked for bad tracks. HOPTIMUM reformats small areas of the disk with different interleaves from 1 to 25, and shows the data transfer rates that result. Most controller/drive combinations have a particular interleave at which the data transfer rate is best, often up to three times faster than with other interleaves. Finally, HFORMAT will do a controller level format on almost any reasonably common controller/driver pairing. It suggests defaults, including interleave, and allows the user to set alternatives. HFORMAT does take a lot of time, an hour or so for a 20 Mbyte drive and proportionally longer for larger drives, but it does format and test each track a default 32 times.

After this, there is a very good chance that all bad tracks have been found and marked.

After this, there is a very good chance that all bad tracks have been found and marked. Being able to low-level format when the ROM address is unknown is an added bonus.

FDISK is now used to define different areas of a physical drive as a different logical drive. In drives up to 32 Mbyte with PC DOS 3.3, it is possible to have a single partition. After that, additional partitions are required, each of which has a maximum of 32 Mbytes. One partition must be marked as the active DOS partition with FDISK if the system is to boot from the hard disk, as otherwise the PC will look at the hard disk when booting and go back to the floppy to load DOS. When FDISK is finished, use FORMAT to format each partition and finally make each logical disk ready to use. Just remember to put the system files into the active partition by adding the /s switch to get FORMAT /S.

Suppliers

Norton Utilities and Norton Editor are distributed by PC Extras, (02) 319 2155. XTree, XTree Pro and Advanced Hard Disk Diagnostics are distributed by Software Wholesalers of Australia, (02) 957 6686. DEBUG, FORMAT and FDISK are on your master DOS disk. WHIZ is available on many bulletin boards. □

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THE FORTH COLUMN

This column is the result of a long relationship between myself, *Your Computer* and the Forth language. We all hope that it will appear regularly, but its success will largely depend on input from readers (both in terms of letters and contributions). The 'prime mover' for this column was the outstandingly successful 'First Australian Forth Conference', which was organised by myself and several other dedicated Forth enthusiasts.

The concept of the conference was very much a 'let's dangle a bait and see what bites' type of approach. There are obviously a lot of other dedicated Forth enthusiasts out there, who all thought that they were working in isolation. If nothing else, the conference provided a venue for these people to meet, exchange ideas and addresses and listen to a wide variety of presentations. Abstracts of several of these will be included in the next issue.

Charles Moore introduced us to the world's smallest computer, which he has built in his new company called Computer Cowboys. The computer is called Campfire (what else would Computer Cowboys spend long hours staring into?) and operates from a three-key keypad. The speed with which Charles navigated around his source screens (editing them on the fly), left no doubt that three keys can be made to work quite well. Moore plans to decrease the size of his computer even further, by getting rid of the circuit board altogether and directly wiring the pins of each chip. Due to the exceedingly low chip count of his computers (Campfire has only 10 chips), this should be fairly easy. Moore is also a proponent for doing *everything* in software (including all the video control).

The virtue of doing things this way (aside from the sheer mental stimulation) is that modifications to accommodate new situations are fairly easy. Chuck demonstrated just how easy, by modifying his video driver software to provide a Vertical Sync pulse for the 94 cm Mitsubishi monitor lent to the conference by Mitsubishi Electric.

Even at a cost of \$12,500, these monitors are worth every cent. The clarity of the display is incredible, even in a large hall. It was a case of the world's smallest computer driving the world's largest monitor. The Campfire was totally invisible sitting on top of this huge CRT. Incidentally, Charles Moore's original reason for inventing Forth was the clumsiness of early

THE FORTH COLUMN

Fortran compilers. The one he was using generated a dump of the assembly code produced by the compiler to a card deck. Moore started going through this deck and found a large number of instructions like MOV A,A which were generated by the compiler. These superfluous instructions amounted to some 30 per cent of the total code and Moore was able to throw these cards away (the *whole* 30 per cent) and *still*

Forth word

In each column, I will explain the operation of one or more Forth 'words' for newcomers, together with their construction from pre-existing words – the first of these words are those that directly operate on numbers on the stack: SWAP, DUP, OVER and ROT. Remember, Forth is case sensitive and these words must be spelt in capitals.

One of the most advantageous features of Forth is its use of the stack. In conventional micros, the programmer must make use of the limited number of registers available on the micro, to pass parameters to subroutines. If the programmer runs out of registers, he must then resort to 'PUSHing' and 'POPping' items from the subroutine return stack. This is both time wasting and dangerous since one too few 'POPs' to correspond with 'n PUSHes' and disaster strikes.

Forth programmers have an almost unlimited stack to play with for passing parameters to routines. The words mentioned above are usually the first that the new Forth programmer wants to use on a regular basis.

SWAP is used to reverse the order of the two items on top of the stack. Suppose the numbers 3 and 4 were the first and second numbers on the stack, then SWAP would simply place 4 on top and 3 second. This is very useful for ensuring that the loop parameters for DO...LOOP's are in the correct order.

DUP duplicates the number on the top of the stack and places the copy in the second position. It's useful for squaring numbers; for example, 3 DUP * would leave the number 9 on top of the stack.

OVER takes the second number on the stack and copies it to the top position. Thus, the depth of the stack has grown by one. If the number 3 is on the top and the number 4 is in second position, OVER will put 4 on the top, 3 in second position and 4 in third position.

ROT means 'Rotate' and the top three stack items are rotated. If the numbers 1, 2 and 3 were the three top stack items, then after ROT, the order would be 3, 1 and 2.



successfully run his program! He started thinking then, that there must be a better way of designing compilers and the first glimmerings of Forth were started.

Another interesting facet of the conference was the contribution by Elizabeth Rather (President of Forth Incorporated and the second Forth programmer in the world) at the conference dinner. She and Charles had many interesting anecdotes to relate, not the least of which are the problems being experienced with Novix (the firm, not the chip). A solution to these problems is well in hand, as Harris Semiconductor have entered the Forth chip field with the introduction of the RTX-2000. This chip looks like being the equivalent of the long promised (and never coming) Novix NC-6016. Maestro look like using this chip in the next model of its SuperComputer (for a review of this 4 MIP wonder, see YC, November '87).

A users' group for Maestro SuperComputer owners has been formed. The users' group will also cater to the interests of people who buy the Super8 based controller kit from Maestro. For those still not 'in the know', Maestro has developed a complete, programmable (in Forth of course) controller kit based on the Super8 chip for the cost of \$120. For those who wish to have a ready made controller application demonstrated, the board expands to a V.21, V.22, V.23 and V.22bis modem (at an extra cost of \$229, or owners can do it themselves). Unfortunately, the board

*The computer is called
Campfire (what else
would Computer
Cowboys spend long
hours staring into?)
and operates from
a three-key keypad.*

can't be used for both applications (a stand alone controller and a modem) at the same time.

For those persons who would like to join the Maestro Users' Group, the address is: *Keith Lane, PO Box 74, Boronia 3155 Victoria.*

The next exciting application for the SuperComputer looks like being a multi-module logic analyser that can be constructed (and used) in economical stages. This would use the SuperComputer as the front end processor and either a monitor or an LCD as a display medium. If any readers are interested in this concept, write to me care of *Your Computer*. We would also welcome any ideas from readers who have perceived a 'missing link' in the electronics world and would like to see their idea implemented in hardware. □

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YOUR APPLE

AppleWorks

Appleworks users will be pleased to know that at long last Claris has made a move on a 16-bit version for the GS — not, as you would expect, by writing one itself (or getting Rupert Lissner to write it), but by buying out Styleware.

Styleware, you will remember, has written GSWorks. From all reports, is a marvelous extension of the AppleWorks concept that maintains compatibility, and similarity in everything else that matters, with the mother program. It has the look and feel of AppleWorks so I'm told, so Claris might have purchased the company cheaply under threat of a similar lawsuit to the one Apple is laying on Hewlett-Packard and Microsoft.

Claris' new AppleWorks GS will be 'out shortly'. It is touching up the interface, and generally cleaning the program up for release at the present moment. Beta versions are floating around, but I haven't been able to get my hands on one at present.

While I'm on the subject: one of the most frustrating things about the present AppleWorks (which remains my favourite program, nevertheless) is the number of times I seem to get data disk errors. If you're an AppleWorks user, you'll know the screen message in Figure 1 well — it'll be burned deep into your subconscious!

I am pretty rough on disks, I admit, and for a considerable period of time I've assumed that this problem was due to physical corruption of the disk surface. I tend to leave them lying around, unenveloped, on the desk, or (horror of horrors) overnight jammed in the disk drive with the lid down.

I have never questioned the assumption that I had scratched directory tracks in some way, destroying access to the information. Fortunately, the way I cycle my working disk means that I automatically have backups in most cases, so the problems have been more irritating than catastrophic. But I hang my head in shame at not having looked into the problem more deeply. A few simple tests would have revealed the cause of the problems.

A solution

Constantly I get calls from AppleWorks users who have suffered first-order disasters with the loss of essential files — invariably it is this directory problem. Usually, my best advice has been to tell them to



hunt out a hacker with a bit-modification program like Pro-Byter, and get him to restore the directory. On reflection, I've been over complicated with my advice.

It appears that the problems are rarely those of physical damage to the disk; rather they seem to lie with the AppleWorks program itself. John Manmutil has pointed this out in a recent article in the Sydney Apple Users magazine, *Applications* (July, '88).

When you ask AppleWorks to save a file to disk, it first of all, creates a directory listing under the name APPLEWORKS-TEMP. Your file is then saved to disk under this name, and only after the save has been successful, does the operating system rename AppleWorks.Temp to the name that you have selected.

This is important, and the process is actually part of the ProDOS operating system rather than AppleWorks itself. The new file doesn't overwrite the space occupied by the old — so if you are making changes to an existing file, both the old and the new remain on the disk. In order to avoid confusion, the new file goes under this APPLEWORKS-TEMP name until the Save is complete, and then the old file is disconnected from its directory listing by a change to the disk byte preceding the name.

It is for this reason that you can cancel a Save, almost until the last moment, by hitting the Escape key. If you do hit Escape, the new directory listing APPLEWORKS-TEMP is 'decommissioned' by disconnecting it from that part of the file that has

```

AppleWorks files
-----

Getting errors trying to read
directory at Disk 2

1. Try again

2. Try a different location
    
```

Figure 1. A data disk error message from AppleWorks.

already been written to disk, and the disk map doesn't record that these blocks are in use. And since the old file and the old directory listing still remain on the disk, the old file is totally recovered.

But something appears to go wrong with this procedure on occasions, and you might find that your attempt to resave a file on an almost-full disk is what is causing the problems. I thought for a while that all my problems were caused by the program aborting a Save itself (due to insufficient room on the disk), but I've got a couple of problem disks that are holding only a few small files each – so this is not the whole answer.

I can't give you a total explanation as to why this problem exists, but I can give you a partial solution – which is better!

First of all, quit out of AppleWorks (storing anything left on the desktop onto a different disk, of course). Then write-protect your faulty data disk with a stick-on tab – just to be sure.

Load up your ProDos User's Disk (the Apple System Utilities disk), enter BASIC,

and use either the CATALOG or the CATALOG, D2 (for disk drive 2) command to look at the directory. The fact that you can now see a directory listing shows that the problem is in AppleWorks' inability to read the directory, and not at the ProDOS level – so if you can read a directory this way, then you should be able to recover the disk contents.

The BASIC catalog command is better than using the menu Catalog selection on the Utilities disk because the BASIC command gives you block size details, and so on. You can distinguish between large and small files, and so on. You can also delete unwanted files, if you want.

If you find an APPLEWORKS.TEMP file listed in the directory then here is your trouble; it should have been renamed or destroyed. Something has gone wrong with the system, and the TEMP file hasn't been renamed, and this is stuffing up the program in some way.

Incidentally, you can now see why it is unwise to use APPLEWORKS.TEMP for the real name of any file! If you like to live

dangerously, you can simply remove the write-protection tab and issue a 'DELETE APPLEWORKS.TEMP' command, and that may fix the problem.

Another way

A better way is to copy all the files you want to preserve over to a newly formatted disk, one at a time. This copying process will rebuild the directory to AppleWork's satisfaction, even when the problem isn't a residual APPLEWORKS.TEMP file. In 90 per cent of cases, I've managed to recover all my old files that I had supposed lost forever.

When you are cataloguing, remember to take note of the volume name (which must be preceded with a / backslash) and carefully record the names of all files in the directory. When copying, you must use a backslash separator between the volume name and the file name to create the pathname.

Use the copy selection from the File menu – not from the Volume menu on the utilities disk – and transfer the files one at a time. You don't want to just copy over the blocks of information, you want the new disk to be created afresh from the ground up.

If this process doesn't work, then you probably have no option other than to use a bit-modifying program to laboriously rebuild the directory if the files are worth the effort. The above system has worked very well for me – although it hasn't fixed a couple of my older disks. I don't know what the trouble is with these, and I can't be bothered spending a couple of days with Pro-Byter finding out. □

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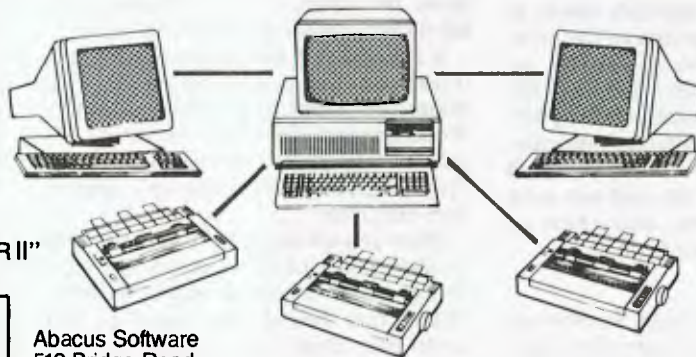
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YOUR APPLE IIGS



Over the last six months GS Users has made some great leaps forward and we've recently made some changes within the organisation. On request from the American National GS Users, the group's name will now be The Australian GS Users Group. The group released the first of its Newsletter Diskettes, written under ProDos 16. (This 800 kilobyte disk had only 7 Kbyte on the disk not used, putting it far head of most commercial software that is available for the GS!)

GS Users will be setting up an Australian National GS BBS under the GS Operating System, with direct input from the USA – we should see this in operation before the end of this year.

In protest to Apple's commitment to the Mac, only three GS developers turned up at the Apple Development Conference in June held in the Blue Mountains. Apple apparently took note of the protest and is starting to reshape its act as far as the IIGS is concerned.

Figure 1. If you're thinking of investing in memory hungry programs like Paintworks Gold (which needs 1.25 megabytes of Ram), be warned: the cost of 1 Mbyte Ram chips is now almost \$1000, with another rise imminent.

New C Rom

Apple has now released the new C Rom on the SCSI card. This will make it possible for you to connect a number of GSs to one printer, or a number of printers to one GS. Apple recommends the use of a Mac as the File Server.

There are many rumours and counter rumours going around about the new GS and the new GS operating system, but Apple's policy is still the same: remain tight-lipped until release day, which will be at Apple Fest in early September in San Francisco. GSOS will most likely come on more than one disk, so you can make your own master driver.

On July 20, a GS Awareness Day was held at Apple Australia's headquarters at

Frenchs Forest, Sydney. Twelve GSs were set up to demonstrate the ability and power of the machine to Apple staff members, most whom had not even seen a GS in operation! Frank Revill reports that even hard case Mac owners agreed the GS was the machine for home use, what with its low price, great sound and colour.

GS users who wish to use Apple Link in Australia: be prepared to put your hand into your hip pocket, and don't blame Apple. The big expense is from Auspac, which charges \$1 per minute, for the use of the satellite communication system.

With the introduction of the new GSOS imminent, most distributors are holding back new releases for the Apple GS so their latest releases can take advantage of this new operating system.

Alien Mind

This is the first of a new breed of programs being released for the Apple GS, written under its own disk operating system, not using any of the Apple Guide lines for programming the GS. On the disk this system is called ProDOS so the ROMs will recognise it. In fact, only 10 Kbyte appears on the disk when the Finder is used. The computer must be turned off so the new operating system can be loaded. One advantage of this type of system is its nearly instant loading ability, when compared to the long drawn out loading of ProDOS 16. The biggest problem is that you cannot make a backup copy without third party software; Micron Software's Shadow Copy is the only program at this stage capable of making a backup copy of such a disk.

Alien Mind is a true arcade game and of the highest quality I have yet seen for the GS. The story behind Alien Mind – It is now 500 years after man has entered the space age, and most Earthlings have left Earth. Food is the most pressing problem and strange eggs have been found that give clues to solve this problem – but one of the eggs has hatched into an alien. Only yourself and a friend are left alive – you must kill or learn the secrets of this alien.

Graphics and sound in this program are very high even by CG standards, proving that software writers are starting to come together with the writing of GS programs.

Defender of the Crown

This is the first of the new software to be released for the GS by Cinemaware, and after previewing this program I feel this company will find itself very popular with GS Owners (the IBM version was reviewed by Gregor Stronach in the August issue of YC). Unlike other programs for the GS, Defender of the Crown starts off from Finder which is contained on its own disk.

The King of England returns from the Holy Crusades, and calls his Knights together for one last gathering. On choosing the Knight you wish to represent, you then go forth and build an army and fight to save the country from the villains of the game. Like Alien Mind, the graphics show a great improvement on earlier GS games and the sounds are of a high quality.

At the time of writing, the only source for the above two programs was through GS Users Sales. YPA, the Australian Distributor of Cinemaware, told me it will not be available through them till November of this year.



Figure 2. Shadow Copy Version 1.2 has now been released with plenty of added features (sorry I didn't have it in time to photograph – that's 1.0 on the screen). Micron Software, the publisher, would like to apologise for the delay in getting copies out to GS owners, but they had no idea how popular this product would be. Version 2.0 is already on the drawing board – if you have a program that is not on its listing, send an original copy to Micron and they will add it to the next release; if they don't have that program already, you'll receive a free update.

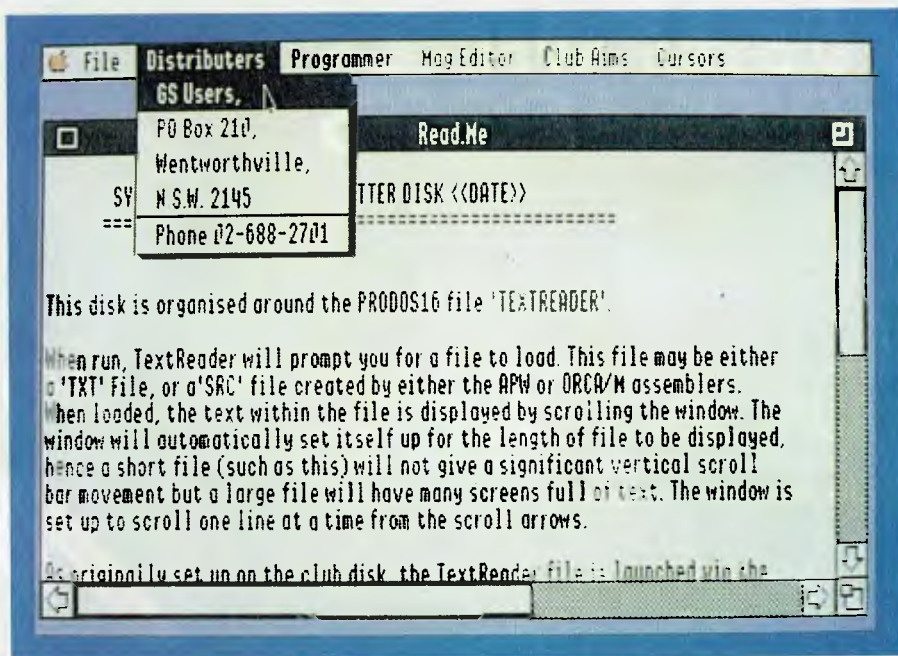
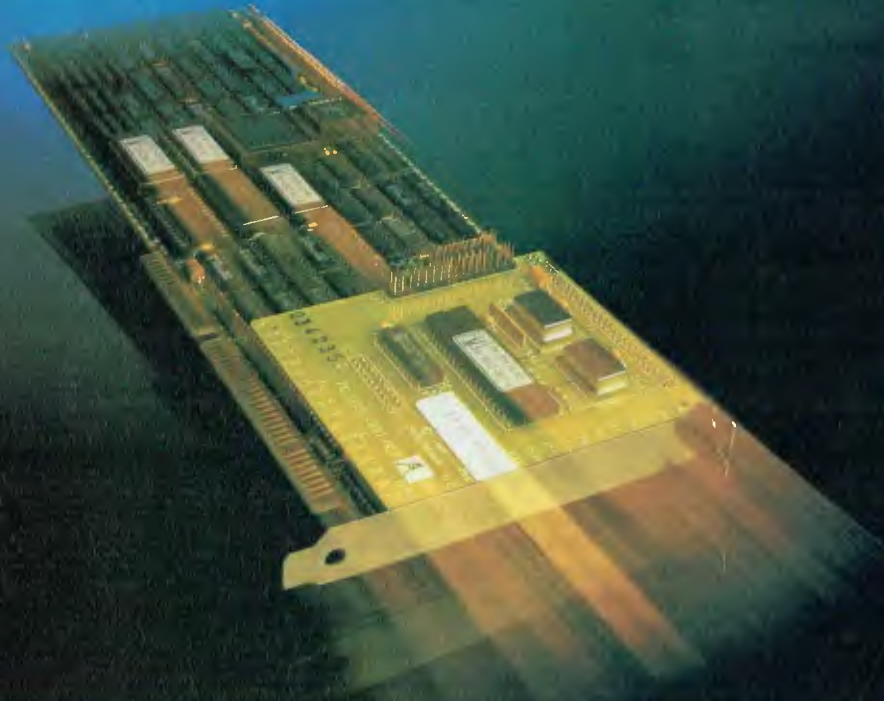


Figure 3. The Australian Apple GS User Group has released the first of its Newsletter Diskettes, written under ProDOS 16. An Australian National GS BBS, with direct input from the USA should be in operation before the end of this year.

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Thexder

One game that has become an instant success on the GS is Thexder – those who have played it will know how frustrating the game becomes. Although the game talks about having 16 levels, most users never get past level 2 before their shields are destroyed, and the game has ended. Well, I have come up with a way to defeat Thexder and have now played right through the game three times.

This patch changes the game so your weapons and shields stay up longer (make a copy; *do not* patch the original) –

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Bsave Thexder, A\$1000, L\$1, B\$5220, T\$B3

I must be the first person to have played all 16 levels, and now it's your turn to join the invincible!

I have had quite a few inquiries about desktop publishing programs over the last few weeks; the word is *Beware!* There are a few products being sold around town that are not what they say they are. For example, Springboard Publisher is not a true IIGS program; it can run on the IIe, IIc and the IIGS with 128 Kbyte Ram. Publish It is another – this is an Apple II program, not a IIGS program.

Milliken Software has released a IIGS publishing program called Medley. It's the only true IIGS desktop publishing program I've seen to date.

Earlier this year I warned users to grab megabyte RAM boards quickly if they wanted one. Since then these boards have increased in price by nearly 100 per cent, which means you won't get much change out of a \$1000. And, they are about to go up again. With the worldwide shortage of RAM chips, we have been warned that an increase of about another 20 per cent is just around the corner. The bad news is that a GS with less than 1.5 Meg on board has now become nothing more than a super IIe. Seven out of ten products for the GS I have looked at recently needed a 1 Meg Ram board to operate. Some of the better packages such as Paintworks Gold, require 1.25 Mbyte and upwards.

Can't say we didn't warn you!

Apple Care

I received a very interesting letter written to me by a GS owner in regards to the Apple Care system, and I thought you might like to read it –

'I have had my IIGS for almost a year

now – a very satisfying year – during which I have had no cause for complaint. But with the closing of this first year came the arrival of Apple's AppleCare folder with a covering letter advising that my computer would soon be out of Warranty and that I would be advised to join AppleCare's 'comprehensive low cost insurance program.'

Further reading yielded the fact that this 'low cost' insurance was going to cost me \$402 for 12 months coverage. My first reaction was that it cost me less to insure my car!

This led me to do a little investigating. The purchase price of my IIGS complete with two disk drives, monitor and an ImageWriter II was approximately \$4600. The market value of my car when I last paid my insurance, was approximately \$6000. It cost me \$192 to insure my car. Less than half of the cost of Applecare insurance.'

Now, according to this same letter: 'Apple hardware is extremely reliable. Breakdowns are few and far between, and it seems very unlikely that within twelve months these pieces of hardware are going to suffer failure to the tune of more than \$402.

My car is out on the road every day. The risk of damage would have to be far greater. If it were involved in an accident, the cost of repairs would certainly be high. Yet, I can insure it at half the cost of insurance for repairs to my computer.

I don't know how other Apple owners feel about this. Me? I'm going to take the chance.' – Vivienne Downey

Apple Australia's reply –

'A company like the NRMA or GIO works on the principal that nearly every person over 18 years owns a motor vehicle, giving them a market far exceeding those of Apple GS owners, therefore giving them the ability to work out the risk rate at a far less cost per head. Over the last few months, the GS has sold way in excess of what we had expected, therefore increasing the numbers of GSs covered under Apple Care. As the numbers go up, so the premium must come down.' – Apple Australia. □

Hints, tips and ideas!

Got any hints, tips or ideas you'd like to share with other IIGS users? Or maybe you'd like to know more about the Australian Apple IIGS Users Group. If so, write to Terry Cass, PO Box 210, Wentworthville 2145 NSW.

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MICROBEE FILE

MUM, HE'S taken all of the grey bits and I need them! Now he's taken all of the yellow ones, too. How am I supposed to finish this ferris wheel with all of the yellow bits gone?'

'Come on Rob, share with her.'

'Just a minute.'

'Come on, you don't need them all.'

'Yes I do! I need all of these.'

'Casey can surely have a couple ...'

'No. None. I need them all.'

'See, I told you Mum, he's mean. He won't share, and the Lego is supposed to be mine – it was a birthday present after all!'

'She's right Rob ... give your daughter a go.'

And so the story may unfold in a number of suburban and country town backwaters where parent and child clash headlong over who gets to play with the Lego! This all may sound a bit fanciful and out of place, particularly in this computer magazine, but with the advent of Lego Technics and a new package – Microbee Lines from Microbee Systems – there are sure to be battles over who gets to build the conveyor belt and plug it into the household's Microbee.

The idea of hooking up mechanical Lego devices to a microcomputer is not a new one. Lego Lines has been available on Apple and BBC micros for at least two years. Microbee has entered the race just a little late, but the wait has certainly been worthwhile. The software is top rate and the price is right.

Three dimensional computing

What Microbee Lines allows you to do is enter the fascinating world of three dimensional computing. It's real back to basics stuff, and is the cure-all for those who see computers as nothing more than glorified typewriters. In essence, Microbee Lines and the associated paraphernalia allows you to control devices such as conveyor belts, sliding doors and traffic lights, which are scaled down versions of equipment used in factories, in shopping centres and on our roads. The principles behind the computer control of such devices remains the same, irrespective of the size of the device. No wonder the people at Microbee were keen to impress upon me that Microbee Lines not only has a future in the Primary and Secondary class-



Figure 1. Children from 8 years old can create, build and program all sorts of technology. Some examples include automatic robot arms and sorting conveyor belts.

rooms, it is also destined to become an important part of TAFE curricula.

In essence, Microbee Lines is a programming language. When you get to the absolute roots of computing, it is all about turning bits on or off. It is hard to grasp that word processors, spreadsheets – in fact all computer output has the same genesis – all are a mass of bits being turned on and off at breakneck speed (but of course in different configurations). Microbee Lines comes in at this point – the computer program controls the devices attached to it by turning bits on or off. It makes motors turn and opto-sensors detect.

What you need to get yourself up and running is the following: the Microbee Lines package, which includes a manual, the Microbee Lines software and an interface board and cable. This all comes to the grand total of \$150. From Lego you need to purchase the 9750 Interface and Transformer for \$250. With your spare change

(or next month's rent) you can indulge yourself and buy one or several of the Lego Technics packages from Lego itself, or from your local toy store. These packages are not cheap, but both the quality and durability are outstanding.

The financial outlay may be a bit daunting, however you may find cold comfort in the fact that the basic outfitting cost for a Microbee (before the Technics packages) is \$400. This compares favourably with \$568 for Apple and \$505 for BBC. The good news is that Microbee Lines will run on any disk based Microbee – from the Standard, through to the Premium and, of course, the 256TC.

Discovery learning

The wonderful thing about Lego and the Microbee Lines package, is that there is never just one answer to a problem. Right from the beginning, whether the buggy or ferris wheel is constructed, there is room for experimentation and individual ex-

pression. Once into the programming of the attached devices, there is always a number of equally valid solutions as we will see.

So, let's have a look at how the whole Microbee Lines experience fits together. The first task is to construct one of the Technics gadgets. If you are a teacher (primary, secondary or tertiary) and intend to take your class through the whole process as a lesson in discovery learning, it may be worthwhile setting a task which also involves the design of a device as part of the solution. For example, the problem could be to design a boom gate which levers up and down to allow opposing flows of traffic to pass, or a fairground ride which lifts people safely above the fairground. Design can initially take place using pen and paper. Materials may then be selected and the design implemented.

In my case, time was a deciding factor for this review. I was presented with an already assembled buggy complete with two motors to drive the two main wheels, with a pivot wheel located centrally at the rear.

Where to next? Ensuring that the Microbee is plugged into the Lego Interface and everything is connected to power, two connecting cables join each of the buggy's motors to the Interface Board.

The software is fired up. Unfortunately, the software as supplied cannot be booted by itself and does not have a Shell. This is slightly annoying, but the manual advises you that the programs for running Microbee Lines should be copied onto an already initialised disk and that the Microbee Lines original should be archived for safe keeping. There are three versions of Lines on the distribution disk – one for each of the Standard, Premium and 256TC machines. You need to copy the appropriate one for your set-up (including the corresponding .OVR file) and all of the exemplary .LIN files. There are no differences in the output from each of the three versions, but all had to be written to cope with the different ways the three keyboards are scanned for input. For convenience, the diskette may be set-up to auto-boot into Microbee Lines.

Once into the program, the title screen is displayed for a few seconds and then the working screen is presented. This is where it all comes together and we begin to understand the reason behind the name 'Lines' – see Figure 1.

When the program is first fired up, a file UNTITLED.LIN is created. It is a blank slate awaiting instruction from you, the programming genius. 'Me, program?!' I

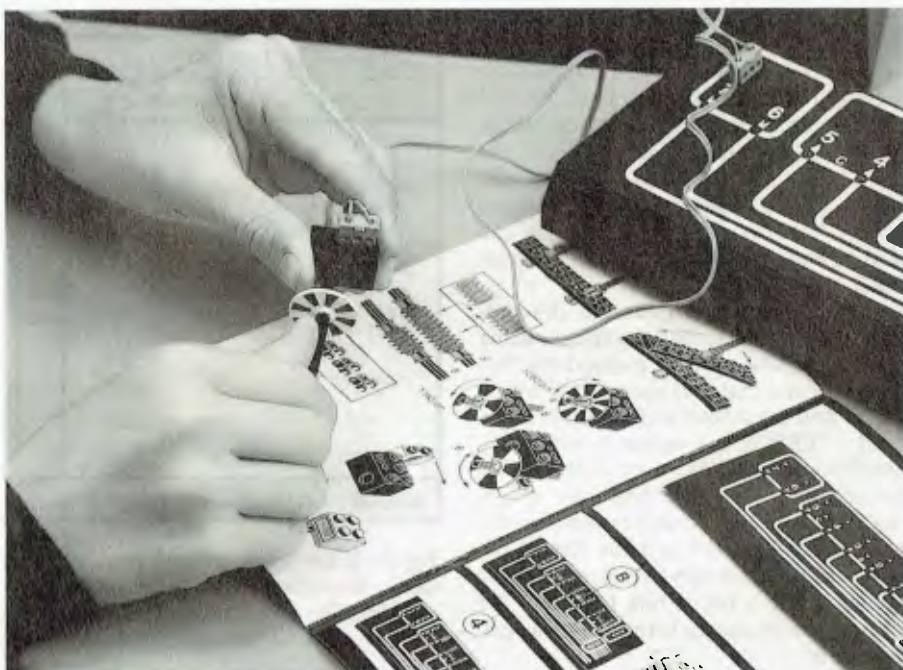


Figure 2. The shaft encoder (the circular disc shown above) works with opto sensors built into models. It allows for more accurate position control.

hear you shriek in disbelief. Beginners take heart: because Lines is so basic in its concept and execution, it is the great leveler. There are no peeks and pokes and fancy jargon to follow. In fact, with the exception of a small set of keywords, you can use your own terms for operations. As long as the words you use make sense to you, all is fine. You may choose to label a forward motion 'up' or 'north' or 'go up' and so on. The opposite motion may therefore be 'down', 'south' or 'come back'. You see, the program takes no notice of what your comments are (except if they are keywords) – it works on the information you put into the bit pattern or map.

The task set for me was to make the buggy trace a square on the table. Easy! The connectors were set across bits 0 and 1 for the right hand motor and across bits 2 and 3 for the left. I entered Edit mode and was positioned in the keyword/label column where I entered my instruction 'forward'. Because the connector was bridged across two bits, each motor had the capacity to move in two different directions.

Therefore, to get it to go forward I had to work out which bits needed to be turned on. There was no other course but trial and error. I turned on bits 0 and 3 by pressing the function keys 10 and 3 (these

are the toggles for the 256TC – F10 being used for 0 because there is no F0). I pressed the Line Feed key to test what I had done. The buggy whirred into motion, but to the left and not ahead as I had guessed. I turned bit 3 off (F3) and bit two on (F2) and tested the line again. Bingo, it moved forward! To make it perform this movement independently, I had to define the time it should move for. I entered 2 for two seconds (and as soon as I had done so, the program assumed that it was information for the Time/Count column and placed it there).

Next I needed to make the buggy turn 90 degrees either left or right. I took my cue from the previous experience, moved to the second line of the program (by pressing Return), labelled the operation 'turn left', turned on bits 0 and 3 and tested the line. The buggy turned left. How long should the motor run to execute a turn of 90 degrees? More guessing and trialling proved that 0.4 seconds was about right. How else could I have achieved a 90 degree turn? There are two other options – either turn one motor on forwards (F10) or turn the other motor on backwards (F3).

My next option was to either enter these lines another three times, or call on one of the keywords – REPEAT. I went to the top of the program (using the old

favourite WordStar/Simply Write macro cursor move Control R) and inserted a line (Control N). Here I typed the word 'repeat' and the number 4 (for the four sides of the square). As soon as I pressed Return, the word I had just typed was thrown into capital letters. This is a special tagging system for key words which makes the reading and understanding of the program much easier.

Lines allows you to execute the program you have just created without having to leave editing mode. I pressed the Tab key to do just that and was alerted with a 'beep' and presented with an error statement - 'ERROR 6 - repeat n needs EN-DREPEAT'. So it did! I went to the end of the program, promptly typed in 'endrepeat' pressed Return, and tested the program. It worked and actually traced out what was near enough to a square (there needed to be a bit of fine tuning to the time for the 90 degree turn), but I was getting there.

As the program ran and the buggy careered across the desk (well, almost), the screen counted the number of times it had completed the loop and displayed the number at the bottom of the Time/Count column. Four on-screen options also became available at the bottom right of the screen, allowing me to halt, pause, test and run the program.

I used four out of the possible six output lines. Two other lines are available, but these are for input. Devices such as opto-sensors and counting wheels are hooked up to these and bring into play conditional statements. For example you may have a situation where it is necessary to detect moving traffic for a doorway to be opened (as is the case in most large shopping centres). The Microbee Lines program would need to incorporate information to the effect that 'if the light beam is broken, then open the door'.

If you have the backing of Bond, up to 48 devices may be connected to the outputs at any one time using a piggy back system. But be warned, all devices connected to bit 0 will do their thing when 0 is turned on. This is otherwise known as chaos!

Strengths and weaknesses

The whole system is very easy and enjoyable to use. The software is well written and thought out. The system of menus which is at its core, ensures that the user is never more than an Escape key away from getting to back to known territory. The use of the 'standard' WordStar/Sim-

Current file A0:WINDMILL.LIN	IN		OUT						Line 1
Keywords or Labels	7	6	5	4	3	2	1	0	Time/Count
REPEAT									
motor			0	0	0	0	1	0	
COUNT	1								15
motoroff			0	0	0	0	0	0	.5
motorreversed			0	0	0	0	0	1	
COUNT	1								20
motor			1	0	0	0	0	0	1
motoroff			0	0	0	0	0	0	.5
motor			0	1	0	0	0	0	1
FOREVER									

Figure 3. The working screen from Microbee lines: the first column contains keywords or labels, the second indicates the set bit pattern and the last is for timing and counting motions. The programming language is very simple and the editing commands will be familiar to WordStar and Simply Write users.

ply Write movement and editing control commands will see first time users familiar with those programs, whizzing around the screen in a trice. The error messages are clear and give enough information on screen for even the most novice of users to be able to rectify the problem without having to refer to the manual.

Ah, the manual! It is indeed a pity to see such a downturn in the quality of documentation, just when Microbee owners were getting used to good quality, well illustrated manuals, the likes of which accompanied the 256TC. OK - so most of the information is probably there, but it is bland and is not supported by pictures, screen representations or diagrams. The one reference to a screen, a Figure 3.1, was nowhere to be found in the manual. Perhaps by calling it a 'bridging manual' MSL feels that the masses will be placated. I just know that once set in type, it may as well be etched in stone - there will not be a revised edition (I hope to be proven wrong!).

However, all is not lost. The Hunter Region office of the NSW Department of Education has been very busy preparing resource notes for use with Microbee Lines. The three part document includes a 'Hitch-hiker's Guide to Using Lines' for teachers, classroom activities and classroom resources, which is geared mainly toward helping students make remote control units. In true resource style, OHP blackline masters and photocopyable

worksheets are included. Although I haven't sighted the resource notes (they were being printed at the time this column was written), I am assured that it is a valuable aid to getting more out of Microbee Lines. It will be distributed to all 10 Education Department regions throughout NSW, and will also be available for other educators through the Hunter Region office.

Because of the nature of the program and the line by line programming approach, the scarce resource of one computer may be stretched by setting tasks on paper and allowing students to try out their assumptions in turn on the keyboard. This strategy may also be used in the home - you don't get a turn on the computer unless you have documented and researched your design first (that should slow Dad down for a while!).

Microbee and Lego have a real winner with a package that will appeal to the gadget person in us all. Robots and robotic devices have a certain magical quality: they entice child and adult alike to play and experiment. Have a look next time you are at a display or an open day where robotic devices are on view. If you can elbow your way through the crowd, don't be surprised if you find a micro-computer issuing orders to a Lego plotter, kangaroo or conveyor belt. Don't be shocked if you also find Dad and Casey still wrestling over who should have first go! □

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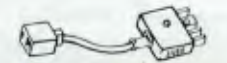
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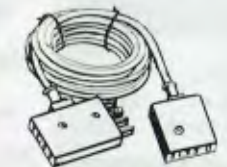


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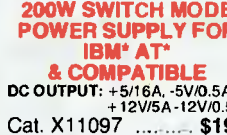
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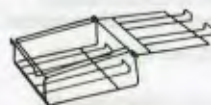
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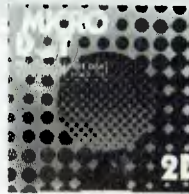
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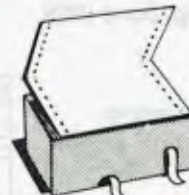
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IBM UNDERGROUND

Looking up postcodes has to be the most frustrating task. It is bad enough when writing a single letter to get the postcode book, or open the back of the phone book, and find a postcode. It is infinitely worse when typing letter after letter, or entering details in a database. Having to look up all those postcodes is a pest. Surely, when typing a letter on a PC based word processor, the machine should look up the postcode.

Getting machine readable postcodes is not hard. Australia Post regularly makes an ASCII file available. Getting convenient access to it while in a program is the problem. Hotcode is the answer. It is a memory resident program which can be popped up from inside another program, and comes with a data file prepared from the Australia Post list, but carefully encoded to save massive amounts of disk space.

When popped up, Hotcode looks to the left of the cursor in the host program and guesses at the name of a town or locality which might be there. It then scans through a data file on disk to find a locality which most closely matches its best guess. With a single key stroke, the user then can insert into the host application at the cursor the locality name and postcode, or just the postcode.

Windows

When Hotcode is popped up, two windows are seen. The larger one is 40 columns by 19 rows (including the borders) and the smaller is 36 columns by 3 rows, again including the borders. Both are popped up away from the cursor in the host program, leaving it still visible.

In the border of the larger window are credits for The Fabric Shop (whose manager wrote the program as a labour of love), along with a reminder of the cursor keys required to scroll the localities and postcodes. In the border of the smaller window is shown the version of the program, the system date, or the system time if Hotcode was loaded with the /t optional parameter on the command line.

Popping up

When Hotcode windows are popped up, the program reads the 32 characters immediately to the left of the cursor in the host program, stopping when it finds the left hand end of the line or the DOS prompt. It strips out spaces and punctuation, and displays the result in the small window. The larger screen shows a list of Australian localities in alphabetical order and their postcodes.

Hotcode then looks through its data file for the locality name which most closely matches the string in the small window. This locality name is shown halfway down the large window in reverse video, with the locality names immediately before and after it in alphabetical order being above and below it. The program tries to make some sense of what it reads, but if it guessed wrong, the user can manually enter a location, or scroll the data file.

Manual entry of the locality name is done by pressing F1 to clear the small window, and then typing in the name. As the letters are entered, Hotcode guesses the possible locality name, and usually only needs three or four letters to home in on it.

Once the desired locality is found, pressing Enter inserts state and postcode at the cursor of the host program, pressing F2 inserts just the postcode, F3 and F4 insert state and postcode, F5 and F6 insert locality, state and postcode. In each case appropri-

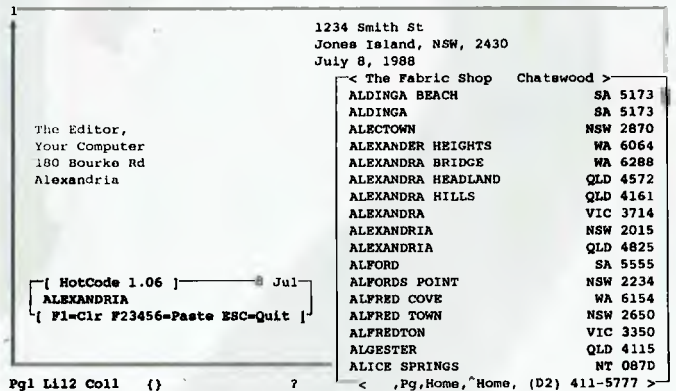


Figure 1. A sample screen of Hotcode running over Microsoft Word. (The author is the manager of the Fabric Shop; he has donated the program to the Public Domain.)

ate punctuation is inserted, and the various function keys offer either all upper case or mixed upper/lower case. To help the user know how far they are through the data file, a little marker moves up and down the right border of the larger window (the marker can be seen to the right of Aldinga Beach in Figure 1).

Options

Hotcode, as mentioned above, can be loaded from the DOS command line or a batch file with only the command HOTCODE, and the default settings then apply. Alternative configurations are possible, and are invoked by adding one or more switches to the command line. A switch is the slash character /, followed by a letter. The optional command line switches, or parameters, can be mixed in any order, and may or may not be separated by spaces. One or all can be used.

Distribution

Hotcode was written by Peter Butterworth, manager of The Fabric Shop, 308 Victoria Ave, Chatswood, 2067, (02) 411-5777. Hotcode is copyright, but the author allows for the executable, documentation and data files to be used at no charge provided they are not altered in any way. Copies are available from many user groups or bulletin boards.

The cost? A paragraph in the manual says it all. No registration fee is requested of any user. Those who find it of use are invited to make a donation (amount unspecified) to the Salvation Army, and donations sent to the author will be forwarded on to them. Software libraries cannot charge anything for Hotcode, apart from a nominal \$10 for duplicating and distributing copies.

Hotcode is a program which takes me back to the early days of the PC, and yet leaves me firmly in the present. Sharing the fruits of one's efforts free of charge is very much in the spirit of the pioneer users of the PC, and is often lacking amongst the current users. In performance the program is very much of the present. It functions as cleanly and professionally as one could hope for, and is far better than many commercial competitors. □

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Image Scanner

Digitisers are extremely useful devices; they provide the means to incorporate pictures with computer generated text. In fact, you cannot seriously consider entering the realms of desktop publishing (DTP) unless you have a digitiser. But — a digitiser that will allow you to include those in-the-field photographs or hand-drawn graphs can easily cost you in excess of \$2000. But thankfully, a new product just released may be the answer to your prayers.

Seymour-Radix has just released its Image Scanner for the Atari ST; priced at only \$199 it is sure to attract a large share of the digitiser market.

The Image Scanner includes both hardware and software. The hardware uses fibre optic technology and consists of a light conducting fibre that attaches to the head of a printer (preferably Epson compatible), terminating at a circuit board which plugs into the cartridge port.

The software controls such factors as grey scale adjustment, enlargement and reduction of image, and saving and loading routines. Images may be saved in either Degas or Neochrome format, or as raw data for further refinements at a later stage. Images created with the Image Scanner can be used in programs such as Publishing Partner, or even loaded into Spectrum 512 for enhancement using that program's advanced features.

A utility program is also included on the disk which will convert saved raw data into a format that may be used with a Public Domain program called Aim. This is a program that serves to improve the clarity, extract features and add special effects to images. There is also a PostScript conversion file which will generate output suitable for PostScript laser printers.

The results obtained from Image Scanner are acceptable rather than outstanding. However, when the low cost is taken into consideration, it should prove to be a very popular product with those Atari ST users who want DTP at an affordable price. It will also add an extra dimension for those ST artists who wish to digitise earlier hand-drawn works. All in all, the Image Scanner provides an economical means of digitising and is well worth its \$199 price tag. (Thanks are due to Tech-Soft Computer Wholesale, Perth, for supplying the review unit.)



Hints and tips

If you have two drives, or you are using a Ram disk, and wish to copy all your files from one disk onto another but don't want to erase any files from your destination disk (as would happen by dragging Icon A over Icon B) try the following.

Open the window of your destination disk and drag the source disk icon into

that window. All the files will be copied across. This is very useful when you have more files to transfer than can be displayed in an open window. It also alleviates the need to move through the directory lassoing files either one at a time or in groups.

Page layout

Starting a new document with Publishing Partner can involve creating a new layout. This can be a difficult task if you are unsure of the column widths, space between columns and so on, that are required for your pages. One easy way of overcoming these difficulties is to purchase a large sheet of graph paper from your local stationary store (the paper with centimetre squares is best) and use this paper to map out your layout before you start. You will find that you will save time, have fewer headaches, and end up with a more professional result by taking a few minutes to prepare your work.

Directory update

If you need to check the contents of several disks, you don't need to keep opening and closing windows. Place the first disk to be checked in the drive and double-click on Icon A. To view the contents of a subsequent disk, just place it in the drive (after removing the previous one and having left the window open) and hit the escape key. The window will refresh and display the new directory.

Cover that computer!

Remember, dust is the enemy of your machine. Always keep your keyboard covered to avoid dust build-up and the resulting key bounce (keys failing to register). Do not use plastic covers as condensation may cause damage and do not use any substance which might drop lint into the keyboard. Anti-static nylon covers are the best and these are available from most computer stores.

Don't lose data

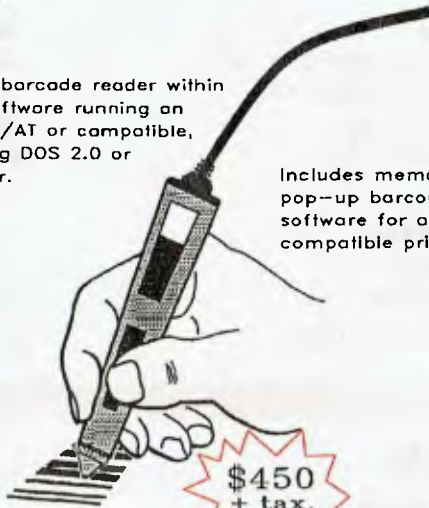
Keep your valuable disks well away from sources of magnetic fields. Placing them near such things as monitors, fridges, televisions and so on, can damage them. □

The images accompanying this article were reproduced using Image Scanner.



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Do you need to incorporate serial communications into your applications? Yes! Then get this inexpensive but highly professional COMMS toolkit from Zortech Inc. Look at the list of features: Xmodem, Kermit and ASCII file transfer, Hayes modem control, VT52, VT100 and ANSI terminal emulation, supports up to 8 serial ports, speeds up to 19.2k baud rate and higher. Two demonstration programs are included, MINICOM and MAXICOM (like Procomm) together with the 120 page manual and full source code FREE!

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YOUR MAC



The law of Exponential Confusion

If I were a collector of Macintosh operating systems, I'd be looking for another filing cabinet to store the documentation that floods into record the improvements, modifications and defects of the various Finder and System versions.

Right from the start Apple divided the Mac operating system into two segments – the System proper, and the Finder. Each of these has a different revision number, followed by a version decimal and a bug-fix indicator.

Each modification gives us minor problems when run with the other part of the operating system, and these minor and major problems are always compounded

by incompatibilities with different versions of many Mac application programs.

There must be about 50,000 different combinations, if you look at the more common of the Mac applications. With this complexity, it isn't long before the law of Exponential Confusion prevails.

Go to an Apple Users meeting, and you'll find that they spend their time swapping advice like 'If you wanted to use ****'s word processor, Version 4.7 with System 5.2, then you can't use Finder 4.56 if you are going to justify columns to less than 45 characters. But Finder 4.67 gives problems with...'

Apple has now released System 6.0 for the Mac, and has decided to do away with the separate numbering of System and Finder and group them together under

one heading. That's not actually the case at present; they've only half implemented the new coding system. The current release of System 6.0 seems to involve the use of Finder 6.1, as far as I can make out. But to add to the confusion, we've now got single Finder and MultiFinder.

For many years, Apple has preached the gospel that if Mac applications are written strictly to Apple guidelines, then compatibility with different versions of the System and Finder software are reasonably assured. Over the last few years, this commandment has become increasingly difficult to maintain as the infallible word of the Apple God. Now its tablets are proving to be carved from clay, not Mt Sinai granite.

Apple publish a list of applications that it has tested for compatibility with System 6.0. This list also includes a warning that many other applications haven't yet been tested – so beware. Apple rate the programs: A = works OK, B = some cosmetic problems, C = minor problems and D = major problems.

Among the more popular Mac programs, MacPaint 2.0 and FileMaker Plus 2.1 get an A rating, while MacDraw 1.9.5, Excel 1.06, Adobe Illustrator 1.1, MacWrite 5.5 and Microsoft Word 3.02 get a B.

In the C category is Microsoft Works 1.1 (with the explanation that it doesn't work with the MultiFinder, but does with Single Finder); Omnis 3+ 3.24 (which was also rated C with System 5.0), PageMaker 2.0a (which doesn't like the macro facility) and Microsoft File 1.05.

The D for disastrous category is the surprise, considering the philosophy of making only subtle changes to the Mac operating system was intended to produce a steady migration path from the original 128 kilobyte Macs to the new Mac II line 'for software that adheres to the guidelines'. MacDraft 1.2a, Excel 1.04 and ResEdit 1.1b3 are listed in this D for disastrous category, as are two programs which were written specifically for the new Mac II family – Fourth Dimension 1.0.4 and dBase Mac 1.0. Something seems to be going horribly wrong.

Now, obviously, all these important programs will be repatched to work with the new system, in time; but by the time most are repatched, System 7.0 will be on the market and the whole process will start all over again. System 6.01 is already in beta release, being tested to solve

many of the problems experienced with 6.0 – so it's hard to know what to do if you try to keep your system current.

Unless you are willing to risk being left behind – frozen in computer time and space – you will feel the need to upgrade systems (and, therefore, often applications) on a reasonably regular basis. Mac users tend to see themselves as the *avante garde* computer users – no one wants to dinosaur label (yet dinosaurs dominated the world for 200 million years!). So the latest system is often important.

The new system

The new system is for 1 megabyte (and up) SEs and IIs, and it includes some interesting new features. MacroMaker lets you create your own key and command sequences which can be called up any time. Many people have bought macro programs from third party vendors in the past, so this addition to the operating system is bound to put a few developer's noses out of joint.

MacroMaker comes on a Utilities disk. You install it into the operating system by copying it into the System Folder, and it becomes a pop-up on the top right of the menu bar. You name the macros you create, and they appear for selection under the MacroMaker menu.

CloseView is also a utility that is installed into the System Folder. It allows you to selectively magnify parts of the Mac screen, but what conceivable use this would be to most people, I'm darned if I know.

Map is on the same utilities disk, and this provides you with a world map giving local times at selected locations in different time zones. The problem with this accessory, like almost every other map/time calculator is that it has no way of taking into account Daylight Saving changes, both here and overseas. You could do better with a paper list that gave you details of when various cities introduce time changes!

All these features, with the possible exception of the macro facility, are executive toys – pink icing to disguise a rather stale cake. System 6.0 isn't for everyone, and most people would be wise to sit back and watch what happens rather than rush in just to get the macro facility.

From Apple's point of view, it is probably necessary to make this change – it's like the old principle of telling people the bad news quickly. To reach its real potential, the new Macs really need an operat-



ing system quite different from the old, and the changeover can't be completely painless.

The direction we are going with the Mac SE and II is towards multitasking – the ability of these machines to process several independent applications concurrently. The infamous Switcher just switched between applications, but only the 'foreground' program functioned. The rest were effectively dead. With Switcher, you couldn't go on writing your memos on MacWrite, while your database was sorting in the background.

MultiFinder allows this to happen. But MultiFinder doesn't necessarily do this properly at the present time – for very good reasons. The introduction of MultiFinder had to be an evolutionary process, not a revolutionary one, and so the programmers didn't have the luxury of being able to design the operating system from the bottom up.

Witness the problems IBM is now having with OS/2. Most of the IBM clone-makers are spending big money publicly damning OS/2 and telling all who will listen that MS-DOS is probably the only operating system most users will ever need. And if this were a rational world, you would have to say that they are quite possibly right!

If you were to take a rational position about computers and operating systems, you could establish a pretty good case for saying that the Apple IIe was all that 95 per cent of users ever needed – in the same way that old Volkswagen Beetles or

FJ Holdens provides all we ever need in a car... if we look on a car as primarily a means of transport.

But in any traffic jam at the Harbour Bridge toll gates you'll still see yuppies in their Ferraris stuttering at a top speed of 5 kph, and on the desks of these same yuppie executives you'll see Mac IIs and SEs... with Excel or MacWrite the only application in sight.

Business status is the key to selling cars and computers, and status is tied to the idea of 'importance'. With Important People, time is so precious that they need Ferraris to travel the ten miles from home, and Mac IIs with multitasking to save a ten second wait while the spreadsheet recalculates. Hence the marketing emphasis on multitasking and MultiFinder.

But we could be on an evolutionary dead end; this might be the computer version of two tone chrome bumper bars and six foot tail fins.

True multitasking operating systems treat all applications equally, according to need. They switch between applications so fast that all appear to be processing simultaneously; and the control of this switching is handled by the system itself.

MultiFinder is a simpler form of multitasking where foreground and background processing are treated separately. The background tasks only grab processing time when the foreground applications is sitting idle. Foreground has priority which superficially, makes a lot of sense, but things aren't always what they seem.

The problems with MultiFinder's ap-

proach is that each application has to be redesigned to tell MultiFinder when it can switch over to service the background mode, so code has to be included in each application to allow it to relinquish control when it is in foreground, and to pick up control and hand it back, when in background.

Applications programs must now have intelligence, and be individually taught to co-operate with others. Which is okay as long as you can trust everybody – and you know *can't*.

Breaking ground rules

With multitasking, it is to each software developer's advantage to break Apple's ground rules by writing code which creates some degree of priority for his or her own application. If you've got three applications up on a Mac – say A, B and C – then it is to A's advantage to hog control of the CPU whenever it can. If Application A can average 66 per cent control of the CPU time instead of 33 per cent, then it will appear to be faster and better, while B and C (from other developers) will appear to be slower and even downright sluggish.

It will also now pay software writers to build in special forms of a cache system where CPU overhead is used to predict and prepare for possible tasks that the application 'might need to do next'. When you are the only program using the CPU, it pays for you to economise on the use of the CPU, so there's a point where cache systems slow the operations down. But this same constraint doesn't apply when you are competing for time with other programs; hog the CPU as much as you can!

For instance, in an extreme case I could imagine a database management program that constantly spends 'idle' time rebuilding indexes. This time, in effect, would be stolen from the other applications running in background, but the user has no way of knowing this. The pay off for the software publisher will be that his or her database manager appears to be lightning-fast in search procedures, while the other co-resident applications will seem to be much slower than they really are.

Overhead loading of this kind could well bog down multitasking once the software writers come under pressure to speed up their programs – and this will inevitably happen when many programs

are sharing the same CPU time. Cache and hogging tricks will provide programmers with quick and dirty solutions, and these solutions will have obvious marketing advantages in terms of 'benchmark' tests.

So, if you are considering a move into multitasking, you'll have to start thinking anew about the applications you are going to use concurrently – and you'll need to find out how each relates to the other. How you will do this without buying the packages first, is anyone's guess. The permutations are just too great.

In practice, you'll probably just buy new versions of what you've already got and put up with conflicts and the inadequacies, which means that multitasking might be more trouble than it is worth. Or, perhaps, it might pay you to buy a second Macintosh and use it to run your CPU-hungry programs, keeping the multitasking computer for the simpler 'standards' and desk accessories.

Or you might decide that the old Vdub was all you ever needed, and just to take a coffee break every time you need to change applications. Who knows? You might save yourself from the dreaded puffy burn-out! □

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CURSORY GLANCE

I found this a little hard to believe until told that it happened about four years ago. Lee was at Uni at the time and wanted a computer, but knew little about them. She walked into a city computer store and asked the salesperson about what hardware the store sold. She was directed to the local tool-type hardware store just down the road. Ah, those were the days.

■ Definitions you need to know: GREENWARE – cash; NEVERWARE – computers sold on hire purchase; OVERWARE – ‘Sorry that sale has finished’; BEWARE – caution is required when purchasing this equipment; HARDWARE – shop which sells a hammer to help with installation; OUTWARE – ‘Sorry the service manager is not in’; UNDERWARE – support for the computer user. On the subject of the hammer I just mentioned, James, one of our technicians, refers to them as ‘linear rectifiers’. Fortunately, I’ve never seen him use one in that way.

■ Some colleagues were lent the latest item from Telecom – a Teletex machine which allowed them to send messages to other Teletex machine owners. No one used it because they couldn’t find any way that it was better than a modem, a fax or a telephone. One day someone checked it out and found that the message buffer was full. ‘Ah, so there is a use,’ they thought – other people are sending us messages. Unfortunately, each message said ‘This is a Telecom test message, please ignore it.’

■ The next time you go to rest one of your precious floppy disks on a copyholder or lampbase, think again. I found some magnetic metal disks on a desk next to a computer and couldn’t work out how they got there. Eventually I found the copyholder base was full of them. They were waste from a factory which punched holes in metal plate about the size of a \$2 coin but twice as thick. The copyholder maker used them to weight the base and make the unit stable.

■ Dainippon has a video system which allows you to try on other people’s hairstyles. The system shoots a view of you, then you choose the hairstyle you wish and it displays the two of you together. Just the thing if you always wanted to know how you’d look as Peter Garrett.



I think it would probably have more commercial application for trying out the Annie Lennox or Farrah Fawcett-Majors looks, but why should women have all the fun? If Dainippon would just extend it to other parts of the body I could try out the Arnold Schwarzenegger look or the Dolly Parton look. Hmm, poses interesting possibilities.

■ My friend Jan was called to the morgue to identify her father. She and her mother were ushered into a room which had a video screen. They waited. After a short time the video lit up with an image of a man’s face. Her mother said, ‘That’s my husband,’ the video went dead and they were ushered out. Jan was left reeling, not having seen her father’s body, not having had a chance to prepare herself for a video image of him, and not having had time to realize what was going on. Not exactly a joyous use of technology in less than pleasant circumstances – the loss of a loved one.

■ Old proverb: Many fingers make keyboard work.

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Michael Burlace is a consultant and trainer with The Clear Group. He may be contacted on (02) 317 5190 or by writing to PO Box 57, Broadway 2007.

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